

gesture

evolution, brain, and linguistic structures

4th conference of the international society for gesture studies · isgs
july 25 – 30, 2010 · european university viadrina frankfurt/oder

abstracts

Acknowledgements

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**Welcome by the President of European University
Viadrina Frankfurt/Oder, Dr. Gunter Pleuger**

Dear Participants of the 4th Conference of the
International Society for Gesture Studies,

I welcome You to the Viadrina, a place that is well
suited for the meeting of brilliant minds: Enjoy
the University's facilities, its location right at the
Oder river and the concentrated atmosphere of
a University right in the heart of Frankfurt/Oder,
a city with a history as diverse as the whole
European continent taken together.

Crossing borders – both physically and intellectually – is an exercise the
Researchers, Students and Staff of the European University Viadrina undertake
on a daily basis. We are blessed with both the atmosphere of a location right
at the border to Poland – a most fascinating neighbor – as well as the proximity
to one of Europe's most vibrant capital cities. Do as we do: Make full use of
the opportunities offered by the Viadrina.

I congratulate the Members of the Scientific Committee, the Program Chairs
and the Organizing Committee for their brilliant work in the run up to the
Conference and I express my gratitude to the supporting organizations,
especially the VolkswagenStiftung and the Deutsche Forschungsgemeinschaft.

I wish You a successful scientific exchange on “Gesture – Evolution, Brain,
and Linguistic Structures”.

Dr. Gunter Pleuger

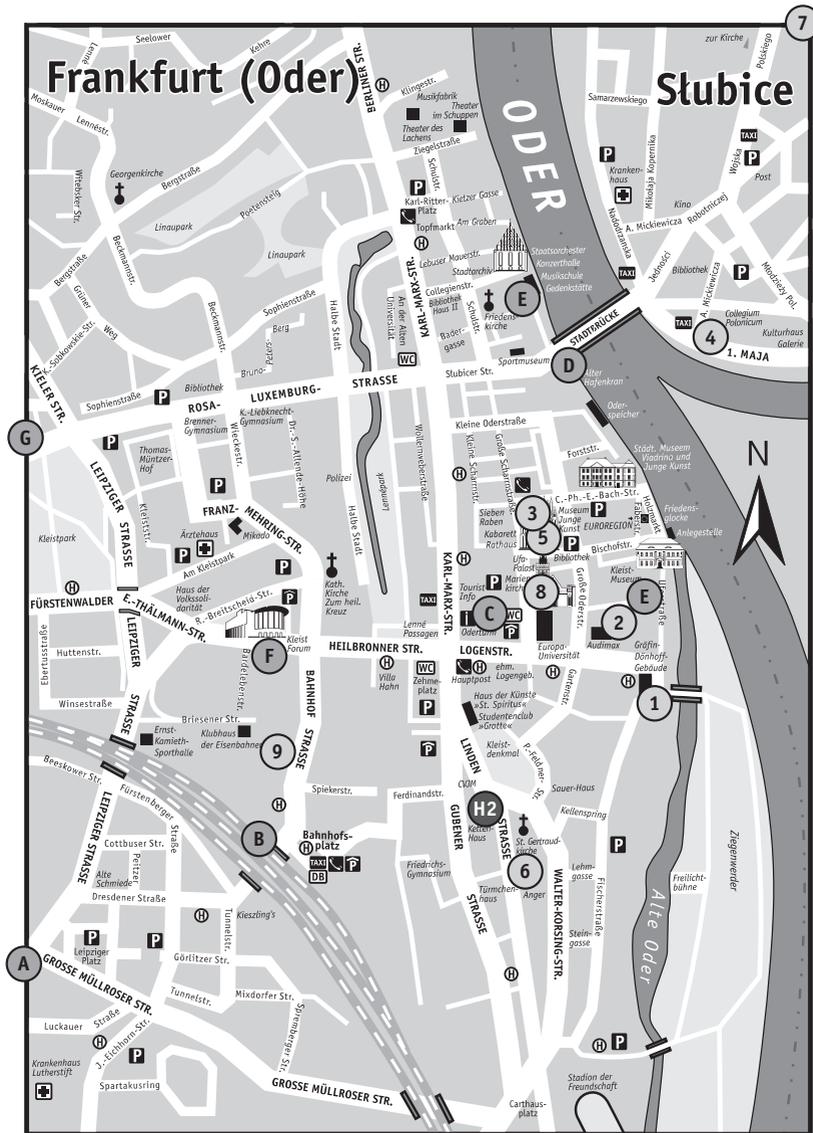


Photo by Heide Fest
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Welcome to the the fourth International Conference for Gesture Studies
by Cornelia Müller on behalf of the ToGoG Team (Towards a Grammar of Gesture)

It is a great pleasure for us to welcome you all at Frankfurt/Oder. In several regards this a 'historical' locus for this meeting. The first steps towards studying gesture from a linguistic and an interactional point of view in Germany were taken in Berlin, Germany in the early 80ties. Jürgen Streeck and a group of his students inspired by Adam Kendon's, David McNeill's, David Efron's and Wilhelm Wundt's thoughts on gesture and language began to collect videomaterial of face-to-face-conversations in various languages and studied "how gesture and speech work together in the process of utterance" (Kendon 1980). In the 90ties Roland Posner at the Technical University Berlin began to work on a "Berlin Dictionary of Everyday Gestures", approaching the conventional side of gestures from a thorough linguistic and semiotic point of view. In 1996 Posner and his group organized a Berlin conference on the Pragmatics and Semantics of Everyday gestures and it was there that Roland Posner proposed to found an international society for gesture studies and a gesture journal. Jürgen Streeck then in 2002 hosted the inaugurating conference of the ISGS in Austin Texas. In the 2000's the Berlin Gesture Project at the Freie Universität Berlin (headed by Cornelia Müller) started to develop a form-based linguistic and sequential-analytical approach to the study of gesture. This work led to the Volkswagen Project "Towards a grammar of gesture: evolution, brain and linguistic structures" (ToGoG), submitted by Cornelia Müller, Ellen Fricke, Hedda Lausberg, and Katja Liebal. The linguistic part of the ToGoG team maintains this tradition: Jana Bressemer, Ellen Fricke, Silva H. Ladewig, Susanne Tag, Sedinha Teßendorf were all members of the Berlin Gesture Project. Ulrike Wrobel has joined us later and brings in sign linguistic expertise to the group. Together with Ellen Fricke and Hedda Lausberg this Berlin spirit of gesture studies led to the foundation of the Berlin Gesture Center – a center to foster interdisciplinary gesture studies. Hosting the fourth ISGS in a linguistic, interactional and cross-disciplinary spirit is a great honor for us and we wish you all inspiring, joyful and exciting talks, exchanges and face-to-face conversations. That this takes place in Frankfurt/Oder, 80 kilometers east of Berlin, right on the river banks of one of the war and post-war borders is something that – when we started gesture studies in Berlin in the 80ies was impossible to imagine. Enjoy your stay – and take a moment to reminisce during a walk along the beautiful riversides.

general information

supported by www.giraffe.de

- 1 Gräfin-Dönhoff-Building/Canteen *Europaplatz 1*
- 2 Auditorium maximum *Logenstrasse 2*
(Screening of A. Rose and dance Rajyashree at the AUDIMAX building)
- 3 Main building/University library *Große Scharnstraße 59*
- 4 Collegium Polonicum *ul. Kościuszki 1*
- 5 Reception at the city hall *August-Bebel-Strasse 12*
- 6 Copy shop *Lindenstraße 16*
- 7 Copy shop *Stubice Pilsudskiego 2 & 7*
- 8 Opening reception at the Marienkirche *Oberkirchplatz 12*
- 9 Conference party: Kamea-Club *Briesener Str. 1*

- H1 City Parkhotel *Lindenstraße*
- A Autobahn exit "Frankfurt (Oder)-Mitte"
Access to City Centre and University
- B Main Station
- C Oderturm *Logenstrasse 8*
- D Bordercrossing *Stadtbrücke Stübicer Straße*
- E Kleist Forum *Platz der Einheit 1*

Copy shops in Frankfurt/Oder*Repro-Center Ahrens*

Gartenstraße 2

Phone: +49 (0) 335 23 977

Open: Monday–Friday, 8 am–5 pm

(around the corner of the Gräfin-Dönhoff-Building)

Kopierfritze

Lindenstraße 16

Phone: +49 (0) 335 22 366

Open: Monday–Friday 8 am–6 pm, Saturday 9 am–1 pm

Copy shops in Słubice*Kutt Małgorzata. Ksero*

Piłsudskiego 2

Phone: +48 957584810

Open: Monday–Friday 8 am–6 pm

Druk

Słowiańska 14

Phone: +48 957582359

Open: Monday–Friday 9 am–4 pm

Important phone numbers**Frankfurt/Oder***Police* 110*Fire Department and Ambulance* 112*TAXI Service* +49 (0) (335) 535005**Słubice***Police* 997*Fire Department* 998*Ambulance* 999*TAXI Service* +48 (95) 7582348

conference information

Committees**Program chairs**

Cornelia Müller (European University Viadrina, Frankfurt/Oder)
 Ellen Fricke (European University Viadrina, Frankfurt/Oder)
 Hedda Lausberg (German Sport University, Cologne)
 Katja Liebal (Freie Universität Berlin)
 Irene Mittelberg (RWTH Aachen University)

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 Susanne Tag
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Eve Sweetser (University of California, Berkeley)
 Virginia Volterra (Institute of Cognitive Sciences and Technologies, Rome)
 Sherman Wilcox (University of New Mexico, Albuquerque)
 Christoph Wulf (Freie Universität Berlin)

The drawings of the hands on the logo of the conference were made by the visual artist Mathias Roloff. For further information see www.mathiasroloff.de.

Registration desk and conference office

You will find the registration desk and the conference office in the Atrium of the Gräfin-Dönhoff-Building. The registration desk and the conference office for registered conference members will be open on:

Sunday: 3 pm–8 pm
Monday through Thursday: 8 am–7 pm
Friday: 8 am–6 pm

If you wish to register on-site or purchase day passes, this will be possible from Sunday to Monday during the regular opening hours of the registration desk. On all other days you will be able to register until noon. If you check in later we will give you a form to fill in, and we will take a copy of your ID, then you will receive your conference items. The payment will be postponed until the registration desk opens the next morning.

Computer room

We have a computer room available where you can check your e-mails and use the internet, if you don't choose to use our Wi-Fi option, which is explained below. The room is in the Audimax Building, Logenstr. 2, room AM 103, close to the Gräfin-Dönhoff-Building. Opening hours will be announced at the conference office.

Wireless LAN (WLAN) / Wi-Fi internet connection during the conference

During the conference you will have access to the internet service provided by the European University Viadrina (EUV). Please note that access is limited to lecture halls, seminar rooms and other public areas of EUV premises and requires the set up of a new Virtual Private Network (VPN) connection. Setting up the connection basically requires only two simple steps – which will be described in detail for all operating systems further down. We will also set up a WLAN (Wi-Fi) help point at the conference office.

1. Configuration of **euv-wlan**: set the name (also called WVN or SSID) to “euv-wlan”, and turn off encryption for this WLAN connection – so no WPA, WEP etc.
2. Configure a new VPN connection with the server name **vpn.euv-ffo.de**, choose **PPTP** if presented with the option, and use the username and password that was given to you at the registration and which you will find on the back of your name tag.

1. Configuration of euv-wlan

WINDOWS XP

If your WLAN-card uses a separate/specific programme for configuring network connections you will need to use that programme and the steps detailed below will not work on your laptop computer.

In all other cases, the following will work: double click on the **Wireless Networks button in your task bar (at the bottom right hand corner)**. Choose **Properties**, then view the **Wireless Networks** tab at the top of the window.

Add a new network, type euv-wlan in the field called **Network Name (SSID)** – or possibly WVN. If presented with an option **select** “Connect even if this network is not broadcasting” and **disable** “Data encryption”. Click **Ok** and you will have successfully configured your WLAN connection and should be able to find it among your **Preferred networks** in the **Wireless Networks** tab of your **Wireless Network Connection Properties**.

WINDOWS VISTA/WINDOWS 7

Windows Vista/Windows 7 does most of the work by itself; you will only need to tell it the name of the “Unnamed Network” it will discover which is: **euv-wlan**. Click **Next**, then choose to **Connect Anyway**, although euv-wlan is an unsecured network. Vista/7 will then test the connectivity and connect to euv-wlan – if the test fails at first, simply try again.

If, for whatever reason, the – in the beginning unnamed and unsecured euv-wlan – is not displayed among the wireless networks, you will need to set the network up manually. This works analogously to XP, the important thing to keep in mind is to disable data encryption.

MAC OS

Click on the **AirPort** symbol in the upper right hand corner of your desktop and choose **Other**. Type the network name **euv-wlan** in the next open window and select **No Wireless Security**. Open your preferred browser (i.e. Safari or Firefox) and enter your username and password.

2. Configuration of your VPN-connection

WINDOWS XP

Open **Network Connections** and select **Create a new connection**. When asked what type of connection you want to set up select **Connect to the network at my workplace**. Next, select **Virtual Private Network (VPN) connection**, then give it a name you will recognise afterwards. If presented with an option select **Do not dial the initial connection**. Next, enter the server name: **vpn.euv-ffo.de**. Finish the installation wizard. At the very most 5 minutes later you will be able to connect to the network you have just created using your username and password.

WINDOWS VISTA/WINDOWS 7

In your **Network and Sharing Center**, click **Connect to a network**, then **Set up a connection or network**. Select **Connect to a workplace**, then **Use my internet connection (VPN)**. If presented with an option how to connect to the internet, select **decide later**. Enter the server name: **vpn.euv-ffo.de** and choose a name you will recognise afterwards. Next, enter your username and password. You are now ready to connect to the internet.

MAC OS

Click on the **AirPort** symbol, select Open **internet connections**, then select the **VPN** tab. Choose **PPTP**, click **Next** and choose **Edit Configurations**. In the following window, enter **euv-wlan** as description, **vpn.euv-ffo.de** as the server name, then enter your username and password.

Program outline

SUNDAY 25 JULY						
15:00-17:00	registration					
17:00-18:30	opening ceremony Gunter Pleuger (President of the European University Viadrina)					
17:30-18:30	Adam Kendon – “Accounting for gesture as a component of utterance: an evolutionary approach”					
19:00	opening reception at the Marienkirche “celebrating 10 years GESTURE”					
MONDAY 26 JULY						
09:00-10:00	Jürgen Streeck – “Gesturecraft: A practice perspective”					
10:00-11:00	Susan Goldin-Meadow – “How our hands help us think”					
11:00-11:30	coffee break					
11:30-12:05	poster talks – Best Paper session I					
12:05-13:30	lunch					
13:30-14:30	poster talks – Best Paper session II					
14:30-15:00	changing rooms					
15:00-16:00	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
	panel 5 Gestures with & without speech: What do they reveal about communication, cognition and development?	gesture & modality	gestures and objects	sign language I	arts & culture	poster talks
15:30-16:00					performing arts and music	
16:00-16:30	coffee break					
16:30-18:00	gesture & aphasia	panel 11 Gesture in plurilingual interactions	panel 12 Gesture, object, development of communication and thought			poster talks
17:30-18:00						
from 19:00	reception at the city hall					
21:00	screening of “16 Traumstücke” by Anette Rose					
TUESDAY 27 JULY						
09:00-10:00	Sherman Wilcox – “Language in motion”					
10:00-11:00	Josep Call – “Iconicity, reference and motives in the gestural communication of the great apes”					
11:00-11:30	coffee break					
11:30-12:00	Best Paper election					
12:00-13:30	lunch					

13:30-15:30	Session 1 panel 6 Pointing practices	Session 2 non-human primates I panel 10 Elucidating the issues in the debate between the lab and the field on the development of non-human primate communicative and joint attentional skills	Session 3 gesture & pragmatics	Session 4 arts and film	Session 5 gesture & development I	Session 6 linguistic structures I
15:00-15:30		non human primates II				
15:30-16:00	coffee break					
16:00-18:00				metaphor		
17:00-18:00	pointing gestures					
20:00	conference dinner					
WEDNESDAY 28 JULY						
09:00-10:00	Georg Goldenberg – “Apraxia and the neural basis of gesturing”					
10:00-10:30	coffee break					
10:30-12:00	Session 1 panel 4 Gestures and other nonverbal expressions of the self-conscious emotions	Session 2 signs and gestures	Session 3 panel 7 Gesture Neuroscience I: The Neurobiology of Gesture Production	Session 4 cross-linguistic perspectives	Session 5 linguistic structures II	Session 6 gesture & cognition I
12:00-13:30	lunch					
13:30-15:30	emotion	panel 8 The conventionalization of talking about space with space		gesture & development II		
14:00-15:30			II: The neural processing of gesture during language comprehension			
15:30-16:00	coffee break					

16:00-17:30	metaphors & gestures II	panel 2 More than the sum of its parts? – The coding and interpretation of temporally connected gesture sequences	phylogenetic aspects of gesture			
17:00-17:30						
17:30-19:30	general assembly ISGS					
19:00-22:00	barbecue					
21:00	lecture performance by Rajyashree Ramesh					
THURSDAY 29 JULY						
09:00-10:00	Alan Cienki – “Language as a variably multimodal phenomenon”					
10:00-10:30	coffee break					
10:30-12:00	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
	panel 1 Function and Form in Bilingual Gesture	panel 3 Gesture, language, culture and age: The development of links between speech and gesture in children narratives	panel 13 Towards a grammar of gesture: evolution, brain, and linguistic structures	gestures in interaction	panel 9 The shared roots of Gesture and Sign: Evidence from children’s co-speech gestures	gesture production
12:00-13:30	lunch					
13:30-15:30					sign language II	gestures in clinical contexts
14:30-15:00	gesture & cognition II	gesture & child language				
15:30-16:00	coffee break					
16:30-17:00						computer science and engineering
21:00	conference party with live music by the Berlin band Leyan at “Kamea”					

FRIDAY 30 JULY						
09:30-10:30	Roland Posner – “The intentionality of body behavior”					
10:30-11:00	coffee break					
11:00-12:00	insights from computer science	reasoning & orientation	gaze	bodily behaviour	drawing & pointing	historical perspectives on facial expressions & gestures
12:00-13:30	lunch					
13:30-14:30	Best Paper 1					
14:30-15:00	Best Paper 2					
15:00-15:30	Best Paper 3					
15:30-16:00	closing remarks					

Social program

Sunday, July 25

Opening ceremony

Welcoming words of the President of the European University Viadrina, Dr. Gunter Pleuger.
3 pm at the European University Viadrina, Gräfin-Dönhoff-Building, HS1, Europaplatz 1.

Opening reception

“Celebrating 10 years GESTURE”

Opening reception, sponsored by John Benjamins Publishing Company.
7 pm at the Marienkirche, Oberkirchplatz 1.



Monday, July 26

Reception at the city hall

Welcoming words of the Mayor of Frankfurt/Oder, Dr. Wilkes.
7 pm at the city hall (Rathaus) of Frankfurt/Oder, Marktplatz.

Film and gesture

Screening of *16 Traumstücke | 16 Dream Fragments* (with English subtitles) by Anette Rose (Videoprojektion, 51 min, OmE, ZDF – Das kleine Fernsehspiel, 2001)

9 pm–10.15 pm in the Auditorium maximum in the Audimax Building, Logenstr. 2.
Introduction by Ellen Fricke and final discussion with Anette Rose.



Video still: Anette Rose

“... sie sind überall, so kleine handgroße ... Dinger” / “they are all over, these small hand-sized ... things”.

Anette Rose’s video film “16 Dream Fragments” amounts to a rehabilitation of multimodal communication within film as a medium. Seven women verbalise their nocturnal dreams and substantiate their visual images through a

linguistic-visual medium. These are co-speech gestures which, as hand-, head- and foot movements are integral parts of every protagonist’s speech. What makes this film exceptional is its setting, which Anette Rose described in a conversation with Ines Lindner as follows:

“For ‘16 Dream Fragments’, I have fixed and standardised setting and individual elements of the films, pretty much like for a scientific experiment. I stage the pieces in a neutral studio. I delete the protagonists’ private space. No door, no window shall arrange the room as a narrative moment or divert the attention away from the narratives or interpret them. Like a ‘close-up’. It is filmed with three synchronous cameras. I decide at the beginning, which camera angles are necessary to capture the bodily presence during narration. Starting point of my observation is how the protagonists cope with translating their nocturnal visions into language. I trace ‘the dream’s gradual fabrication while speaking’ (freely adapted from Kleist).”

Following the level of temporal linearization, the editing is less determined by the reproduced dream content but by the manner of narration: The speaking body’s and its limbs’ constellations in connection with the standardisation of camera angles resemble a score of serial music. Generally, the film resists any psychoanalytic interpretation: Due to the difficulty of reenvisioning, remembering and inventing merge seamlessly during the narration. This moment of elaboration and explication within the invention and the speaker’s gestus before any attribution of meaning is the point at which Anette Rose’s film pauses and lingers in a moment of concreteness and concretion. (Ellen Fricke)

Anette Rose, born in Bünde/Westfalen lives and works in Berlin. www.anetterose.de.

Tuesday, July 27

Presenting

Anette Rose’s Enzyklopädie der Handhabungen | Encyclopaedia of Manual Operations (Video installation)

5.30 pm- 6.15 pm in the Gräfin-Dönhoff-Building, Europaplatz 1 (room will be announced in the conference program).

Introduction by Ellen Fricke

The Berlin artist and film-maker Anette Rose gives an overview of her artistic work in general and talks about her video installation *Enzyklopädie der Handhabungen | Encyclopaedia of Manual Operations* which partly can be seen in every conference room directly before the afternoon sessions during the whole ISGS conference. What characterizes her work?

Anette Rose: “I’m interested in the strategies of documentary and avant-garde films that operate close to reality. It’s while observing and shrinking work’s formal framework that the unpredictable happens. How much scope does the human hand have in standardized work processes? How do the hand and the eye cooperate? How do machines replace the hand? What is the difference between manual gesture and manual action? Transcending the culturally established separation of work by hand and brain I am concerned with haptic intelligence

and the variety of links between grasping manually and grasping mentally (or gripping and grasping), with the links between hand, eye and word.”



Encyclopaedia of Manual Operations, Video stills.

Funded by “Medienboard Berlin-Brandenburg” and “Künstlerinnenprogramm der Berliner Kulturverwaltung”.

Anette Rose’s “Encyclopaedia” comprises on the one hand manually conducted actions like fettling, polishing, blanking, linking, kneading and milling that are contrasted to automated series of operations performed by machines and robots. On the other hand, people are being interviewed who are professionally engaged for example in product design, tool development and haptic intelligence. What makes these interviews special is the fact that the head’s phonetic articulation and the hand’s manual articulation have been filmed with two different cameras and are thus collocated on an equal footing. This allows the viewer to focus on the gestures accompanying speech. When manual operations, movements by machines and robots automating these operations as well as speech-accompanying gestures describing these operations next to each other, we can discover a bidirectional abstraction process:

Firstly, an abstraction of manual operations in automated production processes and robot movements. Secondly, an abstraction within the manual signs of the speech-accompanying gestures whose object are manual operations. (Ellen Fricke)

Conference dinner

8 pm at the canteen of the Gräfin-Dönhoff-Building, Europaplatz 1.

Wednesday, July 28

Barbecue

Barbecue: Make sure to give your orders in advance, there will be a list with the choices at the registration desk.
7 pm – 10 pm at the terrace of the canteen of the Gräfin-Dönhoff-Building, Europaplatz 1.



Dance and gesture

Lecture Performance by Rajyashree Ramesh

Indo-German Dance Theatre: Goethe’s Iphigenie

With Rajyashree Ramesh/Dance theatre, concept, choreography and Erika Eller/Theatre

9 pm at the Auditorium maximum at the Audimax Building, Logenstr. 2.

Introduction and moderation of the final discussion by Cornelia Müller.

Goethe’s Iphigenie

‘The sovereign poet operates through word. Oh sure! He operates through dramaturgy. He operates through dance. I beg your pardon?’

Thus, the opening sentence of a German press review of the dance drama based on Goethe’s ‘*Iphigenie auf Tauris*’ and conceived as an innovative attempt to forge seemingly distinct genres of expression – body and speech, dance and theatre. But are they so distinct? In the practised dance theatre tradition of India, spoken theatre, movement and expression have been cumulatively called ‘*Natya*’, differentiated into four forms of *Abhinaya* ‘articulation’. These have been used in this choreography in various cross-cultural and cross-disciplinary dimensions to unfold the story of Iphigenie, daughter of King Agamemnon, in lonely exile on the island of Tauris. In **Vachika**: ‘verbal articulation’ Goethe’s original text spoken in German theatre tradition is cross-referenced with Indian poetry sung in the melodic *Raga* tradition. **Aharya**, ‘costumes and jewels’ comprising of Indo-Greek dress codes, accessories and jewels are intended to both depict the characters as in a typical dance theatre as much as reflect the neutral nature of solo dance traditions where a single artist switches characters. In the main expressive element, **Angika** ‘articulation through limbs’, an unusual blend of abstract movements in *nritta* or non-narrative dance and illustrative elements of *mukhjabhinaya* ‘mime’ and *hastabhinaya* ‘hand gestures’ is used in an attempt to make the metaphoricity of Goethe’s language ‘obtainable’. Finally **Satvika** or the ability to transform oneself into the depicted characters through expression coming from the inner disposition of the performers is aimed for by a creative coming together of the artists involved.

(See also Rajashree Ramesh’s talk on Integrating the gesture – Cognitive semiotics in Indian performing arts on Monday, July 26, 6 pm)



Thursday, July 29

Conference party with live music by “Leyan”

Conference party with live music by the Berlin band “Leyan”.

9 pm at the Kamea Club, Briesener Str. 7, Frankfurt/Oder.

keynote lectures

Josep Call

Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

Iconicity, reference and motives in the gestural communication of the great apes

Great apes use a variety of gestures for a variety of purposes to communicate with their conspecifics. I will explore three aspects of the natural gestural communication of the great apes: iconicity, reference and motives. Next I will turn my attention to artificial systems of communication between apes and humans and revisit the issue of iconicity, reference and motives in ape communication. I use the term artificial communication (as opposed to natural communication) to refer to the use or comprehension of gestures borrowed from the natural repertoire of another species. In the case of the apes this includes things like index finger pointing or sign language. I will propose that artificial communication systems differentially affect the three aspects under scrutiny in this talk. Whereas artificial communication allows apes to engage in displaced reference, it does not seem to substantially alter their motives for communication. I will conclude by speculating about the impact that artificial systems, communicative or otherwise (e.g., Arabic numerals, symbolic tokens) have on the way individuals think about and solve problems.

Alan Cienki

VU University, Amsterdam, Netherlands

Language as a variably multimodal phenomenon

For many years, a number of scholars from gesture studies (e.g., Kendon, McNeill, and others) have argued that gesture and language form an integrated whole. The field of linguistics that has perhaps been the most receptive to this claim is cognitive linguistics, which is now adapting in recognition of the significance of gesture. For example, within Cognitive Grammar, pairings of vocalizations and conceptualizations are claimed to become schematized into linguistic units through repeated instantiations in “usage events,” and this characterization has been elaborated to include “any other kinds of signals, such as gestures and body language” (Langacker 2008: 457). What would it mean for this theory of language if it pursued these claims seriously?

One answer might be that it would take language as a completely multimodal phenomenon (audio and visual). However, I will argue that this approach does not provide the best account, given that speech and gesture have different communicative statuses, gesture is not always used by speakers nor always seen by addressees, gesture use differs per culture, etc. Instead, building on work in Relevance Theory (Sperber & Wilson 1995), the selective activation of meaning (Müller 2008), and attentional analysis of meaning (Oakley 2009), I will pursue the argument that language is a flexibly dynamic category, which is only variably multimodal. The model of language proposed is one structured as a center-periphery category, with a prototype-center being the spoken words and grammar that are the traditional object of study within linguistics, and various positions outside the center being held by other behaviors that are potentially highlighted in usage events (such as intonation, gestures of various sorts, object manipulation, and others).

This description fits with an understanding of language as a semiotic system that overlaps with other semiotic systems (such as co-speech manual gesture) with which it interacts. In addition, it provides a model for describing any particular language in use in real time. A speaker can flexibly change attentional focus, sometimes making use of a larger scope of expressive behaviors than others, or shifting the focus temporarily from the prototype of spoken words and grammar to gesture, object manipulation, or even a vocalized intonation contour without words. Conversely, addressees' focus can also shift variably, from paying attention to a speaker's words without visual cues (e.g., when listening to the radio) to being an attentantly observant and listening participant in face-to-face interaction (as in the case of a perceptive therapist).

This model of language thus comes with another construct, namely the scope of relevant behaviors deployed or, conversely, taken into consideration. This flexible scope will be discussed with respect to the semantics-pragmatics distinction and its treatment as a continuum in cognitive linguistics. The changeable scope is like a sliding scale that can variably take in more or fewer semiotic systems beyond the prototype of words and grammar as being relevant. The variations – between individuals and from moment to moment – in the expressive behaviors taken into account provide the basis for characterizing language as variably multimodal

References

- Langacker, R.W. (2008). *Cognitive Grammar: A basic introduction*. Oxford: Oxford University Press.
 Müller, C. (2008). *Metaphors dead and alive, sleeping and waking: A dynamic view*. Chicago: University of Chicago Press.
 Oakley, T. (2009). *From attention to meaning: Explorations in semiotics, linguistics, and poetics*. Bern: Peter Lang.
 Sperber, D. and Wilson, D. (1995). *Relevance: Communication and cognition*. Second edition. Oxford: Blackwell. And many more...

Georg Goldenberg

Technische Universität München, Germany

Apraxia and the neural basis of gesturing

Nearly 150 years ago Paul Broca reported of patient TanTan who had lost articulated language after left frontal brain damage. In this seminal case report he noted that the patient's gestures were vivid but frequently incomprehensible. Ten years later the German psychiatrist Finkelnburg postulated that aphasic patient suffer from a general "asymbolia" which affects the production of communicative gestures as much as that of speech. In early 20th century Hugo Liepmann developed the concept of "apraxia". He characterized it as a sequel of left brain damage which frequently accompanies aphasia but is an independent additional symptom. Disturbances of communicative gestures were central to this concept but, in contrast to the early observation, these disturbances were evaluated by examination of their performance on command rather than in spontaneous communication, and this restriction still prevails in research and clinical diagnosis of apraxia.

In the first part of my contribution I will present and discuss results from studies testing the performance of communicative gestures on command. I will concentrate on miming of tool use as this is the most widely used and arguably the theoretically most interesting type of communicative gestures tested in the clinical examination for apraxia. I will show examples of disturbed miming in patients with left brain damage, aphasia and apraxia, discuss the relationships of disturbances to language and to actual tool use and present data on the localization of lesions interfering with miming of tool use. They show that disturbances are, at least in right handed patients, invariably caused by left brain damage and suggest that within the left hemisphere frontal lesions are more important than parietal lesions.

In the second part of my speech I will discuss whether defective performance of gestures on command predicts insufficient gesturing in spontaneous communication. Beyond its theoretical interest the answer to this question has ecological significance because apraxic patients have also aphasia, and a rich repertoire of comprehensible gestures could help them to compensate the shortcoming of verbal expression. Results from a study of aphasic patients' gesturing during attempts to retell short Video clips support such a relationship. Both diversity and comprehensibility of their gestures correlated with their success in miming tool use on command. This finding implies that the production of spontaneous expressive gestures also depends on integrity of left hemisphere, and particularly left frontal brain regions. This suspicion is corroborated by lesion analyses.

In the final part of the speech I will discuss the limits of our results. Even when including observation of spontaneous gestures, they are restricted to referential gestures produced in a monologue without support from communication partners. Anecdotic observations of communicative interaction between aphasic patients and their partners suggest that in such interaction modulating gestures and simple emblems can be efficient for compensating not only the loss of verbal expression but also the degradation of referential gestures.

Susan Goldin-Meadow

University of Chicago, USA

How our hands help us think

When people talk, they gesture. We now know that these gestures are associated with learning. They can index moments of cognitive instability and reflect thoughts not yet found in speech. But gesture may be able to do more than just reflect learning – it may be involved in the learning process itself. I consider two non-mutually exclusive possibilities. First, gesture could play a role in the learning process by displaying, for all to see, the learner's newest, and perhaps undigested, thoughts. Parents, teachers, and peers would then have the opportunity to react to those unspoken thoughts and provide the learner with the input necessary for future steps. Second, gesture could play a role in the learning process more directly by providing another representational format, one that would allow the learner to explore, perhaps with less effort, ideas that may be difficult to think through in a verbal format. Thus gesture has the potential to contribute to cognitive change, directly by influencing the learner and indirectly by influencing the learning environment.

Adam Kendon

Naples, Italy/Philadelphia, USA

Accounting for gesture as a component of utterance: An evolutionary approach

“Gesture first” theories of language origins do not offer compelling accounts of how or why human language uses speech as its main vehicle. At the same time, “speech first” theories omit any explanation as to why the forelimbs, especially, are so often intimately involved in utterance production. However, because vocalizations are always embedded components of acts directed to practical outcomes, other instruments of environmental modification, pre-eminently the hands, will often become involved. I suggest that as the babble of prosodic protolanguage became linguistic speech, the forelimb and hand actions that must have been an abundant component of interpersonal interactions in early hominids, as they are in apes today, were gradually recruited into linguistic functions.

Roland Posner

Technische Universität Berlin, Germany

The intentionality of body behavior

Facial expression, gesture, and posture are widely regarded as meaningful body behavior, and gesture research has so far concentrated on gestures as instruments of communication. The present lecture argues that this is a rather one-sided approach which can be highly misleading. It examines the cognitive states of persons exhibiting and interpreting a given kind of body behavior, asking what they intend, believe, intend their partners to believe, and believe their partners to intend. This investigation reveals that only a small part of human body behavior can be conceived as communication in the sense of Grice or as speech acts in the sense of Searle. It offers a unified description of all conceivable behavior types above the complexity level of meaningless physical movements and below the complexity level of communication.

Jürgen Streeck

University of Texas, Austin, USA

Gesturecraft – A practice perspective

Gesture is examined as a family of skilled practices, as part of the equipment with which human beings inhabit and understand the world together. Drawing on micro-ethnographic research in diverse social and practical contexts, I delineate some of the range of communicative and cognitive tasks which gestures of the hand help us solve, as well as of the heterogeneity of the practices that we summarily call “gesture”. How gestures facilitate interaction and shared understanding can be clarified in ecological terms, by delineating how they differentially mediate between speaker, addressee, the world at hand, the narrated world, and the repertoire of bodily schemata in terms of which we can construe communicative content.

I will give particular attention to the manual qualities of hand gestures: how they work cannot be sufficiently explained without taking seriously the structure of the human hand and how humans apprehend, make, and conceive the world by the hands. The practice perspective on gesture thus combines the phenomenological view of the living body—which focuses on its position as a “mindful” agent in the world—with the sequential analysis of moments of interaction and sense-making. Embodied communication means to inhabit the world together—not simply to represent it.

Sherman Wilcox

University of New Mexico, USA

Language in motion

The title of my presentation is an intentional double entendre. One sense derives from the primary data that I will bring to bear—the moving, visible signed languages of deaf communities. The second meaning points to the fundamental claim that I will make, that grammar emerges from the production and perception of biological motion.

My talk will be structured in three parts. In the first, I will apply dynamic systems theories to the unification of three systems of biological motion—spoken language, signed language, and gesture. I will argue that all three systems are composed of articulatory gestures, which are specializations of a more general capacity to impose meaning on perceived biological motion.

In part two, I will examine the role played by motion in the grammar of signed languages. A key goal will be to demonstrate the conceptual significance of moving bodies in the emergence of embodied grammar. I will also demonstrate how viewing signed languages and gesture as articulatory gesturing allows us to explore the developmental interface between these two communicative systems.

Finally, in part three, I will turn to the topic of the evolution of language. I will present a new hypothesis that one key aspect of syntax, temporal ordering, is inherent in biological motion. Thus, I will argue that syntax is linked to the neural mechanisms that underlie the organization and production of movement.

panels

Richard F. Young (Coordinator)
University of Wisconsin, USA

Panel presentation

Acquisition of a new form of communication poses unique challenges for incipient bilinguals. New spoken and gestural modalities must be learned and built on existing semiotic systems, gesture in pedagogical interactions with teachers involves a new meaning-making dialectic, and language and gesture learning involves the exploration of a new embodied identity. Papers in this panel explore some of these challenges, focusing on the intrapersonal function and form in bilingual gesture. The panel includes five individual 30-minute papers (25-minute presentations plus 5 minutes for clarification questions). At the conclusion of the five papers, a 30-minute open discussion will follow, in which the audience and all panel participants will have the opportunity to discuss the issues raised in the five presentations.

Suyeon Kim & Richard F. Young
University of Wisconsin, USA

The development of gesture and speech in adult bilinguals

Previous studies by Gullberg (2006), Stam (2006), and others have shown that gestures in a second language (L2) reveal how concepts are created dialectically in speech and gesture, and how the gestures of bilingual speakers of typologically different languages reveal different thinking-for-speaking (TFS) patterns. Not much is known, however, about how the gestures of advanced and intermediate bilinguals differ and what they reveal about differential cognitive processing by speakers at different proficiency levels. In this study, we report how gestures accompanying motion events index different cognitive processing by advanced and intermediate bilinguals.

Thirty-two native speakers of Korean studying in the United States participated in this study, constituting two separate groups: advanced speakers of English, who arrived here in their early 20s, and intermediate speakers, who arrived as teenagers and attended high school here. The oral English proficiency of individuals was tested and the difference of mean test scores between the two groups was statistical. Participants watched the same cartoon movie and later told the story in Korean and in English to a Korean interlocutor. Participants were videotaped and gestures were coded.

There were two main findings: (a) When participants expressed manner of motion in English (their L2) with high-frequency verbs (e.g., walk, run, and climb), all bilingual speakers synchronized manner gestures with manner verbs in English, but with low-frequency manner verbs (e.g., roll and swing), only advanced bilinguals synchronized manner gestures with manner verbs; (b) Manner fog (gestural manner in the absence of verbal manner) is very common in Korean gesture, and in the L2 speech and gesture of Korean-English bilinguals, manner fog appeared more often in intermediate speakers than advanced speakers. Thus, in expressing motion events in L2, advanced speakers were more likely to have acquired L2 conceptual knowledge and employed L2 TFS patterns. In contrast, the TFS patterns of intermediate speakers indicated a transitory phase from L1 to L2.

This study suggests that gestures serve as a window to reveal cognitive processing of bilinguals at different L2 proficiency levels that speech alone cannot reveal.

Steven G. McCafferty & Ilaria Nardotto Peltier
University of Nevada, USA

Gesture and identity in the teaching and learning of Italian

Because the use of gesture is well recognized as important to communicating in Italian, this study investigated the use of mimetic Italian gestures of identity (emblems and beats) produced by both foreign language teachers of Italian and their students in beginning and advanced classes at a large U.S. university. All four of the teachers in the study were found to use distinctly Italian gestures as a highly frequent regular feature of their presentation of self when teaching the languaculture and interacting with students. At the advanced levels, students were found to mirror teachers' Italian gestures when engaged in one-to-one interaction. Moreover, in these contexts teachers were also found to mirror students' use of Italian gestures, both those first initiated by them and in one case a gesture initiated by a student. At the beginning level, students were not found to imitate or use Italian gestures at all. Also, none of the teachers had ever been video-recorded while teaching, and all were both surprised and pleased to witness the high degree of Italian nonverbal communication that each embodied when teaching.

In offering an explanation for these findings, we consider the role of gesture as a social semiotic—as part of meaning-making in a new languaculture. We argue that by using Italian forms of gesture, teachers were inviting students into a possible future as embodied communicators of the language and culture. This proved to be of special significance to the advanced students, many of whom had either spent considerable time in Italy or were planning to do so in future. Pedagogically, then, we argue that teachers' were creating a "figured world" (a dramaturgical construction) in which students were encouraged to pursue an Italian sense of communicating and to explore a different sense of identity. Indeed, all four of the teachers felt that "speaking Italian" goes "beyond words." (One teacher even commented that she was aware of trying to get advanced students to imitate her Italian gestures.) Students who completed an online survey also pointed to the importance of gesture in comprehending and producing Italian.

We recognize three stages of actuation in language and gesture learning: Students first accumulate a sense of the meaning and use of Italian gestures through observation of their use in contexts, they next produce the gestures themselves through imitation, and finally they engage in the use of conventional gestures on their own initiative. We observed these stages even in the advanced students, who had experienced different contexts of first exposure to the languaculture, (living in Italy, growing up with an Italian relative, deciding to enroll in a course). We suspect, however, on the basis of the data and an interview with one of the teachers, that some students may never feel comfortable using Italian forms of gesture.

Francisco Meizoso
Fairfield University, USA

Gesticulation or sign language? Gesture in the narratives of the hearing children of deaf parents

In the ordering of gestures devised by Kendon (1983) and cited by McNeill (1992), gesticulation and sign language are placed at opposite ends of the continuum. At one end, gesticulation is formed by idiosyncratic spontaneous gestures lacking any conventional linguistic proprieties, which are produced in combination with speech in a global and synthetic semiosis. At the other end, sign languages are fully-fledged languages formed by conventionalized signs, which are produced in the absence of speech in a segmented and analytic semiosis.

Some previous L2 studies (Brown & Gullberg, 2008; Choi & Lantolf, 2008; Negueruela, Lantolf, Jordan, & Gelabert, 2004; Stam, 2001) have addressed the relationship between speech and gestures in order to investigate whether second language speakers, even at advanced, near-native proficiency levels, could change their thinking-for-speaking frames.

In the present study, I direct my attention to the intrapersonal function of gesture by a different type of bilingual; namely, those hearing speakers who, having been born to deaf parents, grew up developing a bimodal, bilingual linguistic interface, which borrows elements from the manual and spoken modalities. Results show how, in the construction of spoken narratives, participants display a particular sign-like gesticulation which, while co-occurring with speech, maintains linguistic properties and is, at least, partly conventionalized.

Data presented come from the spoken depiction of moving events (Talmy, 2000) of bilingual participants and are compared with those of their monolingual counterparts in both spoken and sign languages.

Kimi Nakatsukasa

Michigan State University, East Lansing, USA

Teacher's gestures and students' responses to error correction in a Japanese-as-a-Foreign-Language classroom

Research on gesture has shown that gestures help listeners' comprehension (McNeill, 1992). In the field of education, studies have presented the facilitative role of gestures in students' comprehension of their teachers' speech (Farako & Kida, 2008). However, despite interest in the field of second language acquisition on the effect of teacher/native speaker's error correction in language learning (Mackey & Goo, 2007), little research to date has examined whether the use of gesture facilitates learners' noticing and comprehension of error correction.

In this study, I investigate a teacher's use of gesture in error correction. Specifically, I explore how the teacher uses gesture when correcting student's errors in a Japanese-as-a-foreign-language (JFL) classroom and I examine the relationship between the teacher's use of gesture and learners' responses to corrections.

I observed and videotaped a JFL classroom for 20 hours and identified 76 feedback episodes, which were transcribed for both verbal and non-verbal features. These were then analyzed for (a) the modality used when correcting student's errors, (b) types of gesture (iconics, metaphors, and deictics), and (c) the accuracy and source of the student's response in relation to the modality of the teacher's error correction. Then, one feedback episode was examined to show how the teacher's gesture functioned during error correction.

Results show that the majority of error corrections were accompanied by metaphoric and deictic gestures. In addition, students provided accurate responses to corrections more frequently when the teacher corrected an error using both gesture and speech than when the teacher used speech alone. Close analysis of the transcript showed that the teacher's use of gesture indexed the location of error in a student's utterance, and provided cues for student's turn-taking so that the student could produce the correct response.

The present study shows that gesture accentuated the teacher's verbal feedback and played an important role in teacher-student interaction during error correction. It also suggests that the teachers' gesture contribute to students' better comprehension of the teacher's feedback, resulting in self-correction and accurate responses.

Tetyana Smotrova & James P. Lantolf

Pennsylvania State University, University Park, USA

Gesture in vocabulary explanations in Ukrainian EFL classrooms

The purpose of this study is to understand the role of gesture in explaining L2 vocabulary meanings in college-level Ukrainian English-as-Foreign-Language classrooms. In accomplishing this goal we adopt the perspective on gesture as an inherent constitutive of language viewed in its broader sense as a "multimodal unit" (McNeill, 2005, p. 13), where words and imagery synchronically co-express meaning in a dialectical and dynamic way. We attempt to provide insight into how the speech-gesture dialectic is enacted in the L2 vocabulary meaning-making process in a Ukrainian EFL classroom.

Data were collected in a post-secondary Ukrainian institute for economics and information technology. Participants were three nonnative-speaking EFL teachers and three groups of intermediate level EFL students. Data collection involved observing and videotaping classroom interactions over the 2008 fall semester. The subset of data we discuss in this presentation includes video recordings of three classroom interactions made in October 2008 as well as an audio recorded stimulated recall by one of the teachers. The video recordings were first annotated and then several excerpts (20 minutes long in total) were transcribed using CA conventions (ten Have, 2007). For some of them, ELAN software—designed for time-linked multimodal transcription—was used. Microanalysis of the transcripts was done to reveal the role of speech-gesture dynamics in the explanations of L2 vocabulary meanings.

Results suggest that even in a teacher-centered classroom, gesture-mediated explanations of word meanings can take the form of collaboratively co-constructed negotiation of meaning rather than as one-way input provided by the teacher. In the process of such negotiation, gesture acts as an effective mediational tool allowing for: (a) explicating through imagery the nuanced differences in the meanings of L1-L2 concepts and (b) bridging the gap between and accomplishing transition from L1 to L2 understandings of concepts. Thus, in Vygotsky's terms, gesture is able to mediate the transformation of spontaneous L1 concepts into scientific L2 concepts (Vygotsky, 1987).

Results also imply that speech-gesture mediation in EFL classroom negotiation of L2 vocabulary meanings may contribute to co-constructing ZPDs for enhancing the development of L2 concepts (McCafferty, 2002). Analysis also shows that teacher/student speech-gesture units act in concert with other multimodal affordances provided by the classroom setting to ultimately develop L2 learners' ability to "remediate" themselves in the second language (Lantolf & Thorne, 2006, p. 5).

Katharina J. Rohlfing¹, Stefan Kopp¹, Jan Peter de Ruiter¹ & Adrian Bangerter²
(Coordinators)
(1) Bielefeld University, Germany; (2) University of Neuchâtel, Switzerland

Panel presentation

When one gesture immediately follows another, the two gestures together may represent more than just the sum of the two separate gestures. For example, when mothers explain to their children how to place two objects in a certain spatial relation by pointing at the two objects in immediate succession, they do not only identify the participating objects but they also indicate the spatial relations between them. If there is no retraction of the hand between the single pointing gestures, the hand will automatically draw a trajectory according to which the child should put the objects together. Similarly, when pointing to explain a relation that is considered canonical between two objects (e.g. a train inside a tunnel), mothers seem to produce pointing gestures in form of a *saccade*, i.e. they do not retract their hand between the gestures for the train and the tunnel. Such a saccade may convey additional semantic information about the relatedness (canonicity) of the two objects (Rohlfing 2005). This is an example of a situation in which the sequence of two successive gestures can establish a spatial pattern because of the contiguity, and probably contingency, of single gestures. In the case considered here, the pattern might come about as a consequence of the incrementality of verbal – gestural thinking that motivated the expression. The observed saccade may not be intentional, but could also originate from the necessary motor motions when performing fast and sequential pointing to different participants (Rohlfing & Kopp, 2007). Similarly, the motion trajectory could emerge because the speaker starts with a deictic gesture, isolating the location of an intended referent, and then focuses her thinking on closely related, yet different (iconic) information that is then expressed in a seamlessly connected iconic gesture, retaining the previously adopted hand shape. The final gestural performance will, therefore, result not only from the individual form of each single gesture, but also from how they are combined and reconciled in accord with the gesture specific timing constraints. This means that effects like co-articulation due to biological constraints of the human body and motor control (see De Ruiter 2000 for a possible mechanism for the production of gestural fusions), as well as the time characteristics of the processes involved in this form of incremental gesture thinking may have a significant impact on the resulting gesture pattern. This performance may, in turn, be perceived and interpreted by the observer as simultaneously expressing different forms of semantic information.

In this session, thus, we want to shed light on these tightly timed combinations of gestures, which we will call *gestural patterns*. More specifically, we will focus on the following questions: (1) what different forms of gestural patterns can be identified? (2) how to code a gestural pattern? As one complex or two or more consecutive gestures? (3) how to decide about the function and the type of the gestures (e.g., deictic or iconic) in a gestural pattern? (4) how to identify the various conceptual and semantic components.

Adrian Bangerter¹, Jan Peter De Ruiter², Eric Mayor¹ & Eric Chevalley¹
(1) University of Neuchâtel, Switzerland; (2) Bielefeld University, Germany

Gestural and speech patterns in collaborative multimodal referring

Referring expressions are complex multimodal acts that contain multiple components including verbal language (descriptions of target features or target location), pointing gestures and iconic gestures. They unfold in time and are sensitive to partner feedback. Previous research suggests various modalities contribute different kinds of information. Pointing gestures and descriptions of target location serve to focus addressee attention on the target region (Bangerter, 2004), whereas descriptions of target features or iconic gestures serve to unambiguously identify the target. To date, however, the complexity of the within-utterance synchronization these modalities remains understudied (Bavelas, 1994).

This presentation will report results (quantitative and qualitative) on the timing, embeddedness, and coordination of pointing gestures, iconic gestures and speech in referring expressions. The task is an experimental referential task where pairs of participants identified targets (photos of faces) from 6 arrays that were more or less densely packed with stimuli (targets and distractors). A director had access to the target identity and collaborated with a matcher to communicate this identity. Arrays were mutually visible to both partners.

Forty-eight multimodal referential acts were randomly sampled (8 from each array) and coded using Elan. We coded the launch, apex and retract phases of pointing gestures, as well as embedded iconic gestures and speech (individual words and disfluencies like uh), each on separate tiers. We focus on pointing gestures as the main vehicle for structuring the referential acts. Two noteworthy sets of findings emerged. First, pointing gestures were quite complex. Many embedded gestures and subordinated movements took place during the apex. One interesting phenomenon involved multiple finger flicks time-locked with linguistic aspects when the pointing arm is fully extended. Another involved embedded iconic gestures. There were 12 cases where iconic gestures were either embedded in the apex or accompanied pointing during the launch and retract phases. They were either seamlessly integrated with pointing or interrupted pointing gestures (e.g., interrupting a retraction to perform an iconic gesture). Second, directors recurrently exhibited incremental audience design about both verbal and gestural information during referential acts (Clark & Krych, 2004), for example by holding points while gazing towards addressees to assess understanding, seeking explicit feedback for understanding, or adapting referential production to matchers' feedback. Results will be discussed in relation to the workshop topic on gestural patterns.

Stefan Kopp & Kirsten Bergmann
Bielefeld University, Germany

When sequential gestures construct spatial discourse

When describing spatial scenes, speakers can hardly convey all information in a single speech-gesture combination. Rather, they start to organize and package the content in different ways that depend, e.g., on their spatial-verbal skills (Alibali & Hostetter 2007) or the encoding possibilities of the language they are using (Kita & Özyürek 2003). In result, different ways of portioning information into packages of different size emerge: From encoding an entire message into a single pair of intonation and gesture phrases, to distributing a complex spatial representation across a succession of such chunks (e.g., Enfield 2005). Another strategy, in-between these two extremes, can also be observed frequently: Speakers employ two or more tightly timed iconic gestures (i.e., a gestural pattern) to construct a spatial discourse that persists for a short period of time and accompanies a complex verbal construction. For instance, while saying “and then you drive towards a pond“ the speaker first raises the left hand to place the pond in gesture space and, shortly thereafter, moves the right hand along a linear trajectory directed towards the other hand (i.e., the pond). The spatial objects and events being depicted depend subtly not only on the form of each individual gesture, but also on their relative timing. Thus, from the recipient’s point of view, the interpretation of such patterns entails integrating the single gestures by drawing upon their temporal, spatial, as well as semantic contingencies. We report on the coding and analysis of such gestural patterns in an extensive corpus of direction-giving dyads (Bergmann & Kopp 2009a, 2009b). The questions addressed include: (1) which representation techniques or morphological features come to be combined in different gestural patterns? (2) what are their semantic components and what kind of spatial discourses are laid out by them? (3) what kinds of relative timing occur between single gestures and what may be its likely function?

Katharina Rohlfing, Angela Grimminger & Juana Salas Poblete
Bielefeld University, Germany

When pointing is used to express iconic meaning

In a task-oriented dialogue, mothers instructed their two years old children (22 to 24 months old) to put two objects together. In the setting, the task difficulty was operationalized by the canonicity of the required relation, in which the objects were put together (canonical such as ‘an iron on an iron board’ and noncanonical like ‘a cup under a table’). Previous research has shown that canonicity as a form of task difficulty affects maternal gestures (Rohlfing et al. 2009; Grimminger et al., 2009). The main goal of the study reported in this paper was to examine complex pointing behavior of mothers, which can be characterized as multiple pointing gestures following tightly on each other, without a visible retraction phase. Here, we specifically investigated the concept of a pointing saccade (as suggested by Rohlfing, 2005) and tested the hypothesis whether it conveys information about the togetherness of two objects. For the task-oriented dialogue, we predicted that more pointing saccades would be produced in canonical tasks, in which the objects are put together, because they ‘belong’ together in a specific way and serve a particular function. We further argue that the timing between two pointing gestures can be interpreted as conveying additional semantic information about objects, which function has so far been attributed exclusively to iconic gestures.

Olga Capirci¹ & Jean-Marc Colletta² (Coordinators)

(1) Conzilio Nazionale delle Ricerche, Rome, Italy; (2) Université Stendhal, Grenoble, France

Panel presentation

Recently Kita (2009), reviewing the literature on cross-cultural variation of gestures, clearly shows that, although the link between speech and gesture was 'universal', the way and the rate gestures are produced can vary across languages and cultures. However, there has been a very small number of studies that investigated how cultural differences in gesture, cognition and language emerge in the course of child development. For instance, studying early stage of communication, Iverson et al. (2008) found a larger use and a broader repertoire of representational gestures in Italian children compared to American children. Studying monologic discourse abilities in older children aged 6 and 10 years who narrate a story, Capirci et al. (2009) stated that Italian children gesture significantly more than French and American children. As for language, studies by Gullberg et al. (2008) and Özyürek et al. (2008) indicated an effect on the gesture representation of spatial movement. Thus, the way we express motion events is also linked to the language-specific linguistic means to code for spatial movement, thanks to the co-expressive properties of speech and gesture. Kita concludes his article with the hope that his review stimulates further studies on the relationship between gesture and culture, underlying how, particularly the work on child language acquisition, may help us to understand the development of 'thinking-for-speaking' processes. With this Panel we wanted to grant Kita's suggestion, presenting five studies that analyse the development of the link between speech and gesture in different languages and cultures. All the works consider the narrative productions of preschool and school aged children, in a very similar age range. The task is always a speechless cartoon, the same in three works. Also the methodology of data collection and analyses are quite similar, if not the same. All the studies analyse the effect of culture on gestural production and age differences; three of the studies also present direct cross-cultural and/or cross-linguistic comparisons. This panel, as a whole, hopes to offer a contribution for a better understanding on how different languages and cultures affect the development of links between speech and gesture in children.

Olga Capirci¹, Jean-Marc Colletta², Carla Cristilli³, Valerio De Santis¹ & Maria Graziano⁴

(1) Conzilio Nazionale delle Ricerche, Rome, Italy; (2) Université Stendhal, Grenoble, France; (3) Università degli Studi di Napoli "L'Orientale", Italy; (4) Scuola Europea di Studi Avanzati, Université Stendhal, Napoli and Grenoble, Italy and France

Linguistic and gestural reference tracking in Italian and French children's narratives

The capacity to construct a cohesive discourse is a late acquisition. Studies indicated that gesture can be related to different aspects of discourse structure. So et al. (2009) found that when speakers fail to identify a referent in speech, they do also in gesture, thus confirming McNeill's thesis on the parallelism between speech and gesture. Nevertheless, they hypothesised that children can use gesture to compensate their difficulties to specify reference in speech. Gullberg (2006) examined gestures accompanying the introduction and tracking of animate referents in adult learners of a L2. She observed that learners use an over-explicit maintained reference both in speech and gesture significantly more than native speakers. Both So et al. and Gullberg, analysed only the deictic function of gestures. Nevertheless, a recent study on Italian children showed the significant role played by gesture representational strategies in disambiguating linguistic anaphoric mistakes and making referents identification clearer (Cristilli et al., in press).

The present study aims at investigating, in a cross-cultural and -linguistic perspective, whether and how the difficulties children experience in tracking reference are compensated by anaphoric gestures and how the relationship between the linguistic and gestural anaphora changes with age. We focused on Italian and French children and considered both deictic and representational anaphoric gestures. As for the role played by linguistic differences in the use of anaphoric gestures, we devoted a particular attention to a sharp grammatical contrast between Italian and French, the former allowing zero anaphora, whereas the latter doesn't.

We asked 120 six and ten year old Italian and French children to narrate a speechless cartoon previously shown to them. Children's gesture and speech were transcribed and annotated using the ELAN software aimed at annotating language and gesture relations. Speech and gesture annotations were made and controlled by independent coders. As for linguistic data, our analysis included discourse cohesion (connectives and language-specific anaphoric devices) and narrative structure; for the gestures, we considered representational and deictic strategies used with anaphoric functions.

Considering the difficulties children have in tracking reference in discourse and those that the Italian children have mainly in mastering zero anaphora, we have assumed that differences would emerge between Italian and French children with the former using more anaphoric gestures than the latter to disambiguate the referents of incorrect anaphora.

As for age effects, we would expect that: in both groups of children, the proportion of abstract deictic gestures would rise with age; in both groups, younger children would use representational gestures mainly to disambiguate anaphoric mistakes, while the older would use both representational and deictic gestures mainly to make referents of correct linguistic anaphora more explicit.

On the basis of the studies carried out on gesture and culture relationship, we assume that Italian children use more anaphoric gestures than French not only because of their respective languages characteristics but also as an affect of their different cultures. Data will be analysed and discussed in order to sort out the respective impact of culture, language and age on this key feature of discourse development in children.

References

- Cristilli, C., Capirci, O., Graziano, M. (in press). Le funzioni anaforiche della gestualità nel racconto dei bambini. Proceedings of The International Conference "Spoken Communication", Naples, Italy, 23–25 February, 2009.
- Gullberg, M. (2006) Handling discourse: Gestures, reference tracking and communication strategies in early L2. *Language Learning* 56:1, 155–196.
- So, W., S. Kita, S. Goldin-Meadow (2009) Using hands to identify who does what to whom: Gesture and speech go hand-in-hand, *Cognitive Science* 33, 115–125.

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How do French and Czech children and adults gesture when speaking about motion?

The aim of this paper is to contribute to the general discussion about the impact of inter-linguistic differences on conceptualization and multimodal expression of voluntary motion. The theoretical framework of the present psycholinguistic study combines the hypothesis of linguistic relativity (Whorf, 1956), the verb-framed vs. satellite-framed language typology (Talmy, 1985) and the gesture-speech tandem conception (McNeill, 1992). We observe how language-, culture- and age-specificities influence the way French and Czech natives gesture when speaking about motion and we consider possible implications for the underlying conceptualization of motion. Participants are 5 and 10 years old children and adults. They are asked to retell short animated cartoons containing different types of salient voluntary motion events and their narrations are videotaped in order to be analysed later.

The motion is characterisable by its specific path (up, down) and manner (running, flying). French as a verb-framed language encodes path in a main verb and manner in a gerund. Czech as a satellite-framed language encodes path and manner together in one main verb. By the choice of Czech rather than other satellite-framed language, we don't only intend to add Czech data to the data package, but we would like also to show some interesting specificities of Czech. For example, Czech as well as English speakers normally verbalise both of path and manner ("přeběhnout", "run across") while French speakers make a strong preference for expression of path alone ("traverser"), expression of manner demanding more complicated structures ("en courant"). However, when important or useful, English speakers can remove manner and take recourse to path-alone expressions ("cross/go across"), but for Czech ones this alternative is almost impossible because of an important lack of no-manner-motion verbs (for differences between Germanic and Slavic languages see Slobin, 2006). We elicit these normal and alternative strategies using different ways of videopresentation of motion event: visualisation of its 1) manner & path (running across), 2) manner only (running) (Hickmann, 2006; Gullberg et al., 2008), 3) highly specific manner (spinning, tumbling) (Özyürek et al. 2008) and 4) path only (crossing) (ad hoc version).

Our purpose is to consider the relation between language and cognition taking into account speech not alone but in combination with coverbal gesture. Differences in gesture are supposed to appear on three levels:

- 1) French versus Czech: A) French gesture shows path more frequently than manner but Czech gesture is not marked by such a disproportion and B) French speakers express path and manner in two separate gestures while Czech ones encodes them together in one complex gesture.
- 2) Children versus adults: A) Child gesture is very similar to the language-specific adult gesture, however B) children prefer simpler gesture constructions than adults and C) young children, in contrast with adults, use not only arms to produce gestures.
- 3) Across stimuli types: We suppose that gesture can downplay or complete verbally conveyed content or simply be redundant in function of speech's fidelity to the cognitive representation of just viewed motion.

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Comparison of the development of the use of two pragmatic gestural expressions in Italian and French children

Kendon (2004) describes two pragmatic gestural expressions, which seem very widespread among Italian and Anglophone speakers. These are: 1) the 'palm presentation' or PP gesture, described as a gesture of "offering" or "presentation" and generally used when a speaker is giving examples, summarizing events or episodes when telling a story, or when giving the premises of an argument (cf. Müller, 2004 for Spanish speakers); 2) the "palm with a lateral movement" or PL gesture, defined as a gesture of 'withdrawal' and used to communicate the speaker's inability or unwillingness to intervene with respect to something.

In a recent study Graziano et al. (in preparation) have investigated the development of the use of these two gestures in Italian children, showing that starting from the age of 6 both gestures are used in contexts similar to adults. The authors claim that the appearance of the PP and the gradual transition to more complex uses of the PL at that age, can be correlated to the child's development of textual and pragmatic abilities, reflecting the child's growing ability to construct a narrative having both a referential and an evaluative function (Labov, 1972).

In the current study we compare the use of PP and PL in narratives produced by 22 Italian and 43 French children divided in two age groups (6 and 10 years old). The narrative task was elicited with a short animated cartoon. All the narratives were videotaped and later analyzed for the linguistic and gestural components. As for speech, both syntactical complexity and textual cohesion were taken into consideration; as for gestures, they were coded adopting Kendon's functional approach.

Preliminary results show that French children produce less PP and PL gestures as compared to the production of Italian children. More specifically, the six years old French children use neither PP nor PL gestures. The usage of these two gestures appears at the age of ten. Nevertheless, French children use them in less rich discourse contexts than the Italian counterpart. For example, while Italian children use PP when giving background information, giving an explanation or introducing a new unit of information, French children use them only at the beginning of the story. As for PL, Italian children use them when something said is considered obvious or when abandoning a current attempt to describe an episode or to pronounce a word; in contrast French children scarcely use them at all.

Cultural differences might explain our results. If so, French children should use other gestures in the PP and PL discourse contexts of Italian children. Besides, French adults should use not only PP and PL gestures in the same contexts, but other gestures as well. Complementary analysis will then be completed in order to check this hypothesis, already plausible when considering the fact that Italian children seem to be more exposed to the use of PP and PL in discourse: Italian children have been reported as using PL at the age of 4 (see the previous research).

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Do cultural norms related to gender influence gestural behaviour among South African children and adults?

This presentation will focus on the effects of culture on the deployment of spontaneous gesture between the genders. Do female and male speakers of South African Bantu languages employ gesture differently? If so, how does gesture use develop in children? Are there any gender differences in the use of gesture by Zulu speakers from a developmental perspective?

We examined four spontaneous conversations among Zulu and South Sotho males and females aged 18 to 25 years in single sex and mixed groups under natural interaction conditions (Brookes, 2001; 2005). We also collected data of 32 children between 5 and 12 years old and 12 adults under experimental conditions (Kunene & Colletta, 2008)

Our first hypothesis is that males would use more spontaneous gesture (or gesticulation, as defined in Kendon (2004), than females in a narrative task. As part of a larger cross-linguistic project (Colletta et al. in press.), this empirical study consists of an experimentation protocol in which a total of 46 subjects who are isiZulu speakers were filmed during a narrative task.

Each subject was shown a 2-minute extract of an animated cartoon. They were then requested to recount what they had seen to an interviewer. The 46 video files were transcribed and annotated using ELAN software. Our analysis includes the examination of linguistic data (words, clauses, type of clauses, subordination cues), discourse (connectives, anaphora), narration activity (episodes, commentaries) and gesture (function, relation to speech, coding of narrative voice, representation of space, marking of cohesion).

Results from analysis of natural interactions among adults show that male youth make more frequent use of gesture per speech clause and utilize a wider gestural space than females in interactions with their peers. Males also make more use of a larger repertoire of quotable gestures and know significantly more of the quotable repertoire than their female counterparts. Users modify their gestural behaviour in terms of frequency and gestural space according to interlocutor's gender and age, familiarity and formality of social situation. Gestural behaviour is a key aspect of indexing a male urban streetwise youth identity. Social norms dictate that women should not gesticulate in the same manner nor make frequent and extensive use of the quotable repertoire. Such communicative behaviour among females indexes disrespectability. Results from the experimental condition, showed no significant difference on the effect of gender on the use of co-speech gesture. However from a qualitative analysis, we note a marked difference in the deployment of gesture space (McNeill, 1992) between genders. Boys use a bigger region of space around the body whereas girls restrict themselves to a smaller and frontal region of physical space when using spontaneous gesture.

Differences in gesture development and use appear to be related to age, gender, language and cultural norms of interaction where gestures index social relationships and identities.

References

- Brookes, H. (2005): What Gestures do: Some communicative functions of quotable gestures in conversations among Black urban South Africans. *Journal of Pragmatics*, 37, pp. 2044–2085.
- Brookes, H. (2001): O clever 'He's streetwise'. When gestures become quotable: the case of the clever gesture. *Gesture*, 1, pp.167–184
- Colletta, J.-M., Kunene, R, Venouil, A., Kaufman, V. & Simon, J.-P. (2009). Multitrack annotation of child language and gestures. In M. Kipp et al. *Multimodal Corpora*. Berlin, Heidelberg New York, Springer.
- Kendon, A. (2004): *Gesture. Visible action as utterance*. Cambridge, Cambridge University Press.
- McNeill, D. (1992): *Hand and mind. What gestures reveal about thought*. Chicago, University of Chicago Press.

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When do children suppress gestures?

A previous study (Sekine & Furuyama, 2009), which investigated the development of discourse in Japanese elementary school children, found that the number of gestures produced basically increases with age during the elementary school period, however, the number of gestures decreases temporarily in the middle grades (9- and 10-year-olds). To understand why middle graders produce fewer gestures than other ages fully, it is necessary to look at their speech and gestural production closely. Adult speakers sometimes stop making a gesture in the process of production and change it to an adaptor, such as touching their hair or scratching an eye, which seems a socially preferable movement, and that satisfies personal needs and helps one adapt to the environment. I termed this behavior a disguised adaptor, which is defined as a gesture that is altered to an adaptor, before or while the stroke of gesture is executed.

Since this disguised adaptor might be related to the temporal decrease of gesture production in the Japanese middle graders, it is important to examine the appearance of disguised adaptors during the elementary school period. This study investigates whether elementary school children produce disguised adaptors, and if so, when and how they produce them.

Sixty school aged children and their parents participated in this study. Out of sixty children, there were ten children in each grade, from first to sixth grade (7- to 12-year-olds), half were boys and the other half were girls. Each child watched a seven-minute animated color cartoon from the Tweety and Sylvester series in a quiet room. After watching it, the child was instructed to retell the story to their parent. However, the listener was not allowed to ask any questions or provide any prompts such as 'Then?' or 'Next?' unless the child appeared stalled or distracted.

Disguised adaptors were found in elementary school children. Disguised adaptors produced were categorized into two types; an adaptor that occurred by itself without a gesture after it, and an adaptor where a gesture was produced immediately after the adaptor finished within a gesture unit. The result showed that children did not produce either type of disguised adaptor until the age of 8. As for the number of children who produced disguised adaptors without after-gesture, out of ten children for each age group, there was one 9-year-old, three 10-year-olds, and five 11-year-olds. The number of children who produced disguised adaptor with after-gesture was two 10-year-olds, one 11-year-olds, and two 12-year-olds.

Emergence of disguised adaptors implies that children start to notice that a listener pays attention to a speaker's gestures. Such awareness begins from 9-, 10-year-olds. Why do children produce disguised adaptors from the middle grades? There are two possible hypotheses. One is that children start having knowledge 1) that gestures can be seen as informational recourse by others, or 2) that gesturing is an undesired behavior in specific situations. Considering fact that older children produce gestures after a disguised adaptor, children start to see gestures as an informational source with age.

References

Sekine, K. & Furuyama, N. (2009). The development of gestural tracking reference in Japanese school-aged children. In *Proceedings of International Conference of Multimodal*, pp.151–152.

Pio Enrico Ricci Bitti (Coordinator)
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Panel presentation

The so called self-conscious emotions (i.e. shame, guilt, embarrassment, pride...) are not included among the small list of the so called primary or basic emotions (i.e. fear, anger, happiness, sadness, disgust...) that are considered to be innate, biologically based, pan-culturally experienced and identifiable through discrete and universal specific facial expressions (Ekman & Friesen, 1971; Ekman 1992, 2003).

Several studies have in fact outlined the difficulty to find specific and discrete facial expression for any self-conscious emotion; these studies have shown the need to consider other non verbal signals (i.e. bodily posture, head position and/or movement, gaze direction.) in the analysis of prototypical non verbal expression of embarrassment, pride, and shame (Keltner 1995, 1997; Tracy & Robins, 2004, 2007). Moreover studies on congenitally blind individuals have shown that non-verbal expressions of pride and shame are likely to be innate and intentionally inhibited in accordance with cultural norms (Tracy & Matsumoto, 2008).

This panel intends to contribute to the current debate by bringing together experimental data and theoretical considerations; particularly the panel includes three presentations. The first one analyzes the development of self-conscious emotions and their expressions. The second presentation reports a study assessing the expressive behaviours of individuals during political and judicial debate conveying meanings of pride, haughtiness, defiance and provocations. Finally the third presentation concerns the non-verbal expressions of embarrassment.

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Nonverbal expression of embarrassment

Laboratory studies and naturalistic observations have shown that the expression of embarrassment is associated with gaze aversion, shifting eye position, speech disturbances, face and body touching, a “nervous, silly smile”, a rigid posture... (Keltner, 1995; Keltner & Buswell, 1997). This means that embarrassment, as the other self-conscious emotions, is not expressed by a single specific facial expression but by a wide constellation of non-verbal signals, where facial expression is not the most important one.

Nonverbal behaviours in response to viewing slides depicting nude males, nude females, erotic couples and neutral pictures were studied in 22 female and 16 male university students. Participants were unaware of being video recorded. A questionnaire was administered. After each session the participants were asked to rate how they felt embarrassed while viewing slides belonging to each slide category when viewing the slides and during the inter-slide interval.

Following Keltner and Buswell (1997), we coded eleven non verbal behaviours: lip movements, silly smile, gaze shift, gaze down, head down, head away, head inclination, face and body touching, hand movements, shifting posture and chair rotation.

The most frequent nonverbal expressions were: lip movements, chair rotation, gaze shift, head inclination, face and body touching, gaze down and hand movements.

The data are discussed in relation to the self-reported rating of embarrassment and other experimental variables (gender of participants; the four categories of slides...).

References

- Keltner, D. (1995). Signs of appeasement: Evidence for the distinct displays of embarrassment, amusement, and shame. *Journal of Personality and Social Psychology*, 68, 441–454.
- Keltner, D., Buswell, B. N. (1997). Embarrassment: Its distinct form and appeasement function. *Psychological Bulletin*, 122, 250–270.

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Expressions of pride, haughtiness, provocation

Pride is an emotion linked to the goal of self-image, more specifically the goal of personal autonomy. We see pride as: 1. "being proud of": an emotion about doing or being something, that causes one to have a positive self-image; 2. "being a proud person": a personality trait leading to attribute a high value to the goal of being autonomous (not dependent on others), and inducing, e.g., to avoid asking, apologising, thanking, acknowledging the others' credits toward oneself.

Pride is the opposite of shame. While expressing shame is an apology – a communicative signal acknowledging one's flaws – communicating you are proud of something means attributing it a positive value, and may function as provocation, i.e., reversing a negative evaluation into positive. See the case of gay pride: if you are subject to stigma, discrimination, ridicule, to eradicate the negative evaluation that others attribute to you, and that you may have introjected, indifference to others' judgement is not enough: with the help of others like you, you become proud of what they despise. Pride as provocation has the function of challenging traditional values, to bring about new aesthetical or moral standards, and to open the route to autonomy.

Haughtiness is close to pride, but more a stable trait than an emotion. In haughtiness, power comparison between self and other is more salient than in pride. The haughty one feels superior to others (more handsome, more noble, more clever...), he aims at looking one who has more power (value) than others (and he is seen as presumptuous when others do not acknowledge his pretence of superiority), while the proud one is not as concerned in stressing his superiority; he only aims at having enough power for himself – his self image of autonomy.

Connected to provocation is the notion of challenge and the communicative act of defiance. Defying someone means to commit oneself to demonstrate that one is superior (or not inferior) to that person. And one who is proud, haughty or presumptuous has such a high opinion of oneself that he is sure he can win the challenge.

Since communicating that one feels superior to others is often a way to impress, to scare, to influence, people in situations of power comparison – for instance in quarrels or debates – express their feelings of pride and haughtiness, they provoke, challenge and defy.

Within the corpora of Roma Tre and Canal 9 political and judicial debates, the expressive behaviours of head, face, gaze and posture were analysed. The bodily expressions conveying meanings of pride, haughtiness, defiance and provocation were singled out; their physical features were described (for head movements, their direction, duration, amplitude, velocity, repetition; for gaze, iris direction, eyelids opening, eyebrow movements, sclera brightness; for facial expression, FACS Action Units), and the verbal context was analysed as to its persuasive structure. Results show that the expressions of pride, haughtiness, provocation and defiance are used to convey an image of power and to influence the Interlocutor and the Audience.

References

- Castelfranchi C. & Poggi I. (1990): Blushing as a Discourse: Was Darwin Wrong? In R. Crozier (Ed.) *Shyness and Embarrassment. Perspectives from social Psychology*. New York: Cambridge University Press, pp. 230–251.
- Lewis, M. (2000). Self-conscious emotions: Embarrassment, pride, shame, and guilt. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 623–636). New York: Guilford Press.
- Tracy JL, Robins RW. (2007): The prototypical pride expression: development of a nonverbal behaviour coding system. *Emotion*. 7(4): 789–801.

Michael Lewis

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From face to body: The development of self-conscious emotions

Research on the development of the self-conscious emotions, in particular, shame and pride, reveal an important developmental transformation with the onset of consciousness. The emergence of consciousness in the second half of the second year of life gives rise to shame and pride along with embarrassment and guilt. While the early emerging emotions such as sadness, fear and joy appear as action patterns that center on the face, the self-conscious emotions' action patterns appear on the face but more important they appear in body gesture. The development of emotional life then can be characterized as action patterns that move from social exchange to action in the world, a movement from face to body!

Katharina Hogrefe, Georg Goldenberg & Nicole Weidinger (Coordinators)
Klinikum Bogenhausen, München, Germany

Panel presentation

In this thematic panel, we discuss expressions in the visual modality when they are the sole means of communication and what they reveal about communication and cognition in adults and children. In particular, we want to compare properties of gestures without speech to gestures with speech or to conventionalized communication systems such as sign languages or homesign systems in different populations and with different methodological approaches.

The first two contributions focus on formal and structural aspects of gesture production with and without speech in two different populations of hearing speakers. (1) The first paper takes a developmental perspective: How do preschool and grade school children segment and combine single gestures for gestural messages when they are prevented from verbal expression? The formal diversity of single gestures as well as the combination of single gestures to strings will be determined and taken as indicators of gestural complexity. How does the gestural competence to substitute speech develop with age? In particular, we address the question how children's gesture production is related to verbal and nonverbal skills. (2) The second paper will use the same methodology for comparing characteristics of gestures with speech to gestures without speech in healthy adults and speakers with aphasia following left hemispheric brain lesions. For aphasic speakers, the production of speech-replacing gestures could be an adequate means to compensate for their limited verbal abilities. However, clinical observation indicates that especially patients suffering from severe aphasia are often not able to make use of gestures efficiently in everyday life communication. We try to identify how gesture production is linked to linguistic capacities and to apraxia in aphasic speakers.

The next two contributions compare gestures with and without speech to other communication systems, that use exclusively the gestural modality in a more conventionalized way, i.e. to sign language (German Sign Language; DGS) and to homesign (in Turkey). (3) Thus, in this third section differences in action and motion representation in German co-speech gestures, gestures without speech, and German Sign Language will be compared. In this, the link between language and action by comparing the nature of "simulated action" in the manual expressions used in each condition will be explored. In addition, this study will provide further insight into the communicative function of the visual modality, comparing its use within a fully conventionalized system (as in sign language) versus an unconventionalized system (as in pantomime). (4) The fourth paper will investigate how gestures are used in homesign systems of deaf children (in Istanbul, Turkey) who are not exposed to any sign language. The study will compare these homesigns to co-speech gestures of Turkish hearing children in a similar age range to see to what extent the use of gesture as the sole means of communication becomes conventionalized during development.

Katharina Hogrefe, Wolfram Ziegler, Nicole Weidinger, Susanne Wiesmayer & Georg Goldenberg

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Formal aspects of gestures with and without speech in healthy and aphasic speakers

Patients suffering from aphasia consecutive to left hemispheric brain damage could benefit from the use of gestures. Especially the production of speech-replacing gestures offers a possibility to compensate for verbal deficiencies in everyday life conversation. However, clinical observations indicate that many aphasic speakers are not able to use gestures in an efficient and adequate way. Research conducted in this field led to contradictory results. Whereas some authors point out that aphasia has an impact on gesture production (e.g. Glosser 1986), others suggest that aphasic speakers are able to use gestures in an adequate way for communication (e.g. Goodwin 2000).

The purpose of our study is to gain more knowledge about mechanisms that might determine the production of speech-replacing gestures in aphasic speakers. We will analyze gestures of aphasic and healthy speakers that are produced along with speech as well as gestures that are produced in a nonverbal narration task. For gesture analysis, we developed a method which focuses on formal and structural aspects of gesture allowing an analysis independent of the concomitant verbal utterance. We will compare gesture production of healthy and aphasic speakers in both conditions. Furthermore, we will determine how gesture production is linked to linguistic capacities and to apraxia in aphasic speakers. Our findings might provide a basis for further studies on function and meaning of gestures in aphasia.

Procedure: Twelve aphasic patients with mild to severe impairment of the verbal expression and twelve healthy speakers will be included in the study. In the first condition, participants are asked to retell short video-clips in a vivid and descriptive manner. In the second condition, they are asked to convey the contents of the stories without speech, exclusively by using their hands.

Gesture analysis: Sixty gestures from each participant will be transcribed with a modified version of the Hamburg Notation System for Sign Languages (HamNoSys; Prillwitz 1989). Coding will be conducted according to the six parameters hand shape, orientation of the fingers, orientation of the palm, location of the hand with respect to the body, and repetition. This transcription allows the determination of a formal degree of diversity indicating the potential information content of the gestures. We calculate the Hamming distance (Jones & Jones 2000), which measures in how many features two gestures differ from each other. For each participant a grand average of the pair wise distances between all 60 gestures will be calculated.

Furthermore, as an additional measure of gestural complexity we will evaluate if gestures appear as single gestures or if they combine to gesture sequences.

References

- Glosser, G., Wiener, M., & Kaplan, E. (1986). Communicative gestures in aphasia. *Brain and Language*, 27, 345 – 359.
- Goodwin, C. (2000). Gesture, aphasia, and interaction. In: McNeill, D. (ed). *Language and Gesture*. Cambridge, UK: Cambridge University Press.
- Jones, G.A., & Jones, J.M. (2000). *Information and Coding Theory*. London: Springer.
- Prillwitz, S., Leven, R., Ziener, H., Hanke, T., & Henning, J. (1989). *Hamburger Notationssystem für Gebärdensprachen. Eine Einführung*. Hamburg: Signum Verlag.

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From gesture to homesign: Emergence of segmentation and sequencing in Turkish homesigning children

Segmentation and combination is a fundamental and ubiquitous feature of modern human languages. But how does this feature come about in spontaneously and newly emerging communication systems, i.e., gesture/sign systems of deaf people who have not been exposed to linguistic input? Previous work has shown that semantic elements such as manner and path can be segmented and sequenced in the early stages of Nicaraguan Sign Language (NSL) but, interestingly, not in the gestures produced by Spanish speakers in the same community; gesturers conflate manner and path into a single unit (Senghas, Kita, Özyürek, 2004). To explore the missing step between gesturers and signers, we examined the gestures of homesigners: deaf children not exposed to a sign language who develop their own gesture systems to communicate with hearing family members.

Seven Turkish child homesigners (3;2 to 5;6 (years; months)) were asked to describe animated motion events that included simultaneous manner and path (i.e., a triangle figure jumps up a hill). In addition we asked 14 age-matching hearing children as well as 18 hearing adult speakers in the same community to describe the same events first using speech and then no speech (i.e., pantomime).

Comparing Turkish homesigning children to the Nicaraguan hearing and deaf community the following picture emerged (Senghas, Özyürek, Goldin-Meadow, in press): Homesigners resembled Spanish-speaking gesturers in that they often produced conflated only gestures (conflated-only: manner+path). However, the homesigners also produced conflated gestures along with a segmented manner or path gesture (mixed: e.g., manner only followed by a conflated gesture) indicating to an intermediate stage that may bridge the transition from conflated forms that have no segmentation to fully segmented and sequenced forms (sequenced-only: manner and then path) as in the later stages of Nicaraguan signers. Homesigners exhibited very few expressions that were purely segmented.

Could do the Turkish homesigners, half segmented and sequenced patterns be influenced or typical of the gesture patterns around them? Analysis of the data from hearing Turkish hearing groups' gestures did not show resemblance to those of the homesigners. Hearing children and adults' co-speech gestures were similar to each other and different from those of the homesigners. They used manner and path gestures very infrequently together in the same event description or in the same string of gestures. Furthermore when they did, they used the mixed strategy of homesigners significantly less. Pantomimers were different in the sense that they expressed both manner and path in their gestures more frequently than the hearing speakers. However when they combined these elements, they used mostly conflated-only strategy and almost no mixed strategy.

The findings on the homesigners together with results for the emergent language patterns of NSL and the hearing speakers' gestures (with or without speech) in the same community suggest that homesigner children are creating gestural systems that are on their way to be language-like in terms of segmentation and sequencing-one of the unique features of human language faculty.

References

- Senghas, A. Kita, S. Özyürek, A. (2004). Children creating core properties of language: Evidence from an emerging Sign Language in Nicaragua. *Science*, 305(5691), 1779–1782.
- Senghas, A. Özyürek, A., Goldin-Meadow, S. (in press). The evolution of segmentation and sequencing: Evidence from homesign and Nicaraguan Sign Language. In Proceedings of the 8th Conference on Language Evolution, Utrecht, NL.

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Can an embodied cognition account explain action representations in the visual modality? – A comparison of co-speech gesture, pantomime and sign (DGS)

An embodied approach to cognition holds that language is grounded in our sensorimotor experience of the world. We process language by evoking and simulating perceptual-motor processes involved in our real-world experiences. The link between language and action can be uniquely explored in the meaningful use of hand movements as they occur in co-speech gesture and signed language. Two recent claims make such an investigation particularly opportune: (i) The 'Gestures as Simulated Action' (GSA) framework proposes that (representational) co-speech gestures are manifestations of the perceptual-motor simulations that underlie language (Hostetter & Alibali 2009); and (ii) Signers and co-speech gesturers use space in similar ways to depict action and motion, as afforded by the iconic potential of space and imagistic conceptual representation (Liddell 2003). We investigate these claims by comparing the representation of action/motion events in co-speech gesture, pantomime (i.e. gestures without speech), and sign language. We test specifically whether representations in the three conditions are simulations of perceived events (as predicted by (i)) and whether the groups look similar to each other in this regard (as predicted by (ii)).

We collected narratives of cartoon stimulus films ("Canary Row" and "Die Sendung mit der Maus") from 15 German speakers in the co-speech gesture condition, another 15 German speakers in the pantomime condition, and 14 signers of German Sign Language (DGS). We selected seven motion events in which manner of handling and path components are simultaneous (e.g. carry the suitcase down the stairs). If both components were encoded, we further coded whether the components were segmented (more simulated) (e.g. grasping hands represent 'carry' followed by an inverted V-hand shape depicting path) or conflated (less simulated) (e.g. grasping hands representing 'carry' move along a path). If only one component was encoded, we coded whether it was manner-only or path-only.

We found that co-speech gesture and sign representations differed significantly in the representation of manner of handling and path components, with signers segmenting and co-speech gesturers conflating the components. In addition, signers made more use of their bodies (e.g. head and shoulder movement) to represent action/motion, concurrently with manual manner and even path encodings, again resulting in more simulated action representations than co-speech gesturers. Overall, the conflated co-speech gesture representations are less iconic (or simulated) of the observed events than the sign representations. Interestingly, the pantomime representations fall between the other two groups, but exhibit more segmentation and use of the body for action/motion representation than the co-speech gesturers.

Our findings show that signers and co-speech gesturers represent action/motion in different ways and that a simulated action framework can account more readily for action representations in sign than in co-speech gesture, arguing against previous claims (i) and (ii) above. We will discuss how communicative and linguistic pressures of the accompanying speech (auditory-vocal modality) drive co-speech gesture representations away from a simulated action representation compared to pantomimes and signs. Accordingly, an embodied cognition account of language production needs to be fine-tuned even to explain communication patterns that involve the visual modality.

References

- Hostetter, A.B. & Alibali, M.W. (2008). Visible embodiment: Gestures as simulated action. *Psychonomic Bulletin & Review* 15(3), 495–514.
- Liddell, S.K. (2003). *Grammar, Gesture, and Meaning in American Sign Language*. Cambridge: Cambridge University Press.

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Gestures with and without speech: A developmental approach

This study focuses on the way, in which preschool and grade school children segment and combine single gestures for gestural messages when they are prevented from verbal expression. Research into speech-replacing gestures in different age groups of typically developing children has investigated pantomime of tool use (e.g. Njikiktjien et al. 2000, Overton & Jackson 1973). In this task, children are asked to mime verbally designated actions, e.g. “Show me how you clean your teeth”. A developmental transition was found from age five to nine: While five-year-olds show “body parts as objects”, nine-year-olds pretend holding the tool. Pantomime of tool use is, however, only a very simple variant of gestures substituting speech: It only refers to a single action with a single object. Furthermore, it is usually produced on command and therefore not communicatively embedded.

By contrast, the development of gestural use to convey complex ideas or multi-step chains of actions has attracted little interest to date. To explore such competences in children, we asked 8 five and 8 nine-year old German children to retell short video clips under two conditions: Without speech, using only their hands (nonverbal condition) and with speech, expecting children to produce gesture spontaneously (verbal condition). To assess language development (vocabulary, grammar), memory span, handedness, and nonverbal intelligence, we used standardized German tests. In addition, we collected data of praxis tasks (pantomime of tool use, imitation of meaningless gestures).

For gesture analysis, we use a system that is suitable for determining the formal diversity of hand gestures by capturing physiological properties of the manual movements. In each condition, fifty hand gestures are transcribed with a modified version of a notation system, which was originally developed for sign languages (HamNoSys; Prillwitz, 1989). With HamNoSys, spatial and kinetic features can be analysed for the following categories: (1) Hand shape, (2) orientation of the palm, (3) orientation of the fingers, (4) location with respect to the body, (5) movement type, and (6) repetition of movement. Furthermore, we code the handedness of the gestures. For statistical analysis, we make use of the Hamming distance, a measure from the information- and coding theory (Jones & Jones, 2000), that indicates in how many features two gestures differ from each other. This measure allows us to define a degree of the gestural diversity with and without speech. Furthermore, we determine whether gestures constitute gesture strings or form single gestures in both conditions. Such gestural sequences, in which the hand links a series of gestural movements without returning to rest, are analyzed as a structural index to the complexity of children’s gesturing. We expect an increase of both measures – Hamming Distance and proportion of gestures combined to strings – with age. In particular, we will address the question how the development of gestural competence is related to verbal and nonverbal skills.

References

- Jones, G.A. & Jones, J.M. (2000). *Information- and Coding Theory*. London: Springer
- Njikiktjien, C., Verschoor, C.A., Vranken, M., Vroklage, L.M. (2000). Development of ideomotor praxis representation. *Developmental Medicine & Child Neurology*, 42: 253–257
- Overton, W.F. & Jackson, J.P. (1973). The representation of imagined objects in action sequences: A developmental study. *Child Development*, 44: 309–14
- Prillwitz, S., Leven, R., Zienert, H., Hanke, T. & Henning, J. (1989). *Hamburger Notationssystem für Gebärdensprachen*. Hamburg: Signum Verlag

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Panel presentation

This panel brings together diverse work on pointing practices in sign language and co-speech gesture, as well as in the tactile language of Deaf-Blind individuals. It includes work on pointing in six different linguistic communities of varying sizes. It explores how pointing partners with language in the case of co-speech pointing, and how it becomes like language in the case of sign. By assembling a mosaic of current research on pointing, the panel aims to explore the scope of variation in this “building block of human communication” (Kita, 2003, pg. 1). It further aims to bridge theoretical concerns in sign language studies with theoretical concerns in co-speech gesture studies. One theme central to this panel is conventionalization. The presentations on sign languages consider the contested “linguistic” status of pointing gestures in light of on-going processes of grammaticalization. The sign language communities represented have different histories, and the panel thus opens up a kind of cross-sectional window onto conventionalization processes. Processes of conventionalization are also central to the presentations on co-speech gesture. For example, particular pointing morphologies may be conventionally used for certain types of referents, and pointing often exploits conventional metonymic links. Part of what is at issue in the presentations is not just whether a pointing sign/ gesture is in some respect conventional, but at what particular level(s) of analysis — e.g. morphological — it is conventional. Another central theme concerns how relatively fine-grained differences in pointing morphology relate to differences in meaning. In the case of sign, these morphological differences relate to grammatical distinctions; in the case of co-speech gesture, particular pointing morphologies may relate to nuances in how the “object being referred to is presented in the speaker’s discourse” (Kendon, pg. 201). What morphological patterns in pointing are common to both gesture and sign? Further, pointing morphology is only one aspect of larger “composites” (Enfield, 2009), which, in the case of co-speech gesture, may include speech and, in the case of sign, may include other types of bodily action such as facial expression. Other salient threads in the panel include: absolute spatial frames of reference and how these are reflected in pointing; pointing to persons, including self, addressee, and others; pointing to “abstract” referents, such as temporal entities, imagined persons, and emotions; how pointing gestures display iconic properties to varying degrees; and how pointing practices are interwoven with local linguistic resources and local conceptual systems.

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Pointing to the self: Metonymy and iconicity in body-directed gestures

Speakers commonly direct gestures toward their own bodies. This presentation examines morphological and semiotic aspects of such gestures. Data are drawn from a corpus of 40 one-on-one interviews (totaling approximately eight and a half hours) from the Tavis Smiley Show, an American television program. More than 350 body-directed gestures were identified in the corpus and analyzed for: morphological features such as handedness, hand-shape, and movement pattern; place of articulation; and relation to co-produced speech, both temporally and semantically. Some quantitative trends in the corpus are noted before moving to discussion of the semiotic complexities of three different types of body-directed gestures.

The first type, self-pointing, involves pointing to a part of the body to reference the self. Self-points were most often produced with the first person singular pronoun (I) and its grammatical affiliates (me, my, mine, myself). However, the corpus also contains numerous examples of self-points co-produced with the first person plural pronoun (we) and its affiliates (us, our). In such cases, what is pointed to (i.e. the speaker’s chest) and what is referred to in speech (i.e. a group of persons) are not identical, but stand in a metonymic relation. Metonymy of this sort may be a commonplace feature of co-speech pointing gestures, but has gone largely unexamined (for relevant earlier discussions, see Haviland, 2000, pg. 32; Clark, 2003, pg. 264). In rare cases, that seem to involve striking viewpoint shifts, self-points were also co-produced with references to you, her, and his. The second type of body-directed gesture, body-pointing, involves pointing to a particular body part to reference that body part, such as a point to the side of the head while saying ear. Body-points were commonly employed in reference to the speaker’s own body, but also to some other person’s body, or to a generic human body. The third type, body-anchoring, involves anchoring experiential — that is, mental, perceptual, or emotional — notions to particular regions of the body. Body-anchors are a heterogeneous class: examples from the corpus include gestures associated with instinct, dreams, relief, and memory among others. An interesting feature of body-anchors is that they often incorporate iconic elements such as distinctive movement patterns and handshapes.

One theoretical goal of the present research is to show how body-directed gestures can enrich our understanding of gestural indexicality in general. The focus, therefore, is on those semiotic features that set body-directed gestures apart from more prototypical pointing gestures. Chief among these is metonymy. Another goal is to compare these co-speech gesture data with data on body-directed signs in emerging sign languages (e.g. Kendon, 1980). Taken together, data from both sources demonstrate the power of the body as a semiotic resource in communication.

References

- Clark, H. H. (2003). Pointing and placing. In S. Kita, *Pointing: Where language, culture, and cognition meet* (pp. 243–268). Mahwah, NJ: Lawrence Erlbaum.
- Haviland, J. B. (2000). Pointing, gesture spaces, and mental maps. In D. McNeill, *Language and gesture* (pp. 13–46). Cambridge: Cambridge University Press.
- Kendon, A. (1980). A description of a deaf-mute sign language from the Enga Province of Papua New Guinea with some comparative discussion. Part I: The formational properties of Enga signs. *Semiotica*, 31(1/2), 1–34.

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Pointing as ostensive referential practice in the Seattle Deaf-Blind Community

This paper examines interactions between Deaf-Blind people and their interpreters in Seattle, Washington where a sighted person communicates information about the environment to a Deaf-Blind person in Tactile American Sign Language. In particular, this work focuses on interactions where pointing is used to collaboratively individuate objects of reference in the immediate environment. Many members of the Seattle Deaf-Blind community have a genetic condition that causes Deafness from birth and a slow loss of vision. As vision deteriorates, these Deaf individuals move from visual to tactile reception of semiotic, social, and physical aspects of their world. Because the transition is slow, there are long periods of partial vision, punctuated by functional turning points, when driving is no longer possible, then when the use of a cane becomes necessary, and finally, when the reception of language and interactional cues must be shifted entirely to a tactile modality. As new sensory modalities are being adapted to, there are moments when thinking-as-usual (Schutz 1970) breaks down, and objects, scenes, and encounters do not present themselves recognizably. One way Deaf-Blind people address this problem is by working with sign language interpreters to triangulate between (1) visual memory (2) direct sensory input, and (3) tactile information provided by their interpreter. Through these triangulations, calculated moment to moment, a “situation” (Goffman 1972) is collaboratively constructed. This paper explores how pointing practices are employed as part of these events, yielding a locality in which, and about which Deaf-Blind people can communicate (Hanks 2005:191). Recent work on pointing in the sign language linguistics literature argues for a distinction between pointing as person reference, and pointing as ostensive reference (Antinoro Pizzuto and Capobianco 2008:85). According to these authors, the former adheres to pragmatic, semantic, and formal constraints, whereas the latter does not (ibid:84). The difference between the two rests on a broader distinction between concreteness, which is associated with spatial contiguity and gesture, and abstractness which is associated with participant roles, and language (ibid:85). Drawing on analyses of roughly fourteen hours of videotaped interaction between Deaf-Blind people and their interpreters, this paper questions the validity of such a distinction as the basis for separating “linguistic” and “gestural” aspects of communication.

References

- Goffman, Erving (1964) The Neglected Situation. *American Anthropologist* 66(6):133–136.
 Hanks, William F. (2005) Explorations in the Deictic Field. *Current Anthropology* 46(2):191–220.
 Pizzuto, Elena Antinoro, and Micaela Capobianco (2008) Is pointing just pointing? *Gesture* 8(1):82–103.
 Schutz, Alfred (1970) *On Phenomenology and Social Relations*. Chicago / London: The University of Chicago Press.

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Pointing at the time of day in Nheengatú: Gesture and the verb phrase

This paper describes a highly conventionalized set of complex pointing gestures used by speakers of the Brazilian indigenous language Nheengatú (Tupi-Guarani) to add temporal and aspectual information to the accompanying spoken language. In terms of the continuum of gestures ranging from non-conventionalized ‘gesticulations’ to highly conventionalized ‘emblematic’ gestures (McNeill 2000), they make up some of the most ‘language-like’ gestures employed by Nheengatú speakers, who rely on a model of the sun’s arc through the sky to convey the time of day and the duration of actions and events. This gestural practice generally accompanies speech in a ‘composite utterance’ (Enfield 2009) and specifically tends to combine with the verb phrase to add adverbial meaning; although it is sometimes accompanied by spoken adverbial material like the punctual ‘kurasí iké’ (pointing: ‘sun here’) or the durative ‘karuka ramé’ (sweeping: ‘in the afternoon’), spoken correlates are not obligatory. Frequently when transcribing video data consultants would derive temporal information from the recording for which I could find no spoken referent – they said they knew the event was at noon because they saw how “he pointed straight up when he said it.”

Drawing on examples from a corpus of transcribed video recordings, examples show speakers of different ages and genders using the gestural system consistently. All speakers orient towards an ‘absolute frame of reference’ (Levinson 2003) that overlays the sun’s path along the east-west cardinal axis, even when it means adjusting posture or pointing backwards through the body. Relying on conventionalized gestures that exploit this iconic resource, speakers are able to convey complex information multimodally: they can punctually mark any time during daylight hours by pointing along the arc and can convey duration between any two daytime moments by tracing a path between two points. Because these usages combine with spoken predicates sequentially, they can be thought of as partially syntactic, while the option of expressing punctual versus durative meanings might be thought of as a kind of paradigmatic opposition or inflection, forming part of semantic ‘constellations’ (Smith 1997) with the spoken material with which they occur. The resulting meanings go beyond simple ‘emblematic’ gestures by combining several different gestural principals observable in other discourse – including pointing for location and sweeping the arm for duration – to form an integrated gestural subsystem of interacting parts that has in effect become part of the grammar of adverbial modification in the language.

The analysis will consider these gestural practices in the context of Nheengatú’s typological profile as a tenseless language that derives much temporal information from adverbs and aspectual marking, showing how gesture interacts with the grammar of the spoken language in specific ways. Cases like that of Nheengatú illustrate why it is important to consider speech and gesture part of a “single plan of action” (Kendon 1997:111) where deictic reference, spatial iconicity and the multimodal combination of spoken and gestural language interact create meaning in discourse.

References

- Enfield, N.J. 2009. *The Anatomy of Meaning: Speech, Gesture and Composite Utterances*. Cambridge: CUP
 Kendon, A. 1997. “Gesture”. *Annual Review of Anthropology* 26:109–28.
 Levinson, S. C. 2003. *Space in Language and Cognition*. Cambridge: CUP.
 McNeill, D. 2000. “Introduction”. p1–11 in McNeill ed. *Language and gesture*. Cambridge: CUP.
 Smith, C. 1997. *The Parameter of Aspect*. Dordrecht: Kluwer.

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Clines of motivation: Pointing as grammar in Zinacantec family homesign

In a newly created sign language developing spontaneously in a minute speech community (of seven plus or minus two members) in highland Chiapas, apparent pointing movements play a central role in what must be described as grammar. Pointing movements, with multiple articulators, varied morphology, and inflected with evidential and other stance modulations play various roles in the language, from classic deictic shifters of a Jakobsonian variety, and verbal pro-forms, to spatial descriptors, and even to commands. I will present evidence, in this still evolving sign language, for both the grammaticalization of co-speech pointing gesture into full-blown syntax in this Mayan community, and for a reconsideration of Hockett's linguistic design features on the basis of multiplex indexicality in ZFHS.

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Pointing at objects, people and locations in Portuguese face-to-face interactions: Gesture features vs. elements pointed at, co-speech, and (inter)personal expectations

This paper is about the results obtained from the qualitative analysis of hand shape and other movement features in pointing gestures and other kinds of bodily pointing of illiterate Portuguese speakers when referring to objects, persons and locations, or when giving directions. The videos analysed were recorded in different rural regions of Portugal, where the rate of illiteracy is still considerable among people above 65 years of age. The recordings were made in natural settings, that is, outdoors, near the fields, or in front of the interviewees' houses. The interviewees were asked to talk about their work and the way they lived, so that they could easily point at locations and objects which have long been part of their lives.

In his writings about pointing, Kendon (2004: 199-224) argues that "differences in hand shape used in pointing are related to differences in the way the object being referred by the pointing gesture is being used by the speaker in the speaker's discourse" (Kendon, 2004: 199). Calbris also maintains that different uses of the fingers imply different meanings of pointing actions (Calbris, 1990: 128). Based on these presuppositions, several kinds of relations between hand shape and other interactional aspects will be considered. Pointing gestures – those specialised as pointing gestures (Kendon, 2004: 205) – will be thus analysed in relation to speech, focusing on different kinds of relationships between hand shape and:

1. accompanying word(s), more precisely: deictic elements, nouns, or others;
2. movements' amplitude and muscular tension of arms, hands and fingers, and prosody;
3. the elements pointed at (objects, locations, or persons) and whether these elements are visible or not;
4. the speaker's expectations regarding his presuppositions about the hearer's knowledge of the target of his pointing activity; in other words, what the speaker considers to be shared knowledge;
5. the speaker's subjectivity towards the objects, locations and persons he points at. Is there any subjectivity embodied in the way the speaker points at things?

The objective of the analysis is to establish whether there are any regularities in the analysed gestures and how gesture features are influenced by the interactional context.

References

- Calbris, G. (1990) *The Semiotics of French Gesture*. Bloomington: Indiana University Press.
 Kendon, A. (2004) *Gesture. Visible action as an utterance*. Cambridge, Cambridge University Press.

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Pointing regulated by the grammatical category of person in the village sign language Kata Kolok

Kata Kolok is a village sign language used by a rural community of North-Bali which is home to 47 deaf individuals as well as approximately 1,600 hearing signers (of varying proficiencies). The village has had a high incidence of deafness for long periods of time, and the recessive gene which causes deafness mutated up to twelve generations ago. Village sign languages like Kata Kolok are found to exhibit linguistic features previously unattested in well-documented urban sign languages. One of the anomalies found in Kata Kolok is its absolute conception of space (Perniss & Zeshan, 2008). Although there are modality-specific constraints on what the absolute Frame of Reference (FoR) may look like in spoken versus signed languages, both effectively constitute a 'bird's-eye view' independent of the signer's own viewpoint, or spatial properties of the referent itself. The dominance of the absolute FoR is evident in the direction of Kata Kolok pointing signs too, which are motivated by the topographical location of referents rather than assigned to a locus in sign space (Perniss & Zeshan, 2008). This holds for pointing signs expressing spatial, pronominal, and temporal referents (Kata Kolok has a celestial time line). This paper investigates the nature of pointing for person reference in particular. Based on a corpus of over 6,000 pointing signs stemming from 6 hours of transcribed natural conversation, I present new data that reveals the ways in which pronominal pointing is restricted by the grammatical category of person in Kata Kolok. First of all, there is evidence of first person category contrasting to non-first persons in Kata Kolok as 1st person reference is done by the full hand, while reference to other types of referents must be done by the index finger. Secondly, in contrast to previous descriptions of Kata Kolok, I have found new evidence showing that although 3rd person referents cannot be assigned a locus in sign space, one may evoke an absent addressee (2nd person) by pointing to the canonical position of an addressee (i.e. the space directly in front of the signer). This type of pointing is marked by raised eyebrows and a forward head tilt, as one might be in an actual conversation. Third person point cannot be located in the sign space in this way, which is paralleled by the absence of spatial agreement morphology on transitive verbs. Thirdly and finally, it is shown that 3rd person referents, but not 2nd persons, may be projected onto the finger tips; a phenomenon which has been described as list buoys in American Sign Language. This presentation ties in with previous work on the issue of grammatical person in urban sign languages, as well as recent work suggesting that village sign languages may deploy sign space in radically different ways than urban sign languages. It becomes clear that we are at the beginning of exploring the typologically diverse ways signed languages may conceive of space. Notwithstanding, space seems crucial to understanding the possible evolutionary tracks signed languages may take in their course of linguistic development.

References

Perniss, P., & Zeshan, U. (2008). Possessive and existential constructions in Kata Kolok. In *Possessive and existential constructions in sign languages*. Sign Language Typology Series No. 2. Nijmegen: Ishara Press.

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Panel presentation

The neuroscience of gesture is a young, exciting and fast developing field that promises to lead to major insights into the brain structures and functions underlying gesture production and processing. The growing body of research in this field provides the empirical basis for developing cognitive theories on gesture perception and production. These findings are not only relevant to gesture research per se, but to cognitive neuroscience more generally, by promoting gesture research as a vehicle to understand other cognitive processes such as language, spatial cognition, prosody as well as emotional processes.

In order to gain an insight into the neurocognition of gesture, we have assembled nine speakers who will discuss a wide spectrum of research topics and methodologies currently used in neuroscientific gesture research. The spectrum of topics extends from Gesture production via Embodied Cognition and Kinesthetic Empathy to Gesture and Language Comprehension.

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Gesture production in the right and left hemispheres during narration of short movies

Gestures accompanying verbal speech are a ubiquitous feature of human communication. However, surprisingly little research has been done on the neurobiological structures underlying this behaviour. Previous results have shown that the production of different gesture types are linked to different brain regions (Lausberg, Zaidel, Cruz & Ptitto 2007), therefore the present project aims to gain more insight into the question of how the hemispheres interact with regard to gesture production. 60 subjects were examined and divided into three different groups: 20 subjects suffered from a brain lesion in the left hemisphere, 20 suffered from a brain lesion in the right hemisphere, while the remaining 20 participants served as healthy control subjects. Two movie clips were presented to the subjects. Subsequently, subjects described the observed clips to the experimenter. No specific instructions regarding the use of gestures were given to the participants; thus only spontaneous gesturing was analyzed. The clips consisted of short scenes involving the comical character Mr. Bean and they served as a strong trigger to elicit gesturing in the participants. Gestures produced by participants were recorded using a DV video camera. As patients display special characteristics in their nonverbal behaviour due to acquired disorders like apraxia or hemiparesis, the Neuropsychological Gesture Coding System (NEUROGES) was applied for data analysis as it is particularly suitable for the examination of neurological patients (Lausberg & Sloetjes 2009). Two independent raters analyzed the gestures according to their gesture type and their function. Interrater agreement was calculated on 25% of the data and differences were resolved through subsequent consensus agreement. Preliminary results indicated that both patient groups not only differed strongly from the control group but also from each other with regard to choice of hand, frequency of gesturing as well as the specific types of gestures performed. The present results therefore further support our claim that different gestures are generated in different brain regions, indicating localized hemispheric specialization for gesture production.

References

- Lausberg, H., & Sloetjes, H. (2009). Coding gestural behavior with the NEUROGES--ELAN system. *Behavioral Research Methods*, 41(3), 841–849.
- Lausberg, H., Zaidel, E., Cruz, R. F., & Ptitto, A. (2007). Speech-independent production of communicative gestures: evidence from patients with complete callosal disconnection. *Neuropsychologia*, 45(13), 3092–3104.

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The influence of semantic impairment and of apraxia on nonverbal communication in severe aphasia

In treatment of language disorders, several approaches make use of gestures as compensatory strategy or for facilitating word retrieval. However, the prerequisites for a successful therapy remain unclear. Especially the relationship between limb apraxia and the ability to produce communicative gestures in conversation is not yet well understood.

In the present study, we investigated the relationship between nonverbal cognitive abilities, language disorder, and gestural communication in 24 speakers suffering from severe aphasia.

Video recordings were obtained of their narrations of short video-clips. The gestures they produced were analyzed in two ways: First, we transcribed them with a notation system for sign languages (HamNoSys; Prillwitz 1989) and determined the formal diversity of hand gestures. Secondly, we presented the recordings to healthy subjects and asked them in a forced-choice recognition paradigm to identify the video-clip that had been told. Apraxia was examined for pantomime of tool use and semantic capabilities were assessed by associating pictures according to semantic features.

Statistical analyses revealed that the severity of semantic impairment and of apraxia had a negative influence on the diversity and the comprehensibility of gestures, whereas linguistic capabilities assessed by the Aachen Aphasia Test (Huber et al. 1983) had no significant influence on either measure.

Our results indicate that impairment of non-verbal, mainly semantic, capacities rather than the severity of aphasia predict the efficiency of gestural communication of patients with severe aphasia.

References

- Prillwitz S, Leven R, Zienert H, Hanke T, Henning J. 1989. *Hamburger Notationssystem für Gebärdensprachen. Eine Einführung*. Hamburg: Signum Verlag.
Huber W, Poeck K, Weniger D & Willmes K. 1983. *Aachener Aphasia Test*. Göttingen: Hogrefe.

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Hands on syntax: Simple beat gestures influence a core aspect of language

The ability to generate (and comprehend) a limitless range of expressions on the basis of a limited vocabulary differentiates human language from non-human communication systems [1]. Syntax, i.e., a system of rules to construct sentences out of individually meaningful elements, is arguably the underlying basis that gives human language their expressive power. Here, we investigate whether simple beat gestures interact with the syntactic aspect of language. Stimuli consisted of German sentences that were temporarily ambiguous with respect to their syntactic structure. Only at the sentence-final word, these sentences were disambiguated, either towards a preferred (canonical) SOV structure, or towards a non-preferred (non-canonical) OSV structure. In addition to the word order (canonical SOV order vs. non-canonical OSV order), we manipulated whether the sentences were accompanied by a beat gesture (no beat, beat on the first ambiguous NP, beat on the second ambiguous NP). Based on the EEG from 63 scalp electrodes, event-related brain potentials (ERPs) for the six experimental conditions were calculated, time-locked to the onset of the critical disambiguating sentence-final word.

Previous research has shown that a disambiguation towards the non-canonical structure is associated with increased processing costs (e.g., longer reading times). Studies using ERPs found that when linguistic cues triggered a structural revision towards the non-preferred OSV structure, the difficulty of this revision is associated with a positivity peaking around 600 ms after the onset of the disambiguating word (P600, [2,3]). We hypothesized that beat gestures, with their natural ability to emphasize certain parts of speech, may reduce (or even abolish) the aforementioned processing costs associated with non-canonical OSV structures, by reducing the amplitude of the P600.

Results showed that when the speaker produced no beat gesture, sentences with a non-canonical word order were associated with a larger P600 than sentences with a canonical word order. This is in line with previous findings which have shown that in the absence of contextual cues, the simpler structural analysis of SOV is preferred [3]. A beat gesture accentuating the first ambiguous nominal phrase did not cause them to depart from this strategy, as indicated by an equally strong P600 effect of word order under these conditions. However, the P600 effect was abolished when beats supported the second ambiguous noun phrase, suggesting that the beat gestures of a speaker can increase the plausibility of an otherwise dispreferred OSV structure by emphasizing the subject of a sentence.

Thus, our results indicate that the small, seemingly insignificant flicks of the hand that speakers spontaneously produce have an impact on a core aspect of language comprehension. This finding has important theoretical consequences for our understanding of how gesture and speech are related in present-day humans, it may inform gesture-first theories of language evolution and extends existing theories of language comprehension.

References

- Fitch, W. T., & Hauser, M. D. (2004). Computational constraints on syntactic processing in a nonhuman primate. *Science*, 303(5656), 377–380.
Hagoort, P., Brown, C., & Groothusen, J. (1993). The syntactic positive shift (SPS) as an ERP measure of syntactic processing. *Language and Cognitive Processes*, 8, 439–483.
Knoeferle, P., Habets, B., Crocker, M. W., & Munte, T. F. (2008). Visual scenes trigger immediate syntactic reanalysis: evidence from ERPs during situated spoken comprehension. *Cerebral Cortex*, 18(4), 789–795.

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Do you understand dance? How the audience responds to gestures in dance and everyday actions

In my talk, I will outline the conditions under which a spectator does respond to unfamiliar gestures. The data presented is part of our interdisciplinary project 'Watching Dance: Kinesthetic Empathy'. We are exploring the audiences' response to watching dance by combining neuroscience and audience research. The term 'Kinesthetic Empathy' is commonly used in audience research to describe the emotional and kinaesthetic interaction between a spectator and a mover, but it is not yet clear what the neural correlates of Kinesthetic Empathy are.

In an attempt to answer this question we found neurophysiological differences between spectators when they were watching gestures and formal dance movements. In particular, we found evidence that empathic abilities change the perception of gestural actions. In this experiment, we measured participants' motor entrainment by assessing changes in their cortico-spinal excitability while they watched different styles of live performances. This was done by applying transcranial magnetic stimulation over their motor cortex and simultaneously measuring their muscular responses with electromyography. Post-hoc, participants' empathic abilities were measured by means of the interpersonal relationship index (IRI). Results showed that participants who scored high in the IRI showed enhanced cortex excitability when watching both Indian dance and an acting performance. Furthermore, the cortical excitability of spectators who frequently watch ballet (but have no dance training) was higher when they were watching ballet than other types of dance. Gestural actions were prevalent in both the Indian dance and the acting performance while ballet dance in general is based upon more formal or movements and highly transformed gestures. Thus, our findings provide evidence that different types of movements, i.e., formal and gestural, are processed differently. On a first level, high empathic abilities of a spectator enhance their engagement with the observed gestures. On a second level, visual experience increases the cortical response to formal movements. We propose that empathic abilities improve the understanding of familiar as well as novel gestures. In contrast, more formal movements are only understood by motor simulation when the spectator is visually familiar with those particular types of movement. These results are relevant to acknowledge the connection between human social interaction, the evolution of dance, and the application of sign language.

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Two visual pathways for integrating gesture and speech during language comprehension

Speech and gesture are believed to form an integrated system in language comprehension (Kelly, Özyürek & Maris, in press). However, little is known about what aspects of hand gesture are important for this integration. For example, it is not clear how much and what type of visual information is necessary to extract meaning from gestures that accompany speech. In the present study, we used a standard visual degradation technique (e.g., Hansen, Farivar, Thompson, & Hess, 2008) that presented different types of degraded gestures (filtered for low and high spatial frequencies) with speech to determine which visual pathway is optimally designed to integrate the two modalities during language comprehension.

Participants will watch videos of action primes (someone chopping vegetables) and bimodal speech and gesture targets that are congruent (Speech: "CHOP"; gesture: CHOPPING) or incongruent (Speech: "CHOP"; gesture: TWISTING). The targets will be visually degraded using a spatial filtering technique, with half of the targets containing only high spatial frequency information (HSF) and the other half containing only low spatial frequency information (LSF) (Munhall, Kroos, Jozan, & Vatikiotis-Bateson, 2004). The task will be to identify whether the speech content of the targets is congruent or incongruent with the primes.

In accordance with previous work, we expect participants to identify incongruent targets more slowly and less accurately than congruent targets. In addition, because large-scale movements (versus fine grained movements) are best processed by low-frequency visual pathways, we predicted an interaction in which the difference between congruent and incongruent targets would be greater in the LSF versus HSF condition. Pilot data on the LSF stimuli suggest that even when highly degraded (e.g., 1.0 octave), LSF gestures influence speech processing.

If the predictions are confirmed, they would suggest that gesture and speech are optimally integrated in low-frequency visual pathways that perhaps rely on sub-cortical mechanisms (e.g., in the domain of emotion, see Vuilleumier, Armony, Driver, & Dolan, 2003). This would be interesting in light of research demonstrating that fine-grained movements (e.g., lip movements) are integrated with speech best with high versus low-frequency visual information (Munhall et al., 2004). More generally, it would help clarify the claim that gesture-speech integration is an automatic neural process (Kelly, Creigh & Bartolotti, in press).

References

- Hansen, B. C., Farivar, R., Thompson, B., & Hess, R. F. (2008). A critical band of phase alignment for discrimination but not recognition of human faces. *Vision Research*, 48, 2523–2536.
- Kelly, S. D., Özyürek, A., & Maris, E. (in press). Two sides of the same coin: Speech and gesture mutually interact to enhance comprehension. *Psychological Science*.
- Kelly, S. D., Creigh, P., & Bartolotti, J. (in press). Integrating speech and iconic gestures in a Stroop task: Evidence for automatic processing. *Journal of Cognitive Neuroscience*.
- Munhall, K. G., Kroos, C., Jozan, G., & Vatikiotis-Bateson, E. (2004). Spatial frequency requirements for audiovisual speech perception. *Perception & Psychophysics*, 66, 574–583.
- Vuilleumier, P., Armony, J. L., Driver, J., & Dolan, R. J. (2003). Distinct spatial frequency sensitivities for processing faces and emotional expressions. *Nature Neuroscience*, 6, 624–631.

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The anarchic hand: The left hand and autostimulative gestures

Autostimulative gestures are a regularly occurring phenomenon in communicative situations, and their frequency ranges between 30–70% of all hand gestures in different communicative contexts. It has been suggested that autostimulative gestures serve self-regulation in stressful situations. However, little is known about the neurobiological correlates of their production. Because spontaneous hand preferences reflect a hemispheric specialization in the production of hand gestures, in the present study, we systematically investigate hand preferences for different types of autostimulative gestures as compared to communicative gestures.

Right-handed subjects were examined during dyadic interviews and during monologue narrations. The video-taped gestural behaviour was evaluated with the NEUROGES-ELAN system by two independent blind raters.

Among the autostimulative gesture types, a marginally significant left-hand preference was observed for self-touch, whereas a significant right-hand preference was found for body-adjacent object manipulations. Among the 20 types of communicative gestures, a significant right-hand preference was found for deictics, kinetographs, pantomimes, positionings, and tracings.

The left hand preference for self-touch strongly suggests that these types of hand gestures are generated in the right hemisphere. As the right hemisphere is critically involved in emotional processes, the execution of self-touch gestures with the left hand is compatible with the assumption of a self-regulatory function of self-touch gestures when experiencing stress and anxiety. In contrast, in the case of body-adjacent object manipulations – though also of an autostimulative nature – the subjects' right-handedness, i.e. their right-hand preference for tool use, seems to be the dominant factor. In the same line, among the communicative gesture types, the outstanding right-hand preference for pantomimes, positionings, and tracings is plausibly related to the subjects' right-hand preference for tool use.

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Show your hands – Are you really brainy? Gesture production, intelligence, and brain structure

Gestures are part of the communication system. Additionally, representational gestures reflect thinking processes. The aim of this study is to clarify the relation of gesture production, cognition, and underlying brain structure. Differences between individuals with different spatial abilities indicate a positive relationship between gesture production and cognition. However, it is yet unclear whether more general cognitive ability, such as fluid intelligence, is also related to gesture production. Fluid intelligence is the ability to perform very efficiently in problem-solving tasks due to the ability to select the task-relevant information very quickly and to focus on task relevant cognitive operations. Brain activity in Broca's area is linked to gesture comprehension and production. Moreover, cortical thickness of the pars opercularis in Broca's area is also positively related to intelligence. Because of the previous findings we expected that participants with higher fluid intelligence should produce more representational gestures and present with larger cortical thickness in Broca's area compared to those with lower fluid intelligence. We assessed gesture frequency and cortical thickness in two groups of adolescents differing in fluid intelligence. The two groups were comparable in relevant demographical factors and scores on a verbal intelligence test. First, participants solved an analogy task at a computer without using speech or gestures. They judged whether or not two chessboard-like patterns on the right of the screen were mirrored on the same axis as two patterns on the left of the screen. Afterwards, they were asked to explain how they proceeded in this task. These explanations were video-taped, gestures were coded with the Neuropsychological Gesture Coding System (NEUROGES), and speech was transcribed verbatim. In another session, structural magnetic resonance imaging data were collected. Cortical thickness was estimated by calculating the distance between the reconstructed boundary of white and grey matter and the cortical surface in each individual in the submillimeter range. As expected, individuals scoring higher in fluid intelligence produced more representational gestures, in particular gestures that expressed movement. Interestingly, the two groups did not differ in how they referred to movement in speech. Individuals with higher fluid intelligence also showed larger cortical thickness values in some regions in the left hemisphere (pars opercularis in Broca's area, superior frontal, and temporal cortex) than individuals with lower fluid intelligence. Moreover, the left pars opercularis in Broca's area and left transverse temporal cortex showed larger cortical thickness values in participants who produced representational gestures compared to those who did not. Our results thus indicate that cortical thickness of those brain regions is positively related to both, fluid intelligence and the production of gestures. Results are discussed within the gestures-as-simulated-action framework that states that gestures result from simulated perception and simulated action that underlie embodied language and mental imagery. Thus, individuals with high fluid intelligence might reveal more simulated actions than their peers. The findings expand our knowledge about gesture production beyond their relationship with speech and spatial skills to the domain of fluid intelligence as a general cognitive ability. We discuss possible underlying mechanisms of this relationship.

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The processing of iconic and metaphoric co-verbal gesture: Common and unique neural integration processes

Different types of gestures vary in their relation to language. Iconic and metaphoric gestures both illustrate spoken sentences, but do so in unique ways. Iconic gestures refer to the concrete content of sentences, whereas metaphoric gestures illustrate abstract information (1). Up to now it is unclear, how these different co-verbal gesture types were processed in the brain. Recent research on the neural integration of speech and gesture has examined either gesture in the context of concrete (e.g., iconic gestures; 2, 3) or abstract sentence content (e.g., metaphoric gestures; 4, 5). However, there has not yet been a direct comparison of the neural processing of both gesture types. This study tested the theory that left posterior temporal and inferior frontal brain regions are each uniquely involved in the integration of iconic and metaphoric gestures. During fMRI-data acquisition, participants were shown videos of an actor performing iconic (IC) and metaphoric gestures (MP) and associated sentences. An isolated gesture (G) and isolated sentence condition (S) were included to separate unimodal from bimodal effects at the neural level. During IC conditions we found increased activity in the left posterior middle temporal gyrus and its right hemispheric homologue. The same regions in addition to the left inferior frontal gyrus were activated during MP conditions in contrast to the isolated conditions (G & S). Behavioral results indicated that both iconic and metaphoric co-verbal gestures lead to better memory performances for spoken sentences, supporting the assumption that successful integration processes took place. These findings suggest that there are common and distinct integration processes for iconic and metaphoric gestures. In line with recent claims of the semantic unification theory (6) there seems to be a division between perceptual-matching processes within the posterior temporal lobe and higher order relational processes within the inferior frontal gyrus. The results will be discussed with regard to new findings about the neural processing of deictic and abstract deictic in comparison to iconic and metaphoric co-verbal gestures. Together, our results demonstrate the importance of abstractness with regard to the neural processing of speech and gestures.

References

- McNeill D (1992). *Hand and mind: What gestures reveal about thought*. Chicago: University of Chicago Press.
- Green A, Straube B, Weis S, Jansen A, Willmes K, Konrad K, Kircher T (2009) Neural integration of iconic and unrelated coverbal gestures: A functional MRI study. *Human Brain Mapp.* 30:3309 – 3324.
- Holle H, Gunter TC, Ruschemeyer SA, Hennenlotter A, Iacoboni M (2008): Neural correlates of the processing of co-speech gestures. *Neuroimage* 39:2010–2024.
- Kircher T, Straube B, Leube D, Weis S, Sachs O, Willmes K, Konrad K, Green A (2009): Neural interaction of speech and gesture: Differential activations of metaphoric co-verbal gestures. *Neuropsychologia* 47:169–179.
- Straube B, Green A, Weis S, Chatterjee A, Kircher T (2009). Memory Effects of Speech and Gesture Binding: Cortical and Hippocampal Activation in Relation to Subsequent Memory Performance. *Journal of Cognitive Neuroscience*, 21, 821–836
- Hagoort P, Baggio G, Willems RM (2009): Semantic unification. In: Gazzaniga MS, editor. *The Cognitive Neurosciences IV*. Cambridge: MIT Press.

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Co-speech gestures facilitate language comprehension by reducing subsequent reliance on brain regions associated with early sensory processing

How do co-speech gestures aid in language comprehension? It is proposed that observed gestures are associated with processing in brain regions involved in the production of hand and arm movements (Skipper et al., 2009) because of the predictive ability of motor cortex (Skipper et al., 2006). The brain predicts, e.g., forthcoming words associated with observed gestures. These predictions constrain interpretation and allow the brain to expend less time processing incoming sensory information, allowing resources to be allocated elsewhere. This model was tested using functional magnetic resonance imaging (fMRI) while participants watched a television game show containing natural co-speech gestures. It was hypothesized that 1) Gestures would be associated with additional processing in brain regions involved in the production of movement and areas involved in semantic aspects of spoken language comprehension (e.g., anterior superior temporal cortex; STa); 2) Processing in production areas associated with gestures would temporally precede activity in language comprehension areas if the motor system is engaged in a predictive capacity; and 3) There would be a concomitant decrease in processing in early sensory cortices, i.e., areas of cortex that are a relatively few number of synapses away from peripheral sensory receptors. These hypotheses were tested with a new fMRI analysis method called turnpoints analysis. Turnpoints analysis allows researchers to analyze timeseries data resulting from naturalistic stimuli rather than use the subtractive technique typically employed in fMRI studies that must make use of tightly controlled stimuli. This method was developed because of the difficulty of creating stimuli containing artificial co-speech gestures that maintain the intricate timing relationship between speech and gesture. Results indicate that, relative to speech alone, co-speech gestures were more associated with processing in pre- and primary motor (PM) and STa cortex. Hand and arm movements not associated with speech (e.g., self-adaptor movements and buzzer presses) were not associated with processing in PM or STa cortex but, rather, with processing in visual and parietal areas. Activity in PM cortex associated with gesture preceded activity in STa cortex. Finally, relative to speech without gesture, there was a marked decrease in processing in early sensory areas when gestures were observed (e.g., in Heschel's gyrus and the calcarine fissure, usually associated with primary auditory and visual cortex respectively). Ancillary analyses show that the reduction of processing in sensory areas is a function of the amount of semantic content contained in gestures and a more general property of language comprehension when preceding discourse content highly semantically constrained the predictability of forthcoming words. In conclusion, gestures seem to be used by the brain to predict forthcoming words associated with those gestures and this results in a decrease in processing in early sensory areas. This is likely because less evidence is required from early sensory areas to confirm what the talker is attempting to say. Thus, gestures would seem to aid in language comprehension by freeing up brain resources to perform other functions, e.g., processing associated with further elaboration of a talker's intended meaning.

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References

- Skipper, J. I., Goldin-Meadow, S., Nusbaum, H. C., and Small, S. L. (2009). Gestures orchestrate brain networks for language understanding. *Current Biology*, 19(8), 661–667.
- Skipper, J. I., Nusbaum, H. C., & Small, S. L. (2006). Lending a helping hand to hearing: Another motor theory of speech perception. In M. A. Arbib, (Ed.). *Action to Language Via the Mirror Neuron System*. Cambridge University Press, Cambridge, MA. 250–285.

Pamela Perniss (Coordinator)
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Panel presentation

This panel explores the conventionalization of spatial language (i.e. talking about space with space) in the visual-spatial modality. Signed languages, which use space for linguistic expression, are shaped by the iconic affordances of the modality. Information about entity location, number, motion, and type can be mapped onto space through the placement, movement, and shape of the hands. Such visual-to-visual mapping makes spatial representation in the visual-spatial modality appear straightforward. This notion is underscored by the assumption of homogeneity in spatial language across signed languages (Aronoff et al. 2003; Meier 2002) and of similarity between signed languages and gesture (Liddell 2003; Schembri et al. 2005). This panel investigates the challenges to successful communication of spatial information in the visual-spatial modality by pitting the modality's iconic affordances against the requirements of conventionalizing form, meaning, and syntax. We compare the linguistic systems of three sign languages with communication in three conditions (pantomime, L2 learners of sign, and homesign) that differentially highlight two important factors contributing to conventionalization ('time on task' and 'critical mass'). The first contribution compares descriptions of object configurations by native signers of German Sign Language (DGS) and by German speakers in a voice-off, pantomime condition. We investigate strategies devised by people provided with the 'raw material' of the visual-spatial modality, but unaccustomed to its use as the sole means of communication (i.e. with extremely limited 'time on task'), and look at similarities and differences to the conventionalized spatial structures of a sign language. The second contribution looks at hearing learners of British Sign Language (BSL) – who have considerably more 'time on task' than the pantomimers – and compares efficiency and accuracy of spatial descriptions with those produced by native BSL signers. The comparison provides insight into the interplay between gradient ('gestural') and discrete ('linguistic') properties of classifier predicates, and draws attention to the challenges of learning the conventionalized semantics of iconic forms. Lastly, we look at homesigners (i.e. deaf individuals living in isolation from other deaf people), who have ample 'time on task', but lack a 'critical mass' to drive conventionalization. In the third contribution, we examine the expression of number and spatial arrangement in homesigners in Nicaragua. The homesigners use both iconic and more arbitrary forms, and crucially, integrate these forms into sentences that display the same ordering patterns as their non-number sentences. The study demonstrates that fully conventionalized language is not necessary to create linguistic devices that capture the conceptual distinctions that underlie number (e.g. one vs. many). The final contribution compares descriptions of events (transitive and intransitive) which require consistent spatial mapping and reference by homesigners in Nicaragua and signers of Nicaraguan Sign Language (NSL). The investigation highlights the role of the homesigners' communication partners in supplying pragmatic inferences to comprehend the use of spatial structures lacking in systematicity and conventionalization. Tracking changes in spatial language from purely gestural expressions to sign language can inform us about the evolution of language within the visual-spatial modality and about the contribution of gesture to that process.

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Attempts at expressing verb agreement in older Nicaraguan home signers: Limits on the system?

Deaf individuals cut off from a deaf community and interacting with hearing people who do not know signed language have been shown to use extended gesture systems (homesign) which exhibit language-like qualities (Goldin-Meadow, 2003). It has been argued that analysis of this communication can tell us more about what the child's contribution to language development is, as well as how far an individual child (as opposed to a society) can go in fashioning a linguistic system out of gesture? Are there certain types of constructions and uses that can only be introduced into a language system with group support? (Goldin-Meadow, 1999, 428). The current study addresses this important question. We asked a group of 10 adult homesigners (aged 15-45 years) living in isolation from other deaf people, to describe a range of events they saw on a video. The events involved humans carrying out transitive and intransitive actions with each other (e.g. the man passed a book to a woman who then started to read it). The descriptions were relayed by the homesigner to an everyday conversation partner (a close hearing friend or hearing family member). We also collected the same descriptions from a group of adult fluent signers of Nicaraguan Sign language (NSL). The homesigners used a range of devices for explaining who did what to whom including idiosyncratic homesigns, emblems, spoken words, points and role shift. When we scored the productions for their information content the full meanings of many of the events tested were not recoverable solely from the homesigners' productions. The majority of the communication was not self-explanatory and relied on the conversational partners' skill in co-constructing the event from a series of piece-meal descriptions from the homesigners. We compared the use of homesign and full blown NSL for the use of a signing space to express grammatical and semantic relations through verb agreement, concluding that in this group of homesigners while the concepts being expressed were clearly understood by the participants involved, their system is not powerful enough to describe all the events in a systematic or conventionalised manner. There were clear limits in how much information could be encoded in the homesign without great recourse to interlocutor assistance and interpretation. We discuss the role of critical mass of users and time on task for the development of sign language grammar.

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Breaking into sign language: The gestural and visuo-spatial properties of classifier constructions in British Sign Language aid their acquisition by adult hearing learners

In sign languages the main parameters of phonology are the configuration of the hands (handshape, orientation), their location in space and their movements. In many signs these parameters are individually meaningless. However, in particular morphologically complex constructions involving entity classifiers, they can all bear meaning. For example, in British Sign Language (BSL), “the car is located next to the bike” can be expressed using the lexical signs for CAR and BIKE, then two B (flat) handshapes, one oriented with the palm down (the classifier for CAR) and the other with the palm at 90° (BIKE), placed next to one another in signing space with a short sharp downward movement.

There is dispute over the extent to which entity classifiers are motivated by the visual and spatial properties of the objects that they encode, a dispute that pits the gradient, “gestural”, aspects of sign language against the more categorical, “linguistic”, aspects. Classifiers have a long acquisition path in L1 acquisition, but there has been little work in L2 acquisition. The present study tests the hypothesis that the aspect of entity classifiers that is most strongly visually motivated (location) will be more easily acquired by adult learners of BSL than those aspects that are more categorical in nature (handshape, orientation).

We tested 12 adult hearing learners of BSL (aged 22–42, mean 29; at beginner/intermediate level). The task involved participants watching two pictures in quick succession on a laptop screen, after which they were asked to explain in BSL what was different between the two pictures. In each task we tested two types of classifier construction that involve entity classifiers: verbs of location (i.e. X IS AT Y), and distributive plural forms. Learners’ productions were scored for accuracy in location, handshape and orientation, in comparison to the productions of five adult native and near-native signers (four deaf and one hearing).

Learners of BSL succeeded in encoding the location information in verbs of location and in distributive plurals, but they did not always use conventional handshapes and orientations. Alongside classifier handshapes, learners also used their index finger to point to locations, lexical preposition signs, and a flat handshape that was used across semantic classes to mean “is located here”. They also showed a tendency to express meaning sequentially rather than simultaneously.

The results show that adult learners of BSL bring sophisticated visuo-spatial knowledge and their gestural abilities to the task of producing constructions that contain entity classifiers. However, although the visuo-spatial and gestural properties of classifier constructions in BSL aid their acquisition, knowing which classifier handshapes to use, and how to express morphology simultaneously, are aspects that need to be learnt, and that are challenging for adult learners.

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Conventionalization of spatial representation in the visual-spatial modality: From pantomime to sign language

The visual-spatial modality used in signed language is unique in its affordance of visual-iconic representation. The possibility of visual-to-visual mapping in signed language makes spatial representation appear straightforward (Emmorey, 2002). Indeed, spatial representation is assumed to be similar across signed languages (Meier 2002), as well as between gesture and sign (Liddell 2003). However, there has been little investigation of what the visual-spatial modality offers as ‘raw material’ for spatial representation, outside of a linguistic context (Schembri et al. 2005). If spatial representation in the visual-spatial modality relies primarily on general affordances of the modality, then individuals unaccustomed to the visual-spatial modality as the sole means of communication should exhibit sign language-like form and structure in communicating about spatial relationships. To investigate this question, we compare descriptions of Figure-Ground object configurations (e.g. the cup is on the table; the pen is next to the paper) by deaf signers of German Sign Language (DGS) and by hearing German non-signers in a voice-off, pantomime condition.

We elicited spatial descriptions from 12 native DGS signers and 10 German non-signers asked to pantomime. Participants described pictures in which single or multiple (i.e. 1, 2, 3–4, or many) tokens of entities (e.g. cups, plates, cows, boats) were arranged in various spatial configurations (e.g. on, next to). For both sign language and pantomime, we coded for the use of different forms to identify and locate referents, and for the presence of spatial cohesion devices.

The results reveal similarities, but many important differences in the expression of spatial relationships between sign language and pantomime. Like the DGS signers, the pantomimers used space to mark entity locations, often outlining the shape of entities in certain locations (i.e. with size and shape specifier-like forms). However unlike signers, pantomimers located referents primarily by pointing to locations and by using handshapes that represented the manipulation of an entity (i.e. handling classifier-like forms), while using very few handshapes that represented entities as a whole (i.e. entity classifier-like forms). Furthermore, while signers showed cohesion and consistency in the use of space for coreference, pantomimers were less systematic in this regard. Finally, pantomimers used space to indicate the number of entities of a certain type, as did the signers, but they did not consistently use numeral handshapes to indicate number, which was very frequent in the signed descriptions.

These findings demonstrate that the ‘raw material’ of the visual-spatial modality does provide a rich stock of iconic devices that are accessible and exploitable by people unaccustomed to its use as the sole means of communication. However, these affordances do not result immediately in full-blown linguistic ways (as in the established system of DGS) of expressing spatial relations. The findings highlight the role of linguistic conventionalization and categorical abstraction in linguistic systems, which “seem” straightforward in a visual communication system in which space is used to talk about space.

References

- Emmorey, K. (2002). *Language, cognition and the brain*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Liddell, S.K. (2003). *Grammar, Gesture, and Meaning in American Sign Language*. Cambridge: Cambridge University Press.
- Meier, R.P. (2002). Why different, why the same? Explaining effects and non-effects of modality upon linguistic structure in sign and speech. In: Meier, R.P. et al. (Eds.), *Modality and structure in signed and spoken languages*. Cambridge: CUP, pp. 1–25.
- Schembri, A. et al. (2005). Comparing Action Gestures and Classifier Verbs of Motion: Evidence From Australian Sign Language, Taiwan Sign Language, and Nonsigners’ Gestures Without Speech. *J. of Deaf Studies and Deaf Education* 10(3): 272–290.

Gary Morgan (Coordinator)
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Panel presentation

This panel explores the development of language in a range of children acquiring different spoken languages. For children in the early stages of spoken language development gesture may carry a larger share of the communicative burden. Indeed gestures have been shown to be important predictors of linguistic and cognitive development (e.g., Bates, 1976; Volterra & Erting, 1994; Rowe & Goldin-Meadow, 2009). Cross cultural studies suggest that all children, regardless of their primary linguistic input use gestures together with speech in early stages of linguistic development. But culture and adult input may influence the extent to which the body is used for representational purposes (Blake et al., 2005). In young children motor representations may support linguistic representations in speech. In particular representational gestures for describing attributes of objects and actions have been observed in the first two years of life. Children acquiring signed languages also use holistic action gestures to bootstrap into more conventionalised verb meanings (Morgan, Herman, Barriere & Woll, 2008). Performing a gestural motor representation may be necessary to create a more experiential dimension and a more precise and concrete image linked to the word. The present series of four papers uses a parallel methodology to explore this possibility further. We compare performance by pre-school children in Italy, Japan and England on the same picture naming task (Bello, Caselli, Pettenati & Stefanini, 2009). The data in the three countries were collected in comparable settings and spoken and gestural productions were analyzed according to the same criteria. The first contribution focuses on Italian 2-7 year olds and the developmental changes in their use of representation and pointing gestures in the picture naming task. In the three studies reported children's speech and gesture are shown to work in concert. The second contribution looks at 2-3 year old Japanese children's performance on the picture naming task compared with data from the original Italian study. Japanese children produced less correct spoken responses but more representational gestures than Italians. The results are discussed in terms of the characteristics of interaction between child and caregiver in both cultures. The third talk switches to British English 2-3 year olds on the same picture naming task and describes representational gestures and pointing used in comparison with Italian and Japanese children. There were comparable amounts of representational gestures used especially for 'pure' action meanings e.g. 'swimming' and 'throwing'. Some data are described for bilingual children on the task. The panel concludes with a discussion paper by Volterra and Woll on the similarities and differences between children from various languages and cultures learning to use spoken language. Some motor characteristics of co-speech gestures shared by British, Italian and Japanese children resemble early signs for describing objects and actions produced by child native signers. Motor patterns identified in early sign development may also extend to gestural development in non signing children. The discussion raises implications for the notion of the continuum from action and gesture to sign and word in language acquisition.

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Types and forms of gestures produced by children aged between 2 and 3 years within a naming task: Cross linguistic and cross cultural differences

Research has firmly established the importance of gesture use in early language development in children from before the emergence of first words to the transition to the two-word stage. However, relatively little is known regarding the role of gesture in speech beyond this stage, as children's spoken repertoires are expanding. Therefore the aim of this study was to investigate the types and forms of gestures produced by English children between 2 and 3 years of age in the context of a lexical naming task which has been used previously with Italian and Japanese speakers of the same age (Stefanini, Bello, Caselli, Iverson and Volterra, 2009). This study aimed to establish the naming abilities of English speaking children when both the gestural and verbal modalities are taken into account. Twenty nine English speakers (age range: 29-34 months, mean: 31.33 months) participated in the study. We also collected data from 12 bilingual children within the same age range. The task comprised a comprehension part, where children were required to identify pictures of objects and actions, and a production part, where children were required to name pictures of objects and actions. Children's responses were analysed in terms of language ability (correct, incorrect, no-response) and gestural productions (type and form). Children performed better within the comprehension task than the production task, and significantly more gestures were produced within the comprehension task than the production task. A trend between spoken naming ability and gestural production was observed. The majority of gestures produced within both tasks were deictic pointing gesture and significantly more gestures were produced with speech in the production task. Much individual variation was evident in the specific handshapes employed. Comparable numbers and types of representational gestures were produced to previous reports for Italian and Japanese children of the same age. Children between the ages of 2 and 3 years continue to use gestures to accompany their spoken responses during a naming task. The effects of children's status as monolingual or bilingual on children's gestures are discussed. Representational gestures are hypothesised to play an important role in the naming process by creating a cognitive/sensory-motor link between the object or action depicted within the picture and the spoken word.

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Co-speech gestures in a naming task by Italian children: Form and function

The present series of studies started from the observation that, when asked to provide verbal labels for pictures in the context of a naming task “Parole in gioco” – PinG- (Bello, Caselli, Pettenati and Stefanini, in press), preschool children often accompanied their speech with gesture. In Study 1 we examined developmental changes in speech and gesture use and showed that young children between 2 and 7 years of age often produced pointing and representational gestures together with spoken responses. An analysis of developmental trends indicated that age is the strongest predictor of the number of gestures produced, but the number of correct spoken responses also accounted for a significant proportion of residual variance. A more detailed analysis indicated that only deictic gestures decreased with spoken naming accuracy while representational gestures did not show a similar and clear trend (Stefanini, Bello, Caselli, Iverson & Volterra, 2009). In Study 2 conducted with the same lexical task, we explored the form of 128 representational co-speech gestures produced by 45 hearing children (age range 24–37 months) focusing just on five pictures depicting objects and five pictures depicting actions. Gestures have been analyzed with the same parameters used to describe signs produced by deaf children: handshape, location and movement. Results show that gestures, for a given picture, exhibit similarities in many of the parameters across children and that some motor constraints, found in the production of first signs of a sign language also apply to representational gestures produced by hearing toddlers. Implications of similarity between gestural and signed linguistic representations in young children are discussed (Pettenati, Stefanini and Volterra, in press). In Study 3, conducted on the same repertoire of gestures of Study 2, we explored semantic match/mismatch and temporal synchrony/asynchrony relationship between spontaneous gestures and speech by using ELAN. The results demonstrate that gestures and speech mainly convey similar meanings and that the gestural stroke was produced synchronically with speech in the majority of cases. Onset time appears to be influenced by the item: gestural production tends to be produced before the spoken word onset in front of pictures depicting actions, but after in front of pictures depicting objects/animal. All the results taken together indicate that acts of speaking and gesturing are bound to each other at a general level and operate as an inseparable unit reflecting different semiotic aspects of the cognitive structure that underlies them both.

References

- Bello, A., Caselli, M. C., Pettenati, P., Stefanini, S. (in press). Parole in gioco: una prova di comprensione e produzione lessicale. Firenze, Giunti O.S.
- Pettenati, P., Stefanini, S., Volterra, V. (in press). Motoric characteristics of representational gestures produced by young children in a naming task. *Journal of Child Language*.
- Stefanini S., Bello A., Caselli M.C., Iverson J., Volterra V. (2009). Spoken and gestural lexicon in a naming task: developmental data. *Language and Cognitive Processes*, 24 (2), 168–189.

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Production of representational gestures in Italian and Japanese children

Cross cultural studies so far suggest that all children, regardless of their primary linguistic input use gestures together with speech in early stages of linguistic development. But culture and adult input may influence the extent to which the manual modality is used for representational purposes. Many studies have reported more frequent production of representational gestures by Italian children who are immersed in a ‘gesture-rich’ culture (Kendon, 2004). In particular, the representational gestures produced by Italian children include numerous object and action gestures (e.g., eating) and attributive gestures (e.g., big), whereas American children almost exclusively produce conventional gestures (e.g., hi, yes) (Iverson et al., 2008).

Previous Studies have yet to examine representational gestures within a large population as well as to investigate cultural influences in gesture production. They did not compare gestures produced by children raised in different cultures and exposed to different languages to represent the same referents. The present study is designed to address this issue by investigating the spontaneous production of gestures in a highly constrained, simple picture naming task (Stefanini et al., 2008) performed by children from different countries and languages. Given that Japanese culture has been never described as gesture-rich like the Italian culture, it is quite possible that young Italian children use a repertoire of gestures larger than the repertoire developed by Japanese children.

Method and Discussion: Two groups of 22 children, Italian and Japanese children (age range: 25–37 months) matched for age and gender performed the same picture naming task consisting of forty six coloured pictures divided into two sets: a set of 24 pictures representing objects/tools (e.g. comb), animals (e.g. lion), food (e.g. banana) and clothing (e.g. gloves), and a set of 22 pictures representing actions (e.g. eating) and characteristics (e.g., small). The data were collected in comparable settings for the two groups of children, and spoken and gestural productions were analyzed according to the same criteria.

Results: Both groups of children produced representational gestures with and without spoken responses. With representational gestures, children performed or reproduced the action usually produced with the object depicted (e.g. the comb), the character depicted (e.g., the lion) or the action in the picture itself (e.g. to swim). In both groups the majority of gestures depicted actions, whereas gestures for size and shape were quite rare. We found differences between the two groups in naming the spoken accuracy as well as in the number of representational gestures. The results indicate that, contrary to our expectations, Japanese children produced less correct spoken responses but more representational gestures than Italian children. In young children motor representations appear to support linguistic representations in speech: performing a gestural motor representation may be necessary to create a more experiential dimension and a more precise and concrete image linked to the word. Representational gestures produced in a naming task appear, therefore, to be linked to motor experiences common to all children. Results were discussed in terms of the characteristics of interaction between child and caregiver in both cultures.

References

- Kendon, A. (2004). *Gesture. Visible action as utterance*. Cambridge: Cambridge University Press.
- Iverson, J. M., Capirci, O., Volterra, V. & Goldin-Meadow, S. (2008). Learning to talk in a gesture-rich world: Early communication of Italian vs. American children. *First Language*, 28(2), 164–181.
- Stefanini, S., Bello, A., Caselli, M. C., Iverson, J. M., & Volterra, V. (2009). Co-speech gestures in a naming Task: Developmental data. *Language and Cognitive Processes*, 24(2), 168–189.

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Discussion paper: The shared roots of gesture and sign: Evidence from children's co-speech gestures

For children who are in an early stage of spoken language development gesture may carry a larger share of the communicative burden. It is possible that gestures produced by children, who are still in an early stage of lexical development, exhibit some linguistic properties such as symbolization, conventionality, formal characteristics which are not yet completely stabilized in the spoken modality. As speech (in the vocal modality) increases, taking on well defined linguistic properties, gesture (in the manual modality) does not take on these correspondingly properties except in situations in which the use of the vocal modality is prevented (McNeill, 2005). These properties may reflect modality-independent cognitive processes which only get allocated to the spoken or gestural modality depending on experience and linguistic input children are exposed to.

As reported by Adam Kendon (2004) the forms of expression in gesture have much in common with certain forms of expression in primary sign languages and there is a common ground between gesture and sign. This assertion does not challenge the well established distinctions between gestures and signs. The findings across this set of studies provide evidence that hearing children produce similar forms of gestures for a common image and that some motor patterns identified in early sign development may also extend to gestural development in non signing children. Such a result could have interesting implications for the notion of a continuum between gestures and signs and the evolution of signed languages.

Tyler Wereha (Coordinator)

Simon Fraser University, Burnaby, Canada

Panel presentation

Developmental researchers study behaviour through both naturalistic and experimental methods. Despite recognition that both of these methods are important and complementary in science, there still seems to be tension between researchers who identify more with one camp more than the other. Despite the conspicuous overlap between these disciplines, the long standing debates between ethologists and comparative psychologists date back to the late 18th century (see Jaynes, 1967) and show no sign of ending in regards to the current study of primate joint attention (Boesch, 2007; 2008; de Waal et al., 2008; Herrmann et al., 2007; Tomasello & Call, 2007). Despite recognition that both field and laboratory methods are needed (Tomasello & Call, 2007) debate persists between researchers who make qualitative comparisons in the gestural communication and joint attentional skills of human and non-human primates. Boesch (2007) argues that much research does not take into account within species variability, and that methods used to make these comparisons systematically differ between species. One of the most salient implications for understanding the development of these skills is for interpreting the significance of rearing histories of non-human primates. The purpose of this series of talks is to elucidate the issues in this debate, and hopefully, move past them. The speakers in this series will present their analyses from their respective backgrounds in laboratory and ethological research, and offer broader historical and conceptual analyses of the issues as they have played out in these and other disciplines. Issues to be discussed – The relationship between field and laboratory research – The evaluation of different conceptualizations of the development of cognitive capacities that underlie the claims made in research, as well as the larger meta-theories of development and evolution that frame these debates – Review of the relationship between lab and field work in the study of “imprinting” and the lessons for current primate communicative development research – The validity of methods used in comparative research, including issues of within species variability and systematic differences in methods used between species – Ways to end or go beyond the debates, including taking into account within species variability, moving beyond non-developmental cognitivist frameworks, grounding laboratory work in the evolutionary, developmental, and ecological contexts provided by ethological work, and clarifying the importance of rearing history on communicative and joint attentional skills

David Leavens

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Environmental effects on gesture formation in apes and humans

Until recently, among humans and great apes (Hominidae) certain manual gestures have been characterized as species-specific. Comparative and cross-cultural research has revealed large between-group, but within-species variation in gesture topology and incidence. This suggests that group differences in gestural signalling constitute cultural differences among both humans and their nearest living relatives. I will review some of these findings, highlighting the role of innovation in both human and nonhuman signalling in different environments, with a particular emphasis on chimpanzees. Because gestural repertoires vary across groups and within species, therefore as yet poorly specified environmental determinants influence the signalling repertoires of both humans and our nearest living relatives, the great apes. This ontogenetic flexibility is not limited to manual gestures, and I will summarize emerging evidence to the effect that some chimpanzee calls and facial expressions are also better characterized as ontogenetic, rather than phylogenetic adaptations.

Simone Pika
University of Manchester, UK

Human-ape differences in gestural performance: Unshakeable truth or due to inherent biases in methodology?

Qualitative comparisons between gestural usage of pre-linguistic human children and captive subadult apes showed that similarly to human children, apes (i) use their gestures as intentional strategies to influence the behaviour of others; (ii) utilize their gestures in dyadic and triadic interactions (imperative use), and, (iii) acquire the majority of gestures via individual learning, although social learning may play a role in the acquisition of some gestures (Pika 2008, Pika et al. 2005). However, there is also evidence of important differences and limitations. For example, in their natural communication with conspecifics, apes mainly use their gestures for making requests and regulating the behaviour of others in relation to their own goals (Pika 2008, Pika et al. 2005), while all examples of declarative gesturing are either anecdotes (Vea and Sabater-Pi 1998) or from human-raised or language-trained apes (Gardner and Gardner 1969, Patterson 1978, Savage-Rumbaugh et al. 1986). It therefore has been argued that these abilities are unique to human beings and are linked with the cognitive ability that enables humans to understand other persons as intentional agents with whom they may share experience (Povinelli and Eddy 1996, Tomasello et al. 2005).

The validity of methods used in comparative studies of apes and humans has however been questioned recently, focusing on two major reasons: First, within species variability has not been taken into account, and second, methodological designs have differed systematically between species (Boesch 2007). Although, it is not always possible and mostly also not desirable to use identical methods across species (e.g. children are motivated in experiments to pursue small toys, while chimpanzees are not, Tomasello and Call 2008), differences in gesture performance might simply reflect within species variability rather than a human-ape difference (Boesch 2007).

In order to go beyond this intriguing debate, the present paper will present a systematic review of the state of the art. I will then argue that cross-species comparisons are problematic due to inherent biases in the methodological approach, study groups and cultures. I propose the way forward is (1) to take into account within-species variability in gestural studies, and (2) to consider more carefully species appropriate scenarios and comparisons.

Tyler Wereha & Timothy Racine
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How complementary is the lab/field relationship? Lessons from the study of imprinting for the study of primate intersubjectivity

Despite a recognition that both laboratory and field research are important and complementary in science, there still seems to be much tension between researchers who identify with one camp more than the other. This debate shows no sign of ending in regards to the current study of primate joint attention (Boesch, 2007; 2008; de Waal et al., 2008; Herrmann et al., 2007; Tomasello & Call, 2007). We argue that researchers have different conceptions of what this complementarity involves. Although many laboratory researchers see most comparative joint attention research as providing much needed elucidation of the cognitive capacities of human and non-human primates, we argue that these experiments are not grounded in the evolutionary, developmental, and ecological context (abbreviated “developmental” context) that is provided by ethology.

We argue that current experimental work is not grounded in the developmental context provided by ethology, and such ungrounded, uncontextualized experimental work is potentially misleading and difficult to interpret. We study cognitive capacity through what an organism does, and what an organism does, can do or cannot do must be understood in terms of its developmental life history. For example, failure to ground cognitive capacity in life history leads to a problematic claims regarding differences between primate species, especially in terms of the role and effect of rearing histories (Boesch, 2007; Leavens & Racine, 2009; Racine, Leavens, & Wereha, in press). It is only by grounding laboratory exploration of joint attention in the “developmental” context provided by ethology that these experiments will become truly “complementary”. And only then can we consider the extent to which construct such as shared intentionality (Tomasello & Carpenter, 2007) can play a role in accounting for the development of such skills.

The disconnect between the field and the lab played out before in the rise and fall of the study of imprinting (see Bateson, 1966; Shapiro, 1980; Sluckin 1973 for reviews). The study of imprinting is an example of a research programme that was inspired by ethology, but failed to ground laboratory work in the appropriate life history context provided by ethology (see Wereha & Shapiro, 2009). Imprinting essentially became a phenomenon confined to the laboratory, and when it was realized that it had little generalizability to the duckling in the natural environment, the imprinting research programme died. Such a fate may also await comparative research into communicative development and “shared intentionality” in joint attentional development.

Lorenza Mondada (Coordinator)
Albert-Ludwigs-Universität Freiburg, Germany

Panel presentation

This panel explores some issues related to the multimodal organization of plurilingual interactions. Adopting a Conversation Analytic perspective on social interaction, and considering the interactional order as being achieved in a timed, emergent, coordinated and situated way by the participants mobilizing a multiplicity of linguistic, gestural, and bodily resources, the papers focus on the specificity of gesture in plurilingual settings. The panel focuses on situations in which participants speak different languages at the same time (code switching, mixed languages, bilingual talk, lingua franca, nonnative talk, etc.), and do not share the same competences in the various languages and cultures being adopted. It questions the role of gesture in these settings. More precisely, one paper deals with the specific role of gesture in turn taking in difficult conversational moments, where some participants experience difficulties to establish or to maintain speakership; another paper deals with the use of gesture in the organization of spontaneous translation sequences, where one participant helps another one to express herself; a third paper deals with the specific mobilization of gesture in the emergence of disalignment, disagreement and misunderstanding sequences. In all the cases, the paper questions the way in which multimodality establishes a particular accountability of action in multilingual and multicultural settings. All the papers are based on multimodal Conversation Analysis and on video recorded data carefully transcribed, including the annotation of gesture, gaze and body positions.

Vassiliki Markaki
University of Lyon, France

Gesture in plurilingual disagreeing talk

This paper focuses on disalignments and disagreements in plurilingual interactions and on the role gesture resources play for making the trajectory of action accountable. Based on a corpus of video-recorded data of international professional meetings collected within the framework of the DYLAN European Project (6th PCRD), the paper is interested in the way in which participants deal with emerging disalignment in settings where they don't share the same linguistic and cultural resources. Disalignment can be treated in these situations as accountably related to misunderstandings and to communicative problems or it can be interpreted as generated by an emergent disagreement. In such plurilingual settings, the accountability and the categorization of the emerging trajectory of action can be variable, uncertain and ambiguous; and this study deals with the way in which gesture and embodied posture can contribute to a clearer intelligibility of what is going on.

Recent research has shown that disagreeing is an interactional accomplishment and one of the most important places for the development of disaffiliation (Goodwin, 2006). Based on Conversation Analysis (Schegloff, 2007) and Membership Categorization Analysis (Sacks, 1972), our analysis aims at exploring multimodal sequential properties of "dispreference organization" making visible and audible incipient disagreements and exhibit emerging peer relationships in terms of affiliation and disaffiliation (Drew 2006, Steensig & Drew, 2008, Stivers, 2008). In order to do this, we examine various professional plurilingual meetings, differing with respect to the number of participants, specific local activities, participation formats, level of formality vs. informality. In these settings we observe that participants exploit all of the resources locally available in order to achieve and to make intelligible their disagreement in a multimodal way. Furthermore, the paper gives examples of sequences that end up as disagreements as well as misunderstandings, and compare the plurilingual and the gestural resources used by participants to distinguish a repair of understanding from a repair as a preliminary for a disaffiliative action.

References

- Goodwin, M.H. (2006) *The hidden life of girls: Games of Stance, Status, and Exclusion*. Blackwell Publishing.
- Drew, P. (2006) Mis-alignments between caller and doctor in 'out-of-hours' telephone calls to a British GP's practice. In Heritage, J. and Maynard, D. (eds.) *Communication in Medical Care: Interaction between Primary Care*, pp. 416–44.
- Sacks, H. (1972). An initial investigation of the usability of conversational materials for doing sociology. In D. Sudnow (Ed.), *Studies in Social Interaction* (pp. 31–74). New York: Free Press.
- Schegloff, E. A. (2007). *Sequence Organization in Interaction: A Primer in Conversation Analysis* (Vol. 1). Cambridge: Cambridge University Press.
- Steensig, J., Drew, P. (2008). Questioning and affiliation/ disaffiliation in interaction. *Discourse Studies*, 10/1, 5–15.
- Stivers, T. (2008). Stance, alignment, and affiliation during storytelling: When nodding is a token of affiliation. *Research on Language and Social Interaction*, 41(1), 31–57

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Gesture and the organization of spontaneous translation

This paper analyses the role played by gestures in the activity of oral informal translation taking place within broader institutional plurilingual interactions. In this type of contexts, translation can be used by participants occasionally and spontaneously in order to handle the linguistic differences among them and, eventually, to solve specific lexical problems; participants not only negotiate its emergence as a local phenomenon (negotiation which is visible, in the first place, at the level of the turn-taking system) but also seem to construct together the translation itself, configuring it as an interactive accomplishment. In the collaborative construction and organization of translation, gestures (as well as gaze and body postures) seem to play a crucial role:

- first, they can be mobilized to initiate a translation sequence (particularly when repair sequences such as word searches emerge) and to indicate both a suspension of the main activity and the development of a side sequence (cf. Goodwin, 1983; Goodwin & Goodwin, 1986; De Fornel, 1987)

- second, they can “participate” to and constitute the translation itself, as the translator “reformulates” and “reproduces” multimodally (with both words and gestures) what has been previously said and done by the “translated” speaker.

Considering, from a Conversation Analytic perspective, the temporal and sequential character of multimodal resources, the analysis will look at these two interrelated aspects of gestures and will propose a broader conception of translation: traditionally considered as the transposition of verbal meanings from one language to another, translation will here be conceived as an embodied activity, as the re-creation and co-construction of the participants’ action.

The study is based on video-recordings of institutional and professional plurilingual interactions, collected within the framework of the DYLAN project: data are constituted of international work meetings of a big multinational company (40 hours) and institutional meetings between young people coming from different European countries (25 hours).

References

- De Fornel M. (1987) De la pertinence du geste dans les séquences de réparation et d’interruption, in B. Conein, M. De Fornel and L. Quééré (eds.) *Les formes de la conversation*, Vol. 2, Paris: CNET, pp. 119–154.
- Goodwin C. (1983) Searching for a word as an interactive activity, in J. N. Deely and M. D. Lenhart (eds.) *Semiotics*, New York: Plenum Press, pp. 129–138.
- Goodwin M. H. and C. Goodwin (1986) ‘Gesture and coparticipation in the activity of searching for a word’. *Semiotica*, 62 -1/2, pp. 51–75.
- Hayashi M. (2003) ‘Language and the Body as Resources for Collaborative Action: A Study of Word Searches in Japanese Conversation’. *Research on Language and Social Interaction*, 36(2), pp. 109–141.
- Jefferson G. (1972) Side sequences, in D. Sudnow (ed.) *Studies in social interaction*, New York: Free Press, pp. 294–338.
- Muller, F. E. (1989) ‘Translation in bilingual conversation : pragmatic aspects of Translatory interaction’. *Journal of Pragmatics*, 13, pp.713–39.
- Schegloff E. A. (1984) ‘On some gestures’ relations to talk’, in J.M. Atkinson & J.C. Heritage (eds.) *Structures of Social Action*, Cambridge: Cambridge University Press, pp. 266–298.
- Streeck J. (1993) ‘Gesture as communication I: Its coordination with gaze and speech’. *Communication Monographs*, 60, pp. 275–299.

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The multimodal organization of turn taking in plurilingual meetings

The paper focuses on gesture as a powerful resource for the visible organization of turn-taking in plurilingual settings where participants use different languages and often manifest different asymmetric linguistic competences. Gesture and gaze have been studied in the way in which they are mobilized by speakers to achieve self-selection, other-selection as well as establish various participation frameworks (Duncan & Fiske, 1972; Kendon, 1973; Goodwin, 1981, 1986; Schegloff, 1984; Streeck & Hartge, 1992, Mondada, 2007 among others); nevertheless the specific way in which these resources are exploited in plurilingual settings has been relatively ignored. This paper focuses on practices for managing turn-taking in meetings where some of the participants have difficulties in establishing themselves as speakers, where established speakers have to fight for the floor, and where the chairman’s attempts to (re)configure the participation framework transpire as problematic. In these situations, we focus on the specific role of multimodal resources, and on the peculiar articulation of plurilingual talk and gesture.

The data on which this analysis is based have been collected within the European project DYLAN, dealing with linguistic diversity at work; data are videotaped meetings held in a multinational company, during which managers coming from various national branches have to work together in small groups and in plenary sessions. In these settings, the mobilization of gesture for the management of turn-taking raises various general questions, such as the specificity of gesture within the organization of turns-at-talk in different languages, the specificity of gesture within the same activity type in different cultures, and the specific shape and role of gesture within turns presenting various hitches, self-repairs, word searches and other perturbations of the progressivity of action.

References

- Duncan, S. J., & Fiske, D. W. (1972). Some signals and rules for taking speaking turns in conversations. In S. Weitz (Ed.), *Nonverbal Communication* (pp. 298–311). New York: Oxford University Press.
- Kendon, A. (1973). Some Functions of Gaze-Direction in Social Interaction. In M. Argyle (Ed.), *Social Encounters: Readings in Social Interaction* (pp. 22–47). Chicago: Aldine (reprinted from *Acta Psychologica*, vol. 26, 1967, pp. 22–47).
- Streeck, J., & Hartge, U. (1992). Previews: gestures at the transition place. In P. Auer & A. di Luzio (Eds.), *The Contextualization of Language* (pp. 135–157). Amsterdam: Benjamins.
- Schegloff, E. A. (1984). On Some Gestures’ Relation to Talk. In J. M. Atkinson & J. Heritage (Eds.), *Structures of Social Action* (pp. 266–296). Cambridge: Cambridge University Press.
- Goodwin, C. (1981). *Conversational Organization: Interaction Between Speakers and Hearers*. New York: Academic Press.
- Goodwin, C. (1986). Gesture as a resource for the organization of mutual orientation. *Semiotica*, 62(1–2), 29–49.
- Mondada, L. (2007). Multimodal resources for turn-taking: Pointing and the emergence of possible next speakers. *Discourse Studies*, 9(2), 195–226.

Christiane Moro¹ & Mats Andréⁿ (COORDINATORS)

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Panel presentation

In this panel, we will consider gestures that involve objects, which is a comparatively rare topic within gesture studies, regarding how frequent they are. In the three studies presented, we will examine how gestures and objects are conceptualized, in communication as well as thought, and we will also discuss the related epistemological frameworks. More specific issues that will be treated are:

1) the status of deictic gestures vs. content-loaded gestures; 2) the question of the meaning of gestures related to objects; 3) how to describe communicative acts that involve objects, since they are both similar and different to empty-handed gestures; 4) the status of gesture in respect to sign, action and body.

Mats Andréⁿ

Lund University, Sweden

Doing and speaking

The aim of this analysis is to provide a structured way of describing communicative acts that involve handling of objects. These types of communicative acts can be hard to describe systematically as they are often fused with the logic of practical action, and not always made exclusively for communicative purposes. Still, such action is frequent in many contexts and often coordinated with speech, temporally and semantically, much like prototypical empty-handed gestures (cf. Andréⁿ, in press).

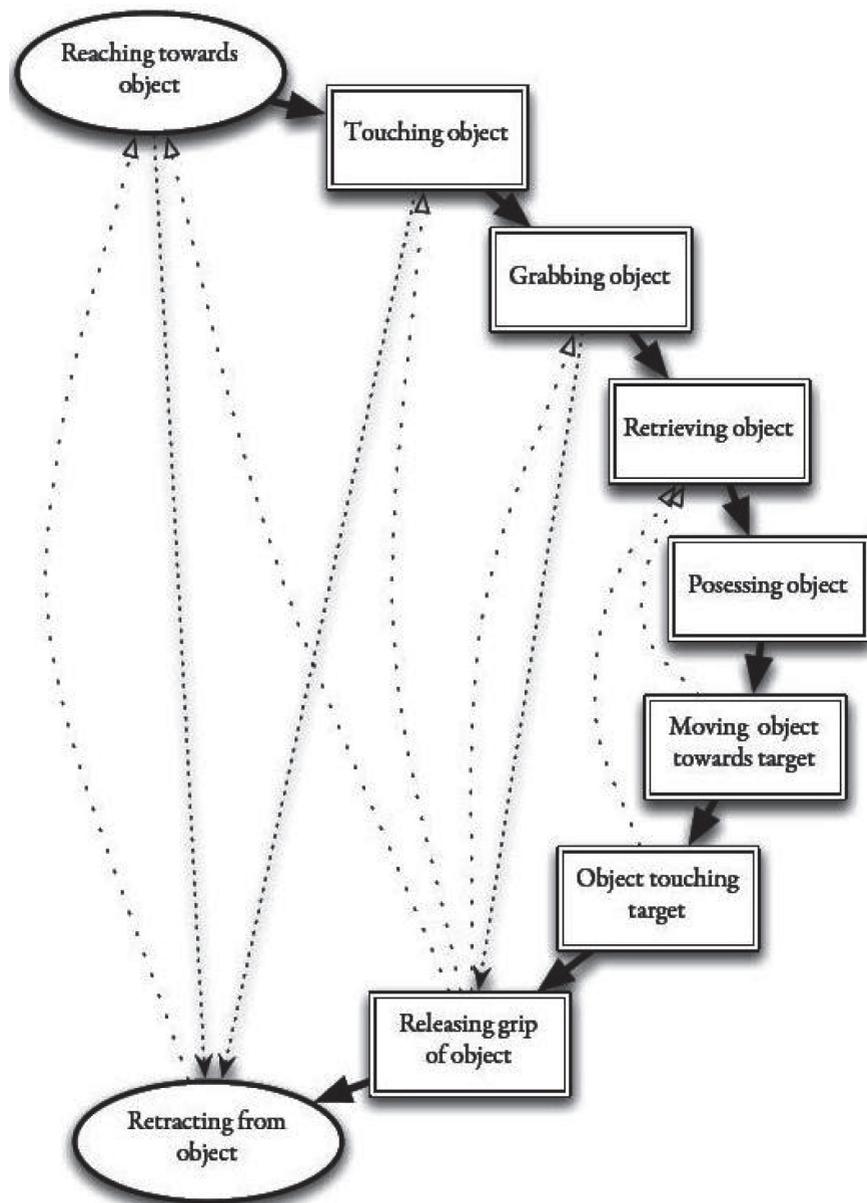
The analysis (systematic micro-analysis, which will also be exemplified by a number of clips) has been concerned mostly with the description of communicative acts performed by children between 18-30 months. Whereas most previous research on child gesture has addressed this issue by employing a set of categories such as POINT, GIVE, SHOW, and/or by distinguishing overarching types such as “representational” and “deictic” gesture, the approach presented here instead focuses on the unifying fact that all of these acts are variants of manual “excursions” in some way or another. At any given moment, the communicative potential of the hands is not arbitrary, but subject to a more or less structured set of possibilities. Different communicative acts take on different meanings by traversing different paths through this set of possibilities and by highlighting different moments in these excursions, giving rise to different overall action gestalts. As the excursions unfold they may exploit things like movement dynamics (such as holds and “strokes”, cf. Kendon 1980) and orchestration with other resources (such as speech and gaze) in a limited number of ways. “Limited” should be taken with a grain of salt, of course, since the set of possibilities is not strictly speaking finite. However, many of the appearing patterns are highly recurrent, and this allows for an analytic vocabulary of manageable size for many analytic purposes.

In joint activity, many “action gestalts” that would not normally be called “gesture” enter the “main attentive track” (cf. Kendon 1978). Consider, for example, the rather clear contrast between “merely putting something away”, and “putting something at a particular place” (perhaps while saying “there!”). All points in the excursions (see figure) are of potential communicative relevance. They may appear relatively generic and indicative (similar to “deictic” gestures) or in more particular content-loaded ways, resting on some particular form of socially typified knowledge (similar to “iconic” gestures). Due to conditions inherent in handling objects there tends to be certain phases, such as an initial phase of orienting towards an object (*reach, touch, grab*), then “possession” (objects being *used, inspected* or *shown*), and then moving towards (*pointing with object, or offer/give*), putting the object down, and finally *retraction*.

This study goes some steps towards a better understanding of what it is that makes children’s communicative acts recognizable for what they are. Instead of treating the various ambiguities as a “methodological problem” to be steered away from, through inter-rater measures or even by defining it away, I suggest that these things are worthy of systematic investigation in their own right.

References

- Andréⁿ, M. (in press). Gesture and object manipulation. In: C. Sinha, C. Rodríguez, & J. Vang (eds.), *A Companion to Cognitive Semiotics 1: Meaning and materiality*. Peter Lang.
- Kendon, A. (1978). Differential perception and attentional frame in face-to-face interaction: Two problems for investigation. *Semiotica*, 24(3–4), 305–315.
- Kendon, A. (1980). Gesticulation and speech: Two aspects of the process of utterance. In: M. R. Key (ed.), *The Relationship between Verbal and Nonverbal Communication*, 207–227. The Hague: Mouton.



Nevena Dimitrova

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Object exploration: What gestures can tell us about the construction of meaning?

Infants' early exploratory gestures of objects have mainly been studied as cognitive mechanisms allowing perceptual and motor integration (Thelen & Fogel, 1989). The understanding that the infant develops about the enviring objects and their meaning is largely considered in the literature as the perception of object's affordance (Gibson, 1979).

Following Vygotsky's cultural-historical approach of psychic development (1934/1985), we consider infants' understanding of objects as a result of a transmission-appropriation process through signs (Moro & Rodríguez, 2005). In situations of triadic (adult-infant-object) interactions, adults make gestures (signs) concerning object's use that reveal the meaning of the object (by meaning we intend the socially determined, conventional use of the object). Infants start to use objects conventionally and meanwhile they begin to appropriate gestures that adults initially produced to transmit the object use to the infant.

In this talk, I will argue that if we consider seriously the object and its cultural specificity, we can bring new light to the analysis of infant's exploratory gestures in terms of meaning construction.

The (micro)analysis that I propose is a case study of a 10 months-old infant interacting with his mother and an object. I will demonstrate in a video example that when a child is aware of the conventional use of an object but is unable to perform it, he is exploring the object thus producing a specific gesture called ostension.

I will argue that this type of semiotic analysis goes beyond perception-action integration accounts of infant's exploratory activities and offers a new perspective of how infants get to understand the material world.

References

- Gibson, J.J. (1979). The theory of affordances. In *An Ecological Approach to Visual Perception* (pp. 127–143). Boston: Houghton Mifflin.
- Moro, Ch., & Rodríguez, C. (2005). *L'objet et la construction de son usage chez le bébé. Une approche sémiotique du développement préverbal*. Berne : Peter Lang.
- Thelen, E., & Fogel, A. (1989). Toward an action-based theory of infant development. In J. Lockman & N. Hazen (Eds.), *Action in social context : Perspectives on early development*. Perspectives in developmental psychology, (pp. 23–63). New York: Plenum.
- Vygotsky, L.S. (1934/1985). *Pensée et langage*. Paris: Editions Sociales.

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Pragmatics of the object and the approach of prelinguistic non verbal communication

I will first briefly introduce the issue of Pragmatics of the object (Moro & Rodríguez, 2005). This approach concerning the development of knowledge and thought in the preverbal period is inspired by Vygotsky's semiotic framework related to the development of thought and language (Vygotski, 1934/1997). In our work on preverbal development, we notice that when children appropriate the canonical uses of the objects, they become able to produce intentional gestures related to these uses either towards other people or towards oneself. Our findings cross what is mentioned in literature (Bates, 1976 quoted in Volterra et al., 2004) which reports that intentional communication towards other people appears between 9 and 13 months. In our work, we show that intentional communication is linked to public meaning related to the objects. On the basis of our findings, we will rediscuss 1) the status of communicative gestures in relation to the appropriation of the use of the object; 2) the question of deictic versus content-loaded gestures; the relation between gesture and sign. On a methodological point of view, we will argue for the necessity of a semiotical analysis of gestures in the context of their emergence, i.e. in adult-object-baby triadic interactions.

References

- Bates, E. (1976). *Language and Context. The Acquisition of Pragmatics*. New York : Academic Press.
- Moro, C. & Rodríguez, C. (2005). *L'objet et la construction de son usage chez le bébé. Une approche sémiotique du développement préverbal*. Berne : Peter Lang.
- Vygotski, L.S. (1934/1997). *Pensée et langage*. Paris : La Dispute.
- Volterra, V., Caselli, M.C., Capirci, O. & Pizzuto, E. (2004). Gesture and the Emergence and Development of Language. In M. Tomasello & D.I. Slobin (Eds.), *Beyond Nature Nurture. Essays in Honor of Elizabeth Bates* (pp. 3–40). Mahwah, New Jersey, London: Lawrence Erlbaum Associates.

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Panel presentation

The panel presents an interdisciplinary perspective on the analysis of co-verbal gestures. ToGoG pursues a linguistic, cognitive, and semiotic perspective on gestures and aims at providing an encompassing account of the fundamental structural properties of co-verbal gestures. It takes a strictly form-based approach on all levels of analysis and theory. This means that it accounts for gestures as motivated signs, spells out the cognitive semiotic properties of gesture formation, offers insights into principles of meaning formation of spontaneous as well as of recurrent co-speech gestures. Moreover it investigates principles and forms of gesture combinations and identifies interfaces of gesture-speech integration. In short the linguistic core of ToGoG offers the foundations of a grammar of gesture and of a multimodal grammar – integrating gesture into the linguistic system.

Selected aspects of forms furthermore are researched with regard to their neuropsychological foundations and evolutionary precursors. The panel presents an overview of the linguistic ToGoG approach and its interdisciplinary interfaces.

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Recurrent gestures: Families of manual actions as bases of gesture families

So far, analyses of performative (Müller 1998) or pragmatic (Kendon 2004) gestures have revealed that they may form networks of “gesture families” (Kendon 2004, Müller 2004, Ladewig subm.), i.e. “groupings of gestural expressions that have in common one or more kinesic or formational characteristics”. (Kendon 2004: 227) Gesture families constitute a specific group of gestures, which ToGoG has termed “recurrent gestures” (Bressemer & Ladewig in prep.) and Ladewig (subm.) defines as gestures with a recurrent form-meaning pairing: “This gesture can be termed recurrent, since it is used repeatedly in different contexts and its formational and semantic core remains stable across different contexts and speakers.” This talk takes a somewhat different approach in applying an onomasiological perspective on recurrent gestures and we spell out the process of derivation from a specific mimetic base (everyday action) to gestural meaning (Müller 2004, Teßendorf 2005, Streeck 2009). Our analysis is based on a corpus of 25 hours of various discourse types produced by 73 speakers in which we have identified 219 examples across a range of 17 different recurrent gestures. In particular, we have examined a gesture family which is strictly based on a specific kind of everyday action, namely an action which serves to remove objects from the body or keep them away from it. In our talk we focus on a group of 5 recurrent gestures which all express “denial” or some kind of “negation” by sweeping, flipping, throwing, brushing, and holding away with the hand. These 5 gestures have been analyzed following ToGoG’s linguistic Methods of Gesture Analysis (Bressemer & Ladewig in prep., Ladewig subm., Mittelberg to appear, Müller 1998, 2004, 2007, Müller et al. in prep.). Following this analytical procedure we discovered that all of the 5 recurrent gestures share an underlying effect of action, leading to shared features but also to differences in the 5 recurrent gestures: All gestures share the effect of moving or keeping things away from the body on the basis of the bodily level of action and this process of getting rid of objects is exploited to form gestures of denial and negation. However, each gesture is different in that it removes or repels particular objects ranging in size from large to small as well as displaying different qualities. The differences in the mimed actions correlate specifically with subtle meaning distinctions in the 5 recurrent gestures. We will therefore argue that similarities in meaning within this group of gestures are motivated by a similar effect of the action base and that oppositions between the gestures are based on differences in everyday actions. We will conclude that these actions provide the basis for shared as well as for distinct characteristics and thus explain form and meaning variation within this group of gestures. Using these results, the concept of gesture family is expanded in that the shared semantic theme or core is found to be on the level of everyday actions that serve as the mimetic base of the 5 recurrent gestures presented.

References

- Bressemer, J. & Ladewig, S. (Eds.). (in prep.). Hand made patterns. Recurrent forms and functions in gestures. Amsterdam: Benjamins.
- Kendon, A. (2004). *Gesture. Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Ladewig, S. (subm.). Putting a recurrent gesture on a cognitive basis.
- Müller, C. (1998). *Redebegleitende Gesten: Kulturgeschichte – Theorie – Sprachvergleich*. Berlin: Arno Spitz.
- Müller, C. (2004) Forms and uses of the Palm Up Open Hand: A case of gesture family? In C. Müller & R. Posner (ed.) *The semantics and pragmatics of everyday gestures. Proceedings of the Berlin conference, April 1998*, Berlin: Weidler, 233–356.
- Müller, C. (2007). Methods of Gesture Analysis. Ms.
- Müller, C., Fricke, E., Ladewig, S., Mittelberg, I., & Teßendorf, S. (in prep.). Gestural Modes of Representation –revisited.

Streeck, J. (2009). *Gesturecraft. The manu-facture of meaning*. Amsterdam: Benjamins.
 Teßendorf, S. (2005). Pragmatische Funktionen spanischer Gesten am Beispiel des "Gesto de Barrer". Unpublished Master Thesis, Freie Universität Berlin.

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Attribution and multimodal grammar: How gestures are syntactically integrated into spoken language

Can gestures take over grammatical functions in spoken language? Are there points of structural integration into vocal syntax? The first goal of my presentation is to give proof that co-speech gestures can be structurally integrated as constituents of nominal phrases in German spoken language. The second goal is to show that these syntactically integrated gestures can function as attributes to the verbal nucleus of nominal phrases.

The assumption that co-speech gestures are integrated on the level of language use is widely accepted (e.g. Kendon 2004, McNeill 2002 and 2005, Müller 2008). For example, co-speech gestures are co-ordinated with the intonation as well as semantically and pragmatically co-expressive with the verbal utterance. But what about multimodal integration on the level of the language system? The idea that a certain syntactic function can be instantiated by entities of different modalities, e.g. visual or auditory, is not new and can be traced back to linguists and semioticians such as Karl Bühler, Louis Hjelmslev, and Kenneth Pike. Nevertheless, most descriptive studies in linguistics so far are based on vocal speech and its auditory channel alone. What is the syntactic relationship between speech and co-speech gestures in multimodal grammar? This question seems to be a blind spot in the field of gesture studies too.

My claim is that co-speech gestures are able to instantiate the syntactic function of an attribute within verbal nominal phrases. On the one hand, they can be syntactically integrated by verbal deictics, for instance, 'son' or 'so ein' in German [engl. paraphrase: 'such a' or 'like this'] as evidenced in the following example, which obligatorily requires a qualitative description on the level of the language system (Fricke 2007, 2008). This description of a quality can be instantiated verbally or gesturally: 'sone gelb-goldenen Tafeln' ['such yellow golden plates'] (+ rectangular gesture). In this example we can observe a division of labour: The verbal adjective provides a description of a colour, whereas the co-verbal gesture gives a description of a shape. On the other hand, gestures are semantically integrated: Co-speech gestures can semantically modify the nucleus of the nominal phrase and are for that reason not only covered by syntactic but also by semantic definitions of attribution (Fricke 2008). Another finding is that gestural attributes can either be object-related to the reference object intended by the speaker or interpretant-related to the speaker's mental 'meaning-like' prototype which is a typical image of an entity in stable association with a verbal word form (Fricke 2008).

References

- Fricke, Ellen (2007): *Origo, Geste und Raum: Lokaldeixis im Deutschen*. Berlin, New York: de Gruyter.
 Fricke, Ellen (2008): Grundlagen einer multimodalen Grammatik des Deutschen: Syntaktische Strukturen und Funktionen. Habilitation, European University Viadrina Frankfurt/Oder. (publication by de Gruyter in 2010).
 Kendon, Adam (2004): *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
 McNeill, David (1992): *Hand and Mind: What Gestures Reveal about Thought*. Chicago: Chicago University Press.
 McNeill, David (2005): *Gesture and Thought*. Chicago: The University of Chicago Press.
 Müller, Cornelia (2008): *Metaphors. Dead and Alive, Sleeping and Waking. A Cognitive Approach to Metaphors in Language Use*. Chicago, University of Chicago Press.

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Gesture semantics: Forms, meanings and conceptualizations of spontaneous gestures

It is widely accepted that co-speech gestures may either refer to concrete or abstract entities or events and that they may serve as evidence for cognitive processes involved at the moment of speaking and gesturing (Cienki & Müller 2008a, b; McNeill 1992, 2000, 2005; McNeill & Duncan 2000; Müller 2007, 2008). In this talk, we will be proposing that a linguistic, form-based analysis reveals fine-grained differences in meaning and conceptualization which otherwise might remain unnoticed.

We will present results from an empirical interdisciplinary study of 36 German subjects in which we compared gestures referring to concrete versus abstract entities or events. Initially we hypothesized that gestures referring to the concrete would differ from gestures referring to abstract entities with regard to their form. In cooperation with ToGoG's Neurology group we developed a stimulus set of 40 stories each including a target item or phrase. In all, there were 20 target words, each of which has both a concrete and an abstract sense, e.g. eine runde Bank vs. eine runde Geschichte (a round bench vs. a complete story, lit.: a round story). In the first condition, the subjects retold the stories in two different settings: 1) they talked to a recipient, and 2) they talked to the camera. In the second condition subjects were asked to listen to the stories, repeat the target sentences, and perform a gesture.

In the first condition the subjects only rarely accompanied the target items with gestures. However, the second condition yielded interesting results: rather than differing with regard to the abstractness or concreteness of the sense conveyed, subjects appeared to differ with regard to degrees of semantic loading of the body-parts involved in gesturing, i.e. we found that in both contexts (abstract and concrete) subjects either produced a close pantomimic re-enactment of the scene depicted in the story or they used a hands-only depiction, a kind of prototypical more de-contextualized depiction of the target event.

We propose to interpret these findings following Fricke's (2007) Peircian distinction of object-based versus interpretant-based gestures. We conclude that only by taking a form-based approach, i.e. by closely describing the articulatory body-parts involved in a gestural performance and by closely accounting for their contribution to the overall meaning of the gesture, may these differences become readily visible. ToGoG's form-based approach may be used as a microscope to revealing such subtle variations in the meaning and conceptualization of gestures.

References

- Cienki, A. & C. Müller (eds.). (2008a). *Metaphor and Gesture*. Amsterdam: Benjamins.
Cienki, A. & C. Müller (2008b) Metaphor, gesture and thought. In R. W. Gibbs (ed.) *Cambridge Handbook of Metaphor and Thought*, Cambridge: CUP, 483–501.
Fricke, E. (2007). *Origo, Geste und Raum: Lokaldeixis im Deutschen*. Berlin: De Gruyter.
McNeill, D. (1992). *Hand and mind. What gestures reveal about thought*. Chicago: UoCPress.
McNeill, D. (2005). *Gesture and Thought*. UoCPress.
McNeill, D. & S. Duncan (2000). Growth points in thinking-for speaking. In D. McNeill (ed.) *Language and Gesture*, Cambridge: Cambridge University Press, 141–161.
Müller, C. (1998). *Redebegleitende Gesten: Kulturgeschichte – Theorie – Sprachvergleich*. Berlin: Spitz.
Müller, C. (2007). A dynamic view on metaphor, gesture and thought. In S. Duncan, J. Cassell & E. Levy (eds.) *Gesture and the dynamic dimension of language. Essays in honor of David McNeill*. Benjamins: Amsterdam, 109–116.
Müller, C. (2008). *Metaphors. Dead and alive, sleeping and waking. A dynamic view*. Chicago: UoCPress.

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From tool use to gesture – Differential cortical mechanisms underlying gestural demonstrations with tool in hand, tool use pantomimes, and body-part-as-object use

Introduction: Neuropsychological studies on patients with callosal disconnection and unihemispheric brain damage as well as kinematic studies demonstrate dissociations between demonstrations of tool use with tool in hand (hereafter tool demo) and tool use pantomimes with an imaginary tool in hand (hereafter pantomimes). In contrast to tool demo, the accomplishment of pantomimes requires the abilities to link the mental representation of the tool to the movement concept for tool use. Yet a different gesture type is body-part-as-object representation (hereafter BPO), in which the hand represents the tool. Thus, BPOs share with pantomimes the lack of a tactile tool stimulus, but they do not require acting with a mental image of the tool. Despite the obvious dissociations between these three gesture types, neuroimaging studies concerning the neural basis of tool use are often based on examinations of pantomimes. In the present study, we examine the neural correlates of tool demo, pantomime, and BPO.

Methods: Exp 1: 15 right-handed male volunteers were scanned (Siemens Sonata, 1.5T) while performing tool use demonstration either with tool in hand (tool demo) or without tool in hand (pantomime). Four conditions were applied in a randomized block design: (i) tool demo right hand, (ii) tool demo left hand, (iii) pantomime right hand, and (iv) pantomime left hand (20 tools per condition). Data were analyzed using FSL. Four regressors of interest (one for each experimental condition), plus one additional regressor for the instruction period were modeled. First, effects of pantomime vs. tool demo and vice versa were calculated. Second, to investigate which cerebral mechanisms underlie the two conditions, irrespective of the hand in use, we computed two conjunction analyses: Images of condition (i) vs. (iii) as well as (ii) vs. (iv) were combined by a logical AND operation, resulting in those brain regions, which are more activated by pantomime (either hand) vs. tool demo (either hand). Respectively, condition (iii) & (iv) were combined, resulting in those brain regions, which are more activated by tool demo (either hand) vs. pantomime (either hand) and v.v..

Exp 2: 12 right-handed male volunteers were scanned while performing tool demo, pantomime, and BPO. We employed a blocked design (block length 104 s) with the within-subject factors Movement Type (tool demo, pantomime, BPO), Execution type (execute vs. hold) and Hand choice (left vs. right). The following three conjunction analyses were used to identify brain areas specifically activated by the execution of the three movement types: 1. Tool Demo: (TD lh execute > TD lh hold) AND (TD rh execute > TD rh hold); 2. Pantomime: (PAN lh execute > PAN lh hold) AND (PAN rh execute > PAN rh hold); 3. BPO: (BPO lh execute > BPO lh hold) AND (BPO rh execute > BPO rh hold).

Results: Exp 1: The comparison of pantomime vs. tool demo for each hand separately resulted in mainly left hemispheric activation patterns (right hand > left hand). The conjunction analysis of (i) pantomime rh vs. tool demo rh AND (ii) pantomime lh vs. tool demo lh revealed an activation in the left superior/middle temporal gyrus. That is, this brain region was activated for either hand when pantomime was compared to tool demo. The comparison of tool demo vs. pantomime for each hand separately resulted in large bihemispheric activation patterns. The conjunction analysis of (iii) tool demo rh vs. pantomime rh AND (iv) tool demo lh vs. pantomime lh revealed a similar large network of bihemispheric activations in the pre- and postcentral gyri, the middle and superior frontal gyri, the insula, the cingulate gyrus, the

superior, middle and inferior occipital gyri, and the fusiform gyri. That is, these bihemispheric areas were activated for either hand, when tool demo was compared to pantomime.

Exp 2: (preliminary) In the left hemisphere, we observed that all three movement types elicited activation in motor and somatosensory areas as well as the cerebellum. In contrast, in the right hemisphere, only tool demo and BPO elicited activation in the right precentral/middle frontal gyrus (MNI coordinates: BPO: middle frontal; Tool Demo: precentral. No activations in the right hemisphere were observed for pantomime.

Conclusions: Our results suggest that pantomime, demonstration of tool use with tool in hand, and body-part-as-object representation partially differ in their cerebral representation. Pantomime relative to tool demo is accompanied by a left hemispheric activation in the superior/middle temporal gyrus. Thus, pantomime is not just tool demo without tool, but it requires an additional cognitive operation. In order to further examine the neural correlates of this cognitive operation, pantomime was compared with BPO. The execution of the latter gesture does not require integrating a mental tool image into the movement concept. Pantomime and BPO differed concerning the left hemispheric activation, while BPO and tool demo shared right hemispheric loci of activation. To summarize, we provide evidence for a pantomime-specific left hemispheric activation. Specifically, we suggest that this activation is the neural correlate of linking the mental representation of a tool with a movement concept.

References

- De Renzi, E. (1982), 'Modality-specific and supramodal mechanisms of apraxia', *Brain*, vol. 105, pp. 301–12.
- Eickhoff, S. (2007), 'Assignment of functional activations to probabilistic cytoarchitectonic areas Revisited', *NeuroImage*, vol. 36, no. 3, pp. 511–521.
- Haaland, K. (1984), 'The different types of limb apraxia errors made by patients with left vs. right hemisphere damage', *Brain and Cognition*, vol. 3, pp. 170–84.
- Hermsdörfer, J. (2006), 'Spatial and kinematic features of apraxic movement depend on the mode of execution', *Neuropsychologia*, vol. 44, no. 10, pp. 1642–52.
- Hermsdörfer, J. (2007), 'Neural representations of pantomimed an actual tool use: Evidence from an event-related fMRI study', *NeuroImage*, vol. 36, pp. 109–18.
- Johnson-Frey, S. (2005), 'A distributed left hemisphere network active during planning of everyday tool use skills', *Cerebral Cortex*, vol. 15, no. 6, pp. 681–95.
- Lausberg, H. (2003), 'Pantomime to visual presentation of objects: left hand dyspraxia in patients with complete callosotomy', *Brain*, vol. 126, pp. 343–60.
- Ward, B. (2000), 'AlphaSim—Simultaneous Inference for FMRI Data', Biophysics Research Institute, Medical College of Wisconsin.

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Recurrent forms and contexts: Families of gestures in non-human primates

So far gestures used by non-human primates have mainly been investigated by considering their function (for an overview of ape gestural communication see Call & Tomasello 2007; Liebal, Müller & Pika 2007). Only few investigations approach gestures of non-human primates with the aim of describing and classifying gestures based on characteristics of their form (Liebal, Pika & Tomasello 2006).

This talk presents a new approach to the study of ape gestural communication by focusing on the structural properties rather than the meaning of gestures performed by our closest relatives (Müller 2007a). By using a linguistic form-based approach developed to describe gestures in human primates (Methods of Gesture Analysis, MGA, Müller 2007b), this talk shows a) that differences in form features of the gestures described correlate with changes in the context-of-use (Kendon, 2004), b) that ape gestures can be grouped into 'gesture families', i.e. "groupings of gestural expressions that have in common one or more kinesic or formational characteristics" (Kendon 2004: 227), and c) that these are based on instrumental actions sharing similar effects.

The analysis is based on a corpus of 76 tactile and 37 visual gestures used by orangutans at the zoos in Leipzig and Zürich (Liebal, Pika & Tomasello 2006). The ape gestures have been analyzed according to their form features, i.e. hand configuration, orientation of the hand, movement and position in the gesture space (Bressemer MS.), their contexts-of-use (Kendon 2004), their combination with other articulators, and their sequential ordering.

Using this analytical procedure, it was found that gestures belonging to a particular type, such as slap, push or extend arm (Liebal, Pika & Tomasello 2006) showed particular form variations in hand shapes, orientations of the palm and movement patterns. Moreover, these variations in form correlate with changes in the context-of-use, such that gestures differed in their execution depending on whether they are used in negative (e.g. agonistic) or positive (e.g. play) contexts. These internal variations found in ape gestures can therefore be conceived of examples of 'gesture families' that have so far only been identified in the gestures of human primates.

All of the tactile and visual gestures investigated are based on instrumental actions (slapping, pushing or offering) and are therefore based on the 'acting mode' (Müller 1998; Müller et al. in prep.). Moreover, while all instances of tactile gestures seem to share the underlying effect of action intended 'to keep the counterpart away from one's own body', the effect of action found in visual gestures seems to work the other way around, i.e. the intention is 'to allow the counterpart to move closer to one's own body'.

The analysis presented in this talk not only provides insights into the structure of ape gestures, but it also suggests essential similarities in gesture formation between human and non-human primates regarding both structures of form and meaning as well as the motivation of gestures from instrumental actions.

References

- Call, J. & M. Tomasello (eds.) (2007). *The gestural communication of apes and monkeys*. Lawrence Erlbaum.
- Kendon, A. (2004). *Gesture. Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Liebal, K., S. Pika & M. Tomasello (2006). Gestural communication of orangutans (*Pongo pygmaeus*). *Gesture* 6:1, 1–38.
- Liebal K., C. Müller & S. Pika (eds.) (2007). *Gestural communication in nonhuman and human primates*. Amsterdam: Benjamins.

- Müller, C. (1998). *Redebegleitende Gesten: Kulturgeschichte – Theorie – Sprachvergleich*. Berlin: Arno Spitz.
- Müller, C. (2007a). Gestures in human and nonhuman primates: Why we need a comparative view. In: K. Liebal, C. Müller & S. Pika (eds.) *Gestural communication in nonhuman and human primates*. Benjamins: Amsterdam. 237–260.
- Müller, C. (2007b). *Methods of Gesture Analysis*. Ms.
- Müller, C.; E. Fricke; S. Ladewig, I. Mittelberg & S. TeBendorf (in prep). *Gestural Modes of Mimesis – revisited*.

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Diagrammatic iconicity as a cognitive-semiotic principle in grammar and gesture

Gestural signs and the objects they represent can be similar in various ways. Gestures imitating physical objects or actions are to a high degree image icons; gestures depicting relationships between two or more entities are diagrammatic icons; and gestures evoking parallels between two entities may rely on metaphoric iconicity (Cienki & Müller 2008; McNeill 2005; Müller 2008; Müller et al. fc.). This presentation explores how gestural representations of language and grammar may combine all three types of iconicity (Peirce 1960). Diagrammatic dimensions are particularly relevant here: they seem to belong to the cognitive-semiotic principles that may guide the interpretation of fleeting hand configurations and movements through which embodied abstract notions and structures take shape (Mittelberg 2008, fc.; Mittelberg & Waugh 2009).

The architecture of sentences and entire discourses reflects icons of relations of different degrees of complexity (Haiman 1985; Jakobson 1961; Waugh et al. 2004). Since the internal structure of gestural diagrams entails similarity as well as spatial, temporal, and cognitive contiguity, the interplay between iconic (metaphoric) and indexical (metonymic) modes is also briefly discussed.

References

- Cienki, A. and C. Müller (Eds.) (2008). *Metaphor and Gesture*. Amsterdam, Philadelphia: Benjamins.
- Haiman, J. (Ed.) (1985). *Iconicity in Syntax*. Amsterdam, Philadelphia: Benjamins.
- Jakobson, R. (1961/1987). Poetry of grammar and grammar of poetry. In K. Pomorska and S. Rudy (eds.), *Roman Jakobson, Language in Literature*. Cambridge, London: Belknap Press of Harvard University Press, 121–144.
- McNeill, D. (2005). *Gesture and Thought*. Chicago: Chicago University Press.
- Mittelberg, I. (2008). Peircean semiotics meets conceptual metaphor: Iconic modes in gestural representations of grammar. In A. Cienki and C. Müller (eds.), *Metaphor and Gesture*, Amsterdam, Philadelphia: Benjamins, 115–154.
- Mittelberg, I. (in press). Geometric and image-schematic patterns in gesture space. In V. Evans and P. Chilton (eds.), *Language, Cognition and Space: The State of the Art and New Directions*. London: Equinox.
- Mittelberg, I. & L.R. Waugh (2009). Metonymy first, metaphor second: A cognitive-semiotic approach to multimodal figures of thought in co-speech gesture. In C. J. Forceville and E. Urios-Aparisi (eds.), *Multimodal Metaphor*. Berlin, New York: Mouton de Gruyter, 322–356.
- Peirce, C.S. (1960). *Collected Papers of Charles Sanders Peirce (1931–1958)*. Vol. I.: *Principles of Philosophy*, Vol. II: *Elements of Logic*, C. Hartshorne and P. Weiss (eds.). Cambridge: The Belknap Press of Harvard University Press.
- Waugh, L.R., S.N. Smith, E. Specker, S. Steinhart and J. Wang (2004). Peircean theory, diagrammatic iconicity, and academic texts: Global structure, abstracts, and the role of narrative. *Logos and Language. Journal of General Linguistics and Language Theory V*, 1 (special issue on Aspects of Iconicity in Contemporary Linguistics), 39–62.

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Mimetic modes as bases of gestural meaning creation: Linguistic, neurological, and evolutionary aspects

In this talk we will offer an example of the interdisciplinary approach advanced in the collaborative research project “Towards a grammar of gesture: evolution, brain, and linguistic structures”. We will first present a cognitive-linguistic and semiotic analysis of the bases of gestural meaning. Gestures are inherently motivated signs, and their bases is ‘mimesis’. Drawing on Aristotle, Wundt and the discussion of iconicity in Sign Languages we will introduce the concept of mimesis as Peircian triadic sign relation (Müller 2010, Müller et al. in prep.). Based on these theoretical reflections a revision of Müller's (1998 a,b) concept of ‘Gestural Modes of Representation’ will be proposed. Instead of four modes of representation (acting, moulding, drawing, representing), we now distinguish two kinds of gestural mimesis: Acting and Representing. In acting the hands re-enact an action of the hands, in representing, the hands re-present something other than themselves, they become a sculpture of objects such as a piece of paper or a tooth brush. We furthermore suggest that acting is based primarily on tactile experience whereas representing is based primarily on visual experience. From a neurological point of view: these two mimetic modes go along with Lausberg's distinction of pantomime (Acting) and body-part-as-object (Representing). Lausberg et al. (2003) found in split brain studies, that acting gestures were based on left-hemispheric processes, whereas representing gestures were based on right-hemispheric processes. In three further studies which were carried out in the ToGoG project these findings were further supported and differentiated in that pantomime (Acting) and body-part-as-object (Representing) were compared with a tool use condition in FMRT studies and with NIS (Near-Infrared-Spectroscopy). These results are highly interesting in the light of mimesis as base of gestural meaning creation and in bringing it together with an evolutionary perspective. When comparing gestures of humans with gestures of non-humans one crucial starting point is: to what degree are non-human primates able to create gestures (Liebal et al. 2007)? And if yes – what types of gestures are these. Studies carried out in the primatological part of the ToGoG project indicate that non-human primates (orang-utans, chimpanzees) predominantly used the acting mode of mimesis when creating gestures. These findings indicate that gestural mimesis implies different neuro-cognitive, linguistic (semiotic) processes in which different hemispheres are involved and which evolve at different evolutionary stages.

References

- Lausberg, H. (2003). ‘Pantomime to visual presentation of objects: left hand dyspraxia in patients with complete callosotomy’, *Brain*, vol. 126, pp. 343–60.
- Liebal, K., C. Müller & S. Pika (eds.) (2007). *Gestural communication in nonhuman and human primates*. Amsterdam: Benjamins.
- Mittelberg, I. (2008). Peircean semiotics meets conceptual metaphor: Iconic modes in gestural representations of grammar. In A. Cienki and C. Müller (eds.), *Metaphor and Gesture*. Amsterdam, Philadelphia: Benjamins, 115–154.
- Mittelberg, I. & L.R. Waugh (2009). Metonymy first, metaphor second: A cognitive-semiotic approach to multimodal figures of thought in co-speech gesture. In C. J. Forceville and E. Urios-Aparisi (eds.), *Multimodal Metaphor*. Berlin, New York: Mouton de Gruyter, 322–356.
- Müller, C. (1998). *Redebegleitende Gesten: Kulturgeschichte – Theorie – Sprachvergleich*. Berlin: Arno Spitz.
- Müller, C. (1998a) Iconicity and Gesture. In: S. Santi et al. (eds.) *Oralité et Gestualité: Communication Multimodale, Interaction* Montréal, Paris: L'Harmattan, 321–328.
- Müller, C., E. Fricke, S. Ladewig, I. Mittelberg & S. Teßendorf (in prep). Gestural Modes of Mimesis – revisited.
- Müller, C. (2010) Mimesis und Gestik. In: G. Koch, C. Voss and M. Vöhler (eds.) *Die Mimesis und ihre Künste*. München: Fink, 149–187.

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Assessing interrater agreement of movement annotations: A work in progress

One recurring problem occurring during gesture research pertains to the assessment of interrater agreement of gesture annotations. As gestures cannot be identified by an “objective” observer but are always prone to subjective bias gesture research demands the assessment of interrater agreement in order to justify classification of bodily movements as specific gestures. Classical measures of interrater agreement like Cohen's kappa (Cohen, 1968) cannot be directly applied to gesture annotations as they rely on pre-defined objects to be classified. In contrast, during gesture research the identification and segmentation of gestures, including their beginning, their end, pauses, and transitions, constitutes an integral part of the scientific process underlying gesture research. Here we propose a novel algorithm, which allows the calculation of a modified Cohen's kappa value in order to assess interrater agreement in gesture research. The algorithm addresses segmentation and annotation synchronously and maps the data onto a 2x2 contingency table, which is subsequently analyzed using Cohen's kappa. Thereby, agreement is assessed for one gesture category at a time, which is then contrasted with the rest of all other categories. Analysis of intra-rater agreement indicated that the algorithm scores values between 0.9 – 1.0, whereas results assessing interrater agreement suggest scores typically ranging between 0.4 – 0.6 which is lower compared to scores usually associated with good rater agreement (Landis and Koch, 1977). Thus, the presented algorithms scores rather conservative and thus suggests the need for further research.

References

- Cohen, J. (1968). Weighted kappa: nominal scale agreement with provision for scaled disagreement or partial credit. *Psychological Bulletin*, 70(4), 213–220.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174.

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Decreasing movement variability with increasing skill level in a complex tool-use task

One longstanding question in human evolution concerns the relationship between tool-use and communicative gestures where the former is interpreted as a precursor of the latter (Gibson, 1993). As the earliest evidence for tool use in homo stems from stone tool artifacts, there has been an extensive debate about the implications of stone tool behavior for conceptual and intellectual capacities in early hominids. However, very little research has been done on actual tool-use and even less on actual stone tool making. In the present study sixteen participants from three different skilled groups were analyzed whilst knapping stone. Participants were either experts with more than 20 years of active knapping experience, novices with minimal experience, or intermediate skilled knappers. Participants were instructed to produce two different sized flakes. Movements of the hammer stones were recorded using an electromagnetic marker system (Polhemus Liberty) set at a recording frequency of 240Hz. Analysis of the variability of the hammer trajectory indicated decreasing movement variability across strikes for all three groups. Experts displayed the smallest movement variability across conditions. Statistical analysis indicated a significant effect for normalized time (CI: -1, -0.04). Planned comparisons indicated significant differences between large and small flake conditions for the intermediates (CI: 0.09, 0.84) and between experts and novice for the large flake condition (CI: 0.47, 3.98). The results suggest that skill in stone knapping is characterized by minimization of movement variability of the hammer end-point. Thus, with regard to evolutionary implications this might indicate that early ancestors of homo must have learned to control their movement in such a way as to minimize movement variability. With regard to gesturing this strategy seems advantageous as well as. Having acquired the ability to precisely replicate specific movements can be seen as a necessary precursor for effective gesturing in a communicative context as greater variability between gestures might hamper information dissemination.

References

Gibson, K. R. (1993). Tool use, language and social behavior in relationship to information processing capacities. In K. R. Gibson & T. Ingold (Eds.), *Tools, language and cognition in human evolution* (pp. 251–269). Cambridge: Cambridge University Press.

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Combining gestures: Mimetic and non-mimetic uses of gesture space

Studying gestures as they are used in everyday conversations reveals that, even within a single utterance, they frequently do not occur as isolated items but in combination with one another (e.g. Fricke 2008; Müller & Tag in prep.; Tag in prep.). In this talk, we focus on a specific form of co-speech gesture combination, namely one that exploits the gesture space in a particular way. By presenting examples of gesture combinations of different size and complexity that demonstrate *different types of use of gesture space* we aim to show how space as a central formal feature is used to relate gestures to one another in various meaningful ways.

For the purposes of this talk, we distinguish two different types of spatial relations between gestures: *mimetic* and *non-mimetic use of gesture space*. In a mimetic use of gesture space, a perceived or imagined scene is depicted and gestures are 'localized' ('lokalisiert', Fricke 2007: 284) to illustrate the actual 'gestalt' of a percept or concept, e.g. the structure of a baroque garden. In contrast, a non-mimetic use of gesture space exploits the gesture space to express abstract notions, such as 'intensification'. For example, two hands with a lateral palm configuration are used to depict two parallel axes of a baroque garden, and then the left hand rises while remaining in parallel with the right hand and while the right hand maintains its position and thus continues to depict one of the two parallel axes. In this example, the left-handed gesture that rises higher up does not imply that the left axis of the baroque garden has risen; rather, the higher position in the gesture space implies greater visibility that may cause the interlocutor's attention to increase. We propose that this is how an intensification of the gesture's meaning is achieved.

To conclude: We suggest that when gesture space is not being used to mime spatial scenes, it is free to be functionally charged with other notions and that this functional freedom opens up a pathway for processes of grammaticalization (Fricke 2008, in prep.).

References

Fricke, E. (2007) *Origo, Geste und Raum: Lokaldeixis im Deutschen*. Berlin, New York: de Gruyter.
 Fricke, E. (2008) *Grundlagen einer multimodalen Grammatik des Deutschen: Syntaktische Strukturen und Funktionen*. MS., Habilitation, European University Viadrina, Frankfurt/Oder.
 Fricke, E. (in prep.) *Gesture space: Dimensions, positions and values*.
 Kendon, A. (2004) *Gesture. Visible action as utterance*. Cambridge: Cambridge University Press.
 Müller, C. & S. Tag (in prep.) *Combining gestures: mimetic and non-mimetic uses of gesture space*.
 Tag, S. (in prep.) *Simultaneous constructions in co-speech gestures*. In: Bressemer, Jana & Silva H. Ladewig (eds.) *Handmade patterns: recurrence in co-verbal gestures* (planned for submission to *Semiotica*).

talks

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A grammar for language and co-verbal gesture

Meaning in everyday communication is conveyed by various signals including spoken utterances and spontaneous hand gestures. The literature has attested that gestures function in synchrony with speech to deliver an integrated message, or a 'single thought' [5],[1], exhibit language-specific properties [2] and are subject to formal semantic modeling [3].

One of the challenges in modeling synchrony is to use the form of the verbal signal, the form of the gesture and their relative timing to produce an integrated meaning representation. We meet this challenge by exploiting well-established semantic composition rules for deriving meaning from the form of the multimodal action. So, while the existing grammars (HPSG, LFG, CCG) produce semantic representations for unimodal input, we argue that any formalization of language should fit into the multimodal perspective of synchronizing language and co-verbal gesture.

The temporal performance of the gesture, its dimension(s) and ambiguous form do not uniquely determine the synchronous linguistic phrase. This raises the distinction between synchrony and simultaneity, thereby allowing for a gesture to attach to more than one constituent without causing ungrammaticality or incoherence. Nevertheless, the choices of attachment are constrained. We consider (1) ill-formed despite the semantic relation between the container shape of the hands and the books (pitch accent is shown in caps).

(1) I GAVE you the other books

Along with the other books, both hands in ASL-B shape move forward to the frontal center, palms facing one another, half foot apart. Here the gesture along with the prosodic phrase contributes contrastive effects in the hearer's model and it should combine with a phrase containing the pitch-accented item. An overall challenge is to constrain synchrony in a way that rules out ill-formedness, while producing underspecified logical forms supporting all plausible interpretations in the context-of-use.

We define well-formedness constraints in terms of prosody, syntactic constituency, headedness and timing. In the full paper, we will use a detailed study of a multimodal corpus [4] to motivate that the synchronous phrase to a gesture can be:

1. the temporally overlapping head provided it bears the pitch accent. Suppose the gesture in (1) spanned the whole utterance, this enables attaching the gesture to gave, making it depict gave.
2. a constituent larger than the head, provided the head and its immediate constituents form a 'sense unit' [6], and the prosodically prominent element overlaps gestural performance. This rule would attach a sentence-spanning gesture for (1) to the head upon partially or fully saturating it: gave you, gave you the other books, I gave you the other books.

The choice is still constrained: no rule enables you the other books or I to be synchronous: the former violates the sense unit condition and the latter the prosodic markedness.

We will further show that any formalism that interfaces syntax/semantics and prosody is well-suited for regimenting synchrony and its effects on multimodal meaning, regardless of whether the surface syntactic structure is isomorphic to prosodic structure (e.g., CCG) or not (e.g., HPSG, LFG).

References

- Kendon, A. (2004) *Gesture. Visible Action as Utterance*.
 Kita, S. and Özyürek, A. (2003) What does cross-linguistic variation in semantic coordination of speech and gesture reveal?: Evidence for an interface representation of spatial thinking and speaking. *Journal of Memory and Language*, 48.
 Lascarides, A. and Stone, M. (2009) Discourse coherence and gesture interpretation. *Gesture*, 9(2).

Loehr, D. (2004) *Gesture and Intonation*. Washington DC.

McNeill, D. (1992) *Hand and Mind. What Gestures Reveal about Thought*.

Selkirk, E. (1984) Phonology and Syntax: The Relation between Sound and Structure. *Current Studies in Linguistics*.

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On gestural responsive actions

Non-vocal practices that occur with talk in interaction have long been an important issue in Conversation Analytic (CA) research, for example Goodwin's demonstrations that recipients gaze can affect the progression of a turn at talk (Goodwin, 1979). Nevertheless, most of the key organizations that have been identified in CA research concern actions in interaction that are implemented through talk. When non-vocal practices have been examined, the focus has often been on how they supplement talk (e.g., Lerner 2002) rather than replace it.

Video data from a variety of everyday and institutional situations (e.g. household activities, school, healthcare), with participants of varying verbal and physical abilities and cultural backgrounds are examined. Most of the corpus was collected in the US or the UK and is in English (though not all participants are native English speakers). With the aid of this video data, we consider the issues in discussing gestures in terms of sequence organisation.

First, we show that non-vocal practices can bring about verbal utterances from co-conversationalists.

Second, we show that members of a class of grossly informative gestures that have widely known and specific meanings in the context of their production (e.g. nodding in response to a yes/no interrogative) may be used in implementing a responsive action with or without accompanying talk.

Thirdly, we show that responsive actions implemented non-verbally (and in particular, non-vocally) often start at the place where an action implemented through talk might start. However the endings of these actions are commonly less determinate and often overlapped by talk.

Finally, we show that gestures may be used most often when there is a possible problem with communicating vocally.

We conclude that gesture may have a turn-taking structure of its own that differs from that of talk and that this may affect the ways in which we treat gesture in sequence organisation. Nevertheless, gesture can and regularly does in certain contexts take the place of talk in a course of action.

References

- Lerner, G.H. (2002). Practice does not make perfect: Intervening actions in the selection of next speaker. Plenary address to the Conference on Language, Interaction and Culture, UCLA.
- Goodwin, C. (1979). The Interactive Construction of a Sentence in Natural Conversation. in Psathas (Ed.) *Everyday Language: Studies in Ethnomethodology* (pp 97–121). New York: Irvington.

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What shapes iconic gestures? Insights from computational modelling

The question “why different gestures take the particular physical form they do is one of the most important yet largely unaddressed questions in gesture research” (Bavelas et al., 2008). The intricacy is due to the fact that iconic gestures have no conventionalized form-meaning mapping. Apparently iconic gestures communicate through iconicity, i.e., their physical form depicts object features such as shape or spatial properties. Similarity with the referent, however, cannot account for all occurrences of iconic gesture use. Recent findings indicate that a gesture's form is also influenced by specific contextual constraints and the use of more general gestural representation techniques such as shaping or drawing. In addition, inter-subjective differences in gesturing are pertinent (Hostetter & Alibali, 2007). There is, e.g., wide variability in how much individuals gesture when they speak. Similarly, inter-subjective differences are found in preferences for particular representation techniques or low-level morphological features such as handshape or handedness.

Taken together, iconic gesture generation on the one hand generalizes across individuals to a certain degree and these commonalities may pertain primarily to gesture's iconicity. On the other hand, inter-subjective differences must also be taken into consideration by an account of why people gesture the way they actually do (Bergmann & Kopp, in press). Our research methodology to investigate this puzzle of iconic gesture production is based on computational modelling: we present GNetlc, a probabilistic network to model decision-making in the generation of iconic gestures (Bergmann & Kopp, 2009). Individual as well as general networks are learned from annotated corpora by means of automated machine learning techniques and supplemented with rule-based decision making. Three different types of factors are included in the network to influence the resulting gestures: (1) visuo-spatial referent features, (2) linguistic and discourse context, and (3) the previously performed gesture. Employed in an architecture for integrated speech and gesture generation, the system predicts speaker-specific gestures for virtual agents.

Analyzing the modelling results enables us to gain novel insights into the production process of iconic gestures: the resulting networks learned for individual speakers differ in their structure and in their conditional probability distributions, revealing that individual differences are not only present in the overt gestures, but also in the production process they originate from. Whereas gesture production in some individuals is, e.g., predominantly influenced by visuo-spatial referent features, other speakers mostly comply with the discourse context. The conclusion to be taken is therefore that the GNetlc simulation approach beside allowing an adequate simulation of speaker-specific gestures (as shown in a corpus-based evaluation of the system), is an valuable means to shed light onto the open research questions of (1) how iconic gestures are shaped and (2) which sources individual differences in gesturing may originate from.

References

- Bavelas, J., Gerwing, J., Sutton, C., & Prevost, D. (2008). Gesturing on the telephone: Independent effects of dialogue and visibility. *Journal of Memory and Language*, 58, 495–520.
- Bergmann, K., & Kopp, S. (2009). GNetlc—Using Bayesian Decision Networks for Iconic Gesture Generation. In Z. Ruttkey et al. (Eds.), *Proceedings of IVA 2009* (pp. 76–89). Berlin: Springer.
- Bergmann, K., & Kopp, S. (in press). Systematicity and Idiosyncrasy in Iconic Gesture Use: Empirical Analysis and Computational Modelling. In S. Kopp & I. Wachsmuth (Eds.), *Gesture in Embodied Communication and Human-Computer Interaction* (LNAI 5934). Berlin: Springer.
- Hostetter, A., & Alibali, M (2007). Raise your hand if you're spatial—Relations between verbal and spatial skills and gesture production. *Gesture*, 7(1):73–95.

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Metaphorical gestures of time

There is quite a substantial body of cross-linguistic research on metaphors of time. Notably this research is primarily based on verbal data (cf. Radden 2004, Moore 2006) and so far only few studies focused on verbal and gestural data (Calbris 1990, Cooperrider & Núñez 2009, Núñez & Sweetser 2006).

Looking at verbal as well as gestural metaphors, necessarily implies studying metaphors as they are used in a discourse. (Cienki & Müller 2008) The study to be presented here focuses on a linguistic analysis how meaning was constructed across speech and gesture in discourse. The results from this German data on dyadic naturally occurring conversations reveals a striking facet of how time may be conceptualized as space in gesture and speech. It was found that speakers localize time on two axes, in four directions, using various forms of gestures. Time is placed on the sagittal axis (front-back) and on the horizontal axis (left-right). Yet these axes are not used equally in both modalities: the horizontal axis is only used in gesture, whereas the sagittal axis is used in both modalities. We face here another case of a metaphor expressed in gesture only.

Gesturally there are variations in where and how time is localized. First of all in gesture speakers use the two axes. They gesture to the front and to the back (i.e. on the sagittal axis) and to the right and the left (i.e. on the horizontal axis). Verbally time is only located on the sagittal axis as future is in front and past is in the back. Gesturally, in contrast, speakers use both axes. Time is located on the sagittal and on the horizontal axis which means that the future is conceptualized as being in front or to the right and past is conceptualized as being in the back or to the left. Speakers point and act onto both axes into the different directions. But they do more than pointing upon these axes. Speakers use different gestural forms and hence display different gestural conceptualizations of time on these respective axes: leaps, circles, listings and various moving handforms into all four directions. In addition, the present (the “now”) is gesturally located right where the speaker stands and where the two axes cross.

To conclude: this piece of research indicates the importance of including gesture analysis in metaphor research because gestures may provide information unavailable from purely verbal data.

References

- Calbris, G. (1990) *The Semiotics of French Gestures*. Bloomington, IU Press.
- Cienki, A. & C. Müller (2008) Metaphor, Gesture, and Thought. In: R. W. Gibbs, Jr. (Ed.) *The Cambridge Handbook of Metaphor and Thought*. Cambridge: Cambridge University Press, 483–501.
- Cooperrider, K. & R. E. Núñez (2009) Across time, across the body. *Transversal temporal gestures. Gesture* 9:2, 181–206.
- Moore, K. (2006) Space-to-time mappings and temporal concepts. *Cognitive Linguistics*, 17 (2), 199–244.
- Núñez, R. E. & E. Sweetser (2006) With the future behind them: Convergent evidence from Aymara language and gesture in the crosslinguistic comparison of spatial construals of time. *Cognitive Science*, 30, 1–49.
- Radden, G. (2004) The Metaphor TIME AS SPACE across languages. In: N. Baumgarten, C. Böttger, M. Motz, J. Probst (Eds.) *Übersetzen, Interkulturelle Kommunikation, Spracherwerb und Sprachvermittlung – das Leben in mehreren Sprachen: Festschrift für Juliane House zum 60. Geburtstag*, Bochum: AKS-Verlag, 225–238.

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Gestures in the 4th dimension

Scientific research on gestures has been dominated since its inception in the nineteenth century by two-dimensional models involving the frozen configurations of dynamic morphologies. The constraints implied by the medium in which gestures are still usually represented in the published literature in the form of drawings or photographs for the purpose of data recording and analyzing greatly limit the graphic coding of the third and fourth dimensions which, most of the time, are taken for granted. In addition, gestures are principally examined in current research with respect to their capacity to convey visual information from an “objective” observational point of view that construes a two-dimensional template within which they can be schematized. For the purpose of studying dyadic interactions, gestures are projected on a plane which reduces necessarily 3-D events to 2-D representations. Whatever meaning may be involved in relation to the various degrees of proximity between interacting agents, including touch, remains fuzzy and elusive. But the challenge is compounded if gestures are heuristically conceptualized, as they should, as 4-D instances of communication. The constraints of the printed medium make it difficult if not impossible to significantly include temporal information such as absolute and relative duration with respect to a temporal baseline, tempo, rhythm structures, accelerating and decelerating curves, and the like. This is all the more regrettable since all gestures necessarily involve time as a source of distinctive features.

The purpose of this paper is to advocate the inclusion of the fourth dimension as an essential component of gestures and to propose possible methods in order to make this inclusion operational for the analysis of gestures. Naturally, video recordings provide temporal information but current analytical methods have not solved the issue of determining the exact boundaries of gestures, thus making precise chronometrics difficult to implement. This is why bringing time into focus requires an operational topology of gestures. The example offered for the demonstration will be a short segment from a circus act which shows two musical clowns interacting.

A 4-D model of gestures – including a heuristic determination of gesture boundaries – will be outlined in conclusion. Such a model is necessary if one is to understand the role of gestures in evolution, notably in terms of social cohesion, task coordination, and silent communication. The temporal structure of gestures is a crucial factor of adaptation which can be assumed to have been fine-tuned by natural selection.

Relative speed and tempo are indeed factors of adaptation at least in two respects: setting the time frame for interaction and controlling the template for action and communication. Moreover, the time structure of gestures is what may determine the perceptual saliency and pregnancy of some gestures that become imitated and spread in a population. Therefore, it can be concluded that the factorization of time in the analysis of gestures will allow a better understanding of gestures both from the point of view of biological evolution and from the point of view of cultural evolution. ©Bouissac 2009

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Pounding the verbal utterance: Forms and functions of beats

So far, beats (McNeill 1992) or batons (Efron 1941, Ekman & Friesen 1969) have been described as gestures serving a prosodic function: they coincide with the rhythm of speech, marking accent and pitch of the verbal utterance (Loehr 2006, McClave 1994, McNeill 1992 et al.). Beats tend to be biphasic gestures consisting of a “simple flick of the hand up and down, or back and forth” (McNeill 1992: 15). They are usually considered to carry no semantic content themselves unless they are superimposed on other types of gestures (Alibali & Heath 2001, McNeill 1992), and it has been proposed that their main function is to signal narrative shifts in discourse (McNeill 1992; Loehr 2006).

So far, the relation of beats to the accompanying speech has been only investigated in relation to prosodic prominence in spoken language, types of accents, variations in pitch and stressed syllables. Moreover, systematic investigations on gestural form features of beats are scarce (Alibali & Heath 2001, Sowa 2006, Wilson et al. 1996, inter alia).

This paper systematically addresses forms and functions of beats from the point of view of multimodal grammar (Fricke 2008, Müller et al. 2005). It investigates beats in relation to each other as well as in relation to the verbal utterance on the phonological, morphological and syntactic levels. Based on sequences of beats within a gesture phrase (Kendon 2004), which were taken from a German corpus of naturally occurring conversations as well as televised debates, discussions and game shows, first results of a comprehensive study on repetitions in coverbal gestures will be presented (Bressemer in prep.).

These reveal that beats correspond to different structural aspects of the verbal utterance and thus show different ranges. Whereas one type of beat marks prosodic aspects of the accompanying utterance, such as accents or the syllable structure of words, another type operates on the prosodic as well as the morphological and/or syntactic structure of verbal utterance (cf. Birdwhistell 1970) and, furthermore, carries semantic content of the utterance. Differences in the range of beats to the verbal utterance are thereby reflected on the level of gestural forms. Accordingly differing hand shapes and orientations of the hand were documented for the different types of beats. Moreover, the relation of beats to the verbal utterance is reflected in the number of repetitions and length of beat sequences itself.

Using the example of beats, the paper addresses the question of how gesture and speech are “integrated [and], produced under the guidance of a single aim” (Kendon 2004: 3) by using a linguistic approach to gesture (Fricke 2008, Ladewig in prep., Müller 1998).

References

- Alibali M. W. & Heath, D. C. (2001). Effects of Visibility between Speaker and Listener on Gesture Production: Some Gestures Are Meant to Be Seen. *Journal of Memory and Language* 44, 169–188.
- Birdwhistell, R. (1970). *Kinesics and Context*. Pennsylvania, University of Pennsylvania Press.
- Bressemer, J. (in prep.). Phonological and morphological patterns of repetitions in gesture and speech (preliminary title). Phd thesis.
- Efron, D. (1941/1972). *Gesture, race and culture*. The Hague: Mouton.
- Ekman, P. and W. V. Friesen (1969). “The Repertoire of Nonverbal Behavior: Categories, Origins, Usage and Coding.” *Semiotica* 1: 49–98.
- Fricke, E. (2008). Grundlagen einer multimodalen Grammatik des Deutschen: Syntaktische Strukturen und Funktionen. Faculty of Social and Cultural Sciences: European-University Viadrina, Frankfurt/Oder. Unpublished habilitation thesis.
- Kendon, A. (2004) *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Ladewig, S. (in prep.) It has a certain [gesture]: Syntactic and semantic integration of gesture into speech. (preliminary title). Phd thesis.
- Loehr, D. (2006). *Gesture and intonation*. Washington DC. Phd thesis.
- McClave, E. (1994). Gestural beats: The rhythm hypothesis. *Journal of Psycholinguistic Research*, 23(1), 45–66.

McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. University of Chicago Press.

Müller, C. (1998). *Redebegleitende Gesten: Kulturgeschichte–Theorie–Sprachvergleich*. Berlin: Arno Spitz.

Sowa, T. (2006). *Understanding coverbal iconic gestures in object shape descriptions*. Berlin, Akademische Verlagsgesellschaft Aka GmbH.

Wilson, A. et al. (1996). *Recovering the temporal structure of natural gesture*. International Conference on Automatic Face and Gesture Recognition Los Alamitos, California, IEEE Computer Society Press.

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A multifocal account of multimodal interaction

Face-to-face interaction requires speakers and their utterances to be geared to one another in multiple ways so as to facilitate fluent conversation. This interactive coordination process requires alignment between the speakers in the different modalities of interaction, from the linguistic level to bodily semiotics, including gesture and posture. Recent work in (psycho)linguistics and gesture research has started to explicitly incorporate dialogicity – from a multimodal perspective – in cognitive discourse models (Pickering & Garrod 2004; Du Bois 2007, Kimbara 2006). In embracing shared cognition, these models aim to bridge the traditional gap between cognitively oriented accounts of language and interactional approaches.

In order to allow for a fine-grained view on the multimodal and multifocal aspects of language use, discourse models need to resort to new multimodal methods. In this paper, we introduce one such method that tracks speakers' perspectives and behaviour using head-mounted eye trackers. By recording two interlocutors' perspectives and eye movements during online face-to-face interaction, we obtain a 3-D landscape of the conversation, including production (scene camera, sound) and processing (eye movements) information.

In two experiments, we applied the bidirectional method to inquire into the multimodal aspects of interactive alignment. In a first experiment, the co-participants jointly described animations depicting spatial scenario's running along image schematic lines. In the second experiment, participants were asked to jointly construe a narrative on the basis of a single image depicting a real-life scene. The experiments reveal a gradual process of interactive routine building during the description and narrative tasks, both at the level of linguistic choice and gestures. The eye-tracking data of the individual participants offer a window on which behavioural features are processed and picked up in the alignment process on the one hand, and which eye-movement patterns emerge when producing a co-ordinated utterance on the other hand.

Since conversation can be regarded as a joint action (Clark, 1996) rather than a linear series of utterances, it would only seem obvious to maximally embrace the interlocutors' perspectives in an empirical study of conversation. The two conducted experiments serve to illustrate that the bidirectional approach yields a fine-grained view of the interactive co-ordination of different modalities in face-to-face interaction.

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Communicative intention modulates representational and pragmatic gestures – Gesturing for novices and children in Sicily

One of the major controversies in our understanding of co-speech gesture production concerns to what extent they are communicatively intended and how communicative context shapes gesture. Previous research has shown that representational gestures (cospeech gestures that bear a resemblance to referents) are sensitive to dialogic aspects of the communicative situation as well as to their visibility by the addressees (Bavelas et al, 2007), to shared gesture space (Özyürek, 2000), and to the common ground knowledge among the participants (Holler & Wilkin, 2009). These effects have been shown for gestures used in narratives and picture/shape descriptions. In order to understand more broadly how communicative intention might modulate gestures of different types (representational and pragmatic), their sensitivity to different aspects of the communicative situation and in a different communication type, we asked speakers to give instructions of the same content (how to make coffee) in different conditions where addressee's knowledge (expert vs. novice) and age (adult vs. child) were separately manipulated.

12 adult Italian speakers in Sicily were asked to read set of familiar instructions about how to make coffee (with a caffettiera) and then to tell them in 3 separate conditions: a) to an adult who already knows how to make coffee (expert-adult), b) to an adult (novice-adult) and c) to a child (12 yrs) (novice-child) who don't know how to make coffee. A within-subject design was used and the order of conditions was counterbalanced. In order to control for the dialogic aspect of the communicative setting we asked all speakers to give the instructions to a camera. They were told that the 'intended' addressees are going to watch the films later and make coffee accordingly. Both the addressees' 'assumed' knowledge state and age independently influenced speech and gesture. Speakers gave more verbal object descriptions and explained coffee making in more steps and also used also more representational gestures per word across the conditions in the following order: novice-child>novice-adult>expert-adult. Furthermore representational gestures were more two-handed, demonstrative (oriented toward camera), and were focused on by points of the other hand or speaker's eye gaze, most frequently in the novice-child, lesser in novice-adult and the least in the expert-adult conditions. However, speakers used fewer pragmatic gestures, (e.g., gestures of the Palm Up family (Kendon, 2004)), in the child than in both of the adult conditions—a trend opposite of found for representational gestures.

These results show that different gesture types are produced with different communicative intent and are modulated by different aspects of the communicative situation (age/expert-novice)-even when this situation is "assumed" and does not involve 'real' face-to-face interaction. Findings will be discussed for their implications for models that propose different roles of communicative intent for gesture production and especially for more recent ones that mainly emphasize the role of embodied simulation of actions in gesture production (Hottsteter & Alibali, 2008).

References

- Bavelas J., B., Gerwing J., Sutton C., Prevost D. (2008) Gesturing on the telephone: independent effects of dialogue and visibility. *Journal of Memory and Language* 58; 495–520.
- Holler J., Wilkin K. (2009) Communicating commonground: How mutually shared knowledge influences speech and gesture in a narrative task, *Language and Cognitive Processes* 24; 267–289.
- Hostetter A. B., & Alibali M.,W.,(2008), Visible embodiment: gestures as simulated action, *Psychonomic Bulletin and Review* 15 495–514.
- Kendon A. (2004). *Gesture. Visible action as utterance*. Cambridge University Press, Cambridge.
- Özyürek A. (2000). The influence of addressee location on spatial language and representational gestures of direction, in McNeill D. (eds), *Language and gesture*, Cambridge University Press, Cambridge.

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Good and bad in the hands of politicians: How gestures reveal speakers' attitudes and influence recipients' opinions

In language, good things are often associated with the right and bad things with the left (e.g., my right hand man; two left feet). Likewise in gesture, good is conventionally associated with right and bad with left, across cultures (e.g., Americans raise their right hand to swear an oath; Ghanaians are prohibited from gesturing with the left hand [Kita & Essegby, 2001]).

Yet, people's implicit associations do not always follow these explicit linguistic and gestural conventions. Rather, implicit mappings from left-right space to ideas with positive and negative emotional valence follow patterns of bodily experience. In laboratory studies, people implicitly associate good things with their dominant side of space and bad things with their non-dominant side (Casasanto, 2009).

Here we investigated whether 'mental metaphors' linking left-right space with positive and negative valence are evident in spontaneous co-speech gestures (Experiment 1), and whether the hand that speakers use to gesture can influence how recipients feel about the content of their verbal message (Experiment 2).

For Experiment 1, we analyzed relationships between the speech and gesture produced by US presidential candidates during the final debates of the 2004 and 2008 elections. Serendipitously, both of the candidates from 2004 were right-handed (Kerry, Bush), and both candidates from 2008 were left-handed (Obama, McCain). First, all spoken clauses were classified as Positive, Negative, or Neither, by raters blind to the gestures that accompanied them. Next, the hand used for each gesture stroke was coded (left, right, or bimanual), and confirmed by an independent rater who was "deaf" to the speech. Finally, associations were tested between the hand used for each of the 763 uni-manual gestures (left, right) and the valence of the accompanying speech (positive, negative).

In every candidate, dominant-hand gestures were associated more strongly with speech about good things, and non-dominant-hand gestures with speech about bad things ($\chi^2=12.65$, $p=.0004$). It was not simply the case that people gestured more with their dominant hands; right- and left-handers also gestured in contrasting ways, suggesting that they automatically activated contrasting associations between space and valence.

Experiment 2 investigated the effect of right- and left-hand gestures on right- and left-handed recipients. 374 English speakers saw still photos captured from the debates. Each candidate was captured making one right-hand and one left-hand gesture, and these photos were presented either as-captured or mirror-reversed. Across subjects, photos were paired an equal number of times with each of 12 written statements. Participants evaluated how strongly they agreed with each statement.

For all candidates, gestures influenced participants' evaluations of the accompanying statements. Right-handers agreed more strongly with statements accompanied by right-hand gestures, whereas left-handers agreed more strongly with statements accompanied by left-hand gestures. Overall, participants agreed most strongly with statements accompanied by right-hand gestures ($p=.03$), due to the large majority of right-handers; apparently, to persuade voters, politicians should make right-hand gestures!

Results show that, implicitly, good is right in right-handers but good is left in left-handers' minds. Uni-manual gestures reveal speakers' attitudes, and also influence recipients' opinions about the content of their message.

References

Casasanto, D. (2009). Embodiment of Abstract Concepts: Good and bad in right- and left-handers. *Journal of Experimental Psychology: General* 138(3), 351–367.

Kita, S. and Essegby, J. (2001): Pointing left in Ghana: how a taboo on the use of the left hand influences gestural practices. *Gesture*, 1(1), 73–95.

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The nature of the beneficial role of spontaneous gesture in spatial problem solving

Spontaneous gestures play an important role in spatial problem solving (Chu & Kita, 2008; Ehrlich, Levine, & Goldin-Meadow, 2006; Trafton et al., 2006). However, little is known about whether gestures can improve spatial problem solving, and if so, how do they enhance spatial problem solving. The present study investigated the functional role and underlying mechanism of spontaneous gestures in spatial problem solving. In Experiment 1, participants were required to solve a mental rotation task (see Figure 1) without speaking. They needed to decide whether the lower object was the same as the upper left or the upper right object.

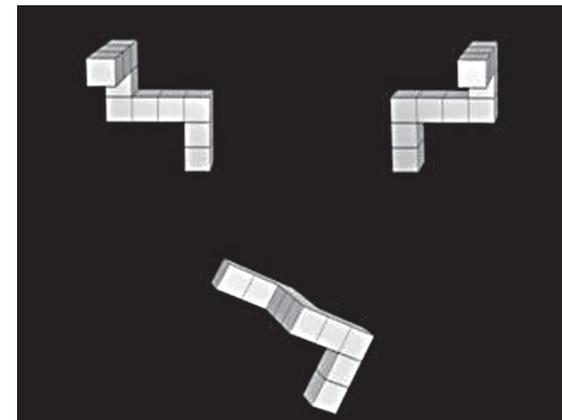


Figure 1. An example stimulus of the mental rotation task in Experiment 1.

They responded with two foot-pedals and their gestures were recorded by a hidden camera. We found that participants gestured more frequently in difficult trials than in easy trials. Thus, difficulty in spatial problem solving can trigger gestures. In Experiment 2, participants were given two identical sets of mental rotation problems, which are the same as the one used in Experiment 1 except that the trial length were fixed. Participants were randomly assigned to three groups: the gesture-encouraged group, the gesture-allowed group and the gesture-prohibited group. In the first set of mental rotation problems, the gesture-encouraged group was encouraged to move their hands whenever they thought it might be helpful, the gesture-allowed group was not informed about gesturing and the gesture-prohibited group was required to sit on their hands. In the second set of mental rotation problems, all three groups were required to sit on their hands while solving the problems. We found that the gesture-encouraged group performed better than the gesture-allowed and the gesture-prohibited groups both in the first and second sets. Thus, gesture not only benefits spatial problem solving when gesture occurs, but the beneficial effect can last to the subsequent mental rotation task, in which gesture are not available. In Experiment 3, we used the same procedure as in Experiment 2, except that we replaced the second set of non-gesturing mental rotation problems by a non-gesturing paper folding problems (see Figure 2) and there was no gesture-prohibited group.

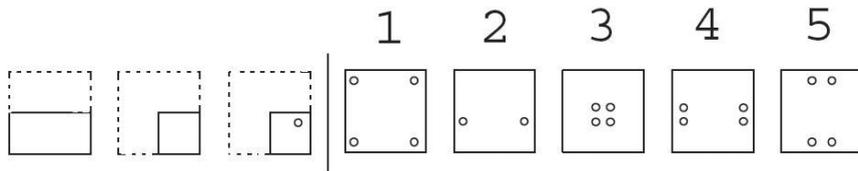


Figure 2. An example stimulus of the paper folding task in Experiment 3

We found that the gesture-encouraged group performed better than the gesture-allowed group both in the first set of mental rotation problems and in the second set of non-gesturing paper folding problems. We concluded that gesture indeed improves spatial problem solving. Furthermore, gesture has a lasting beneficial effect even when gesture is not available and the beneficial effect is problem-general. We suggested that gesture enhances spatial problem solving by improving the internal computation of spatial transformation, as both mental rotation task and paper folding task require similar spatial transformation processes (Wright et al., 2008).

References

- Chu, M., & Kita, S. (2008). Spontaneous gestures during mental rotation tasks: Insights into the microdevelopment of the motor strategy. *Journal of Experimental Psychology: General*, 137, 706–723.
- Ehrlich, S. B., Levine, S., & Goldin-Meadow, S. (2006). The importance of gesture in children's spatial reasoning. *Developmental Psychology*, 42, 1259–1268.
- Trafton, J. G., Trickett, S. B., Stitzlein, C. A., Saner, L., Schunn, C. D., & Kirschenbaum, S. S. (2006). The relationship between spatial transformations and iconic gestures. *Spatial Cognition and Computation*, 6, 1–29.
- Wright, R., Thompson, W. L., Ganis, G., Newcombe, N. S. & Kosslyn, S. M. (2008). Training generalized spatial skills. *Psychonomic Bulletin and Review*, 15, 763–771.

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Co-speech gestures do not originate from speech production processes

Co-speech gestures and speech production are closely interlinked. However, it is unclear whether these two systems are inherently inseparable (e.g., McNeill, 1992) or are two interactive but independent systems (e.g., Kita & Özyürek, 2003). The current study investigated this topic by examining the relationship between co-speech and co-thought gestures. Co-thought gestures are those produced during the silent thinking process without speaking. They are presumably generated outside speech production process. If co-speech gestures originate from speech production process, co-speech and co-thought gestures should not have any systematic relationship (see Figure 1a). In contrast, if co-speech and co-thought gestures both originate from a common system outside speech production system (e.g., an Action Generator that is directly linked to spatial and motoric thinking), there should be a systematic relationship between the two behaviours (see Figure 1b).

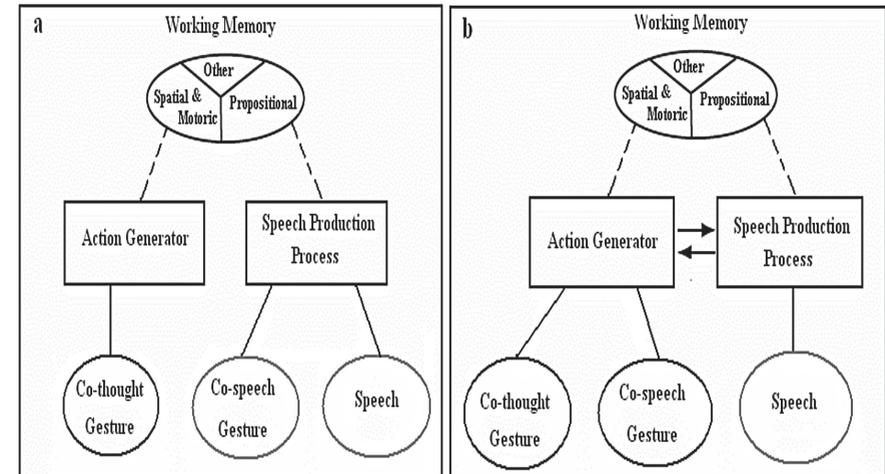


Figure 1. Two possible mechanisms underlying the production of co-thought and co-speech gesture.

In Experiment 1, co-thought gestures were elicited by a non-speaking mental rotation task (see Figure 2), in which participants decided whether the lower object is the same as the upper left or upper right object. Co-speech gestures were elicited by a geometric shape motion description task, in which participants were required to describe some motion events both in a face-to-face setting and in a tape recorder setting. We used a within-subject design. Participants were first given the mental rotation task. Then they were then given half of the description task in one condition. After 30 minutes, they completed the second half of the description task in the other condition.

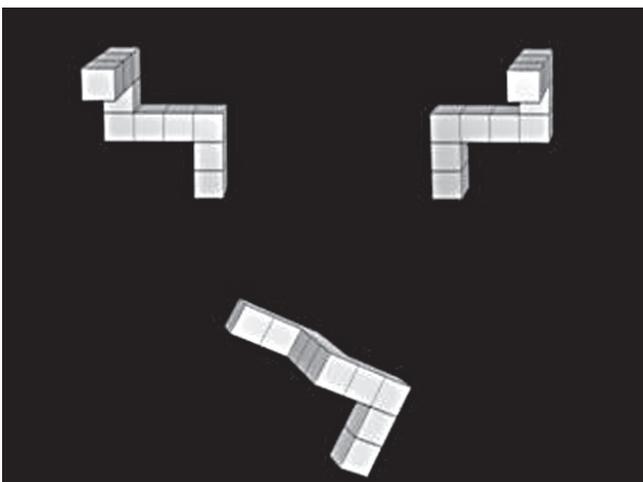


Figure 2: An example stimulus of the mental rotation task

We found that the rates of co-thought gestures were significantly positively correlated with the rates of co-speech gestures in both conditions. This result indicates that co-thought and co-speech gestures originate from a common mechanism that is independent from speech production process. Furthermore, we found no correlation between the rates of self-touches (the hand movements that touch one's own body or its adornments) and the rates of co-thought or co-speech gestures. This indicates that the correlation between co-thought and co-speech gesture is not due to individual's motor threshold, which is the minimal activation level in the motor system at which a motor response is triggered. If the correlation between co-thought and co-speech gestures was simply because participants with a lower motor threshold were generally more likely to move their hands than those with a higher motor threshold, people who produced more co-thought and co-speech gestures should have produced more self-touches as well. In Experiment 2, we used the same stimuli and procedure as we used in Experiment 1, except that, in the mental rotation task, participants were given a secondary verbal shadowing task to SUPPRESS inner speech, so that the production of co-thought gestures did not involve any speech production process. Again, we found a significant positive correlation between the rates of co-thought and co-speech gestures.

References

- Kita, S., & Özyürek, A. (2003). What does cross-linguistic variation in semantic coordination of speech and gesture reveal? Evidence for an interface representation of spatial thinking and speaking. *Journal of Memory and Language*, 48, 16–32.
- McNeill, D. (1992). *Hand and Mind*. Chicago: University of Chicago Press.

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Gesture and frame knowledge

Cognitive frames consist of “roles,..., relations between the roles, and scenarios carried out by those playing the roles” (Lakoff 2008: 22). In Fillmore's (1977a, 1977b, 1982, 1992) frame semantics, “meanings are relativized to scenes” (1977a:59), and the sentence indicates a “PERSEPECTIVE on the situation” (1977a: 61). Thus, the concept underlying a word activates a frame of semantic knowledge of an event, and the associated linguistic construction represents the highlighted portion of the scenario. Based on casual daily conversations in Mandarin Chinese, the present study shows that spontaneous hand gestures can also convey frame knowledge not linguistically realized in speech. The interpretation of this type of gestures is also relativized to scenes. In an utterance about the total working hours during summer vacation, the words *liang-bai-er-shi-liu* ‘two hundred and twenty six’, *ge* ‘classifier’, *xiaoshi* ‘hour’, *zuo* ‘work’, *liang* ‘two’, *ge* ‘classifier’, and *yue* ‘month’ activate the frame of the school-part-time-job event. Thus, moving the right index finger on the thigh several times can be interpreted as calculating the pay in the scene.

Knowledge in the cognitive frames is embodied in daily social interaction and experiences. Different kinds of frame knowledge conveyed by gestures without lexical affiliates were found. The first kind suggests general knowledge about things or relationships. In a social gathering scene, words like *tanpiao* ‘soup spoon’ and *kuaizi* ‘chopstick’ evoke the frame of food utensils; gesturing the frame knowledge regarding what people do with soup spoons and chopsticks conveys general knowledge. Another kind is culture-specific knowledge, like moving the hand as if writing down students’ names on a seat-allocation table can only be understood within the academic-monitor *xueyi* frame in Taiwan junior high. A third kind of frame knowledge represents personal experiences. For instance, it is general knowledge to have a means of transportation in the having-a-ride event; what's personal in the frame is the particular vehicle being referred to—motorcycle—and gestured by holding the hands in a fist at each side of the body. In addition to revealing frame knowledge, the imagistic information being chosen is also crucial to understanding the perspective being chosen in talking about a particular event. It represents a profile, a focus of attention, since “anything selected is rendered prominent relative to what is unselected” (Langacker 2008: 66). The gestures are largely performed in the central gesture space (McNeill 1992) with noticeable and discernable configurations.

To conclude, language and gesture collaborate to unfold and bring into perspective different parts of a scene. While the cognitive scenes are activated by utterances, the frame knowledge can be conveyed by other channels in multimodal communication. Gestures without lexical affiliates are interpretable and understandable since they are framed in a scene. Their occurrences reveal our general and personal understanding of different kinds of events, and the portion of the scene being profiled.

References

- Fillmore, Charles J. 1977a. The case for case reopened. In P. Cole and J. Sadock (Eds.), *Syntax and Semantics: Grammatical Relations*, Vol. 8, 59–81. Academic Press Inc.
- Fillmore, Charles J. 1977b. Topics in lexical semantics. In *Current Issues in Linguistic Theory*, ed. R. W. Cole, 76–138. Bloomington: Indiana University Press.
- Fillmore, Charles J. 1982. Frame semantics. In T. L. S. of Korea (Ed.), *Linguistics in the Morning Calm*. Seoul: Hanshin Publishing Company.
- Fillmore, C. J., & Atkins, B. T. 1992. Toward a frame-based lexicon: The semantics of RISK and its Neighbors. In Lehrer, A. & Kittay, E. F (Eds.), *Frames, Fields, and Contrasts*, 75–102. Hillsdale, NJ: Lawrence.
- Lakoff, George P. 2008. *The political mind: Why you can't understand 21st-century American politics with an 18th-century brain*. USA: The Penguin Press.
- Langacker, Ronald W. (2008) *Cognitive Grammar: A Basic Introduction*. New York: Oxford University Press.
- McNeill, David. 1992. *Hand and mind – What gestures reveal about thought*. Chicago: The University of Chicago Press.

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What can word-finding gestures in aphasia tell us about the language system?

There is a limited body of research which has investigated the gestures produced by people with aphasia alongside narratives. There is some research on the frequency of gestures produced and also gestures produced without speech as alternative to verbal language. Furthermore, Speech and Language Therapists rarely analyse iconic gesture when assessing a client with aphasia, despite a growing body of research suggesting that language and gesture are part of either the same system (e.g. McNeill, 2000) or two highly integrated systems (e.g. Kita & Özyürek, 2003).

The aim of this study was to determine whether the iconic gestures produced by two people with communication difficulties – classified by the Western Aphasia Battery (Kertesz, 2006) as ‘conduction aphasia’ – provide information about why they were experiencing language difficulties.

To do this we compared the iconic gestures produced by two participants with conduction aphasia and five control participants produced during the retelling of the ‘Canary Row’ Sylvester and Tweety cartoon. In particular we compared the iconic gestures produced during production difficulties with the iconic gestures produced during fluent speech.

The study found that although some of the co-speech gestures produced by the participants with conduction aphasia resembled the co-speech gestures produced by the control participants, they both also produced gestures alongside pauses in their speech associated with word-finding difficulties. Furthermore these word-finding gestures were unlike their co-speech gestures and unlike the co-speech gestures produced by the control participants. Most interestingly, the gestures produced by the participants with aphasia that could be systematically related to the level of breakdown in their language system. This is crucial because all participants were classified by a commonly used verbal assessment tool as having the same type of aphasia. These results challenge the routine practice by Speech and Language Therapists of focussing on verbal language and ignoring gesture.

Very little is known about the gestures produced by people with aphasia. This study describes the iconic gestures produced by two participants who have a diagnosis of ‘conduction aphasia’. Specifically the study looks at two types of gesture that they both use, gestures produced during fluent speech and gestures produced during word-finding difficulties. The results indicated that the iconic gestures produced by each participant reflected the level of breakdown of her language system, and crucially differentiated between them notwithstanding their similar diagnosis. It is concluded that gesture analysis should be seen as an important addition to the Speech and Language Therapist’s assessment toolkit.

References

- Kertesz, A. (2006). *Western Aphasia Battery-Revised*. San Antonio, TX: Harcourt Assessment.
- Kita, S., & Özyürek, A. (2003). What does cross-linguistic variation in semantic co-ordination of speech and gesture reveal?: Evidence of an interface representation of spatial thinking and speaking. *Journal of Memory and Language*, 48, 16–32.
- McNeill, D. (2000). *Language and Gesture*. Cambridge: Cambridge University Press.

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Gesture improves retention and transfer of symbolic learning in adults

Learners often have surprising difficulty mapping symbolic knowledge from one domain to another, even when given explicit cues to do so (Kaminski et al., 2008). One way to increase learners’ ability to transfer information to different domains might be to provide learners with concrete representations that can be efficiently ported from one situation to another. One such representation is hand gestures. Because gestures derive much of their meaning from the supporting context, the exact same gestures can apply to a wide variety of similar problems. Thus, gesture may be a useful tool for helping learners transfer their knowledge to new problems and new problem types.

Indeed, in children, when hand gesture is included in instruction, learning of mathematical concepts increases and is more likely to be maintained over time (Cook & Goldin-Meadow, 2006; Cook, Mitchell & Goldin-Meadow, 2008). However, despite the considerable evidence that gesture contributes to mathematical learning in children, nothing is known about how gesture affects mathematical learning in adults. Unlike children, adults are experienced language users who may be less reliant on external cues for successful learning of new concepts – advanced learners often do not benefit from redundant information presented during learning (Kalyuga, Chandler, Sweller, 1998, Mayer & Johnson, 2008).

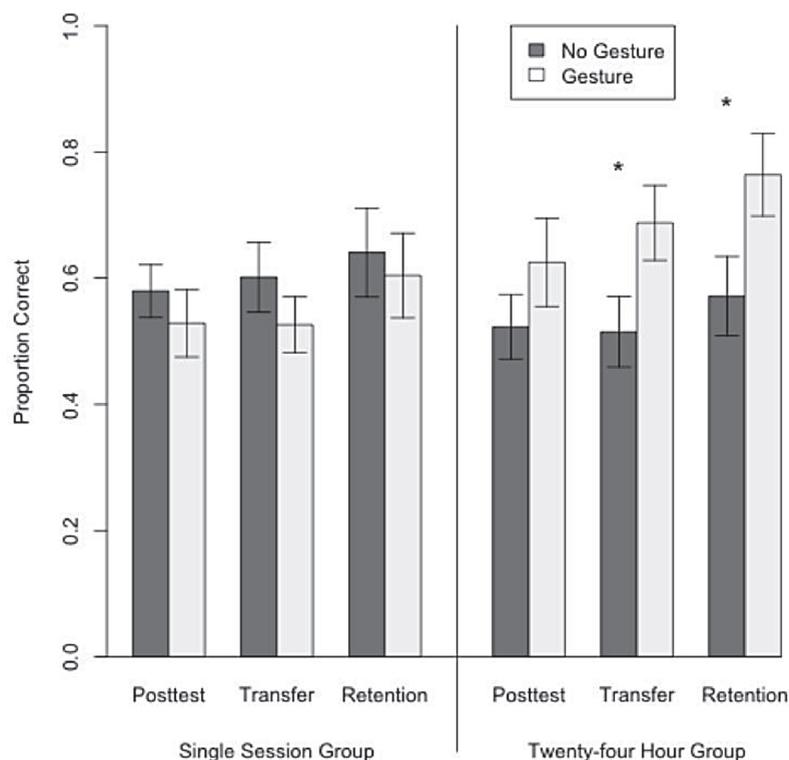
To explore the role of gesture in learning of new symbolic knowledge and transfer of learning in adults, we taught adults a new algebraic symbol system (adapted from Kaminski et al. (2008). Adults were trained using a gesture paradigm based on one previously used to study the role of gesture in learning of mathematical concepts in children (Cook & Goldin-Meadow, 2006; Cook, Mitchell & Goldin-Meadow, 2008). We trained adults using the same sort of words and gestures previously shown to facilitate learning in children in which both the speech and the gesture express precisely the same meaning; the gesture is therefore redundant with the speech. Performance was tested both immediately after learning and 24 hours later.

We found that gesture improves maintenance and subsequent transfer of learning of abstract concepts. On the immediate test, participants in the Gesture and No Gesture groups were not reliably different from one another. However, twenty-four hours later, reliable differences between groups emerged. On both the Transfer test (an isomorphic symbol system which the participants had never experienced) and on the Retention test (the trained symbol system) participants in the Gesture condition performed significantly better than those in the No Gesture Condition. Thus, instruction with gesture had an effect on learning that emerged over time.

These findings suggest that gesture may be interacting with processes in the intervening time period to help adults consolidate learning, and to transfer this knowledge to new situations. Memory consolidation can strengthen a memory and even enhance memory performance above levels seen immediately after training, similar to the pattern observed here. Gesture may be interacting with processes in the intervening period, like sleep, to produce memories that are particularly likely to be maintained over time.

References

- Cook, S. W. and Goldin-Meadow, S. (2006). The role of gesture in learning: Do children use their hands to change their minds. *Journal of Cognition and Development*, 211–232.
- Cook, S. W., Mitchell Z., and Goldin-Meadow, S. (2008). Gesturing makes learning last. *Cognition*, 106, 1047–1058.
- Kalyuga, S., Chandler, P. & Sweller, J. (1998). Levels of expertise and instructional design. *Human Factors*, 40, 1–17.
- Kaminski, J.A., Sloutsky, V.M., Heckler, A.F. (2008). The Advantage of Abstract Examples in Learning Math. *Science*, 320, 454–455.
- Mayer, R. E., & Johnson, C. (2008). Revising the redundancy principle in multimedia learning. *Journal of Educational Psychology*, 100, 380–386.



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Researching emotions in gestures and body movement

This talk addresses theoretical and methodological questions about how expressive aspects of gestural movements might be accounted for. The rise of gesture studies as field of inquiry in itself has been largely triggered by the path-breaking insight that gestures form part of speaking, that they express thoughts (McNeill 1992, 2005), that they communicate and form utterances out of visible actions (Kendon 2004), and that they participate in 'thinking for speaking—and gesturing' (Cienki & Müller 2008). The views taken here show a clearly cognitive bias, and the question of whether co-verbal gestures also have an affective dimension – of whether they express emotions at all – has not yet received systematic interest in this scientific community.

In this presentation we will put forward a theoretical framework which integrates the cognitive and the emotional dimensions of gestural movements. Relying on Bühler's (1982) theory of language, and on its application to gesture theory (cf. Müller 1998), and in conjunction with Buytendijk's (1956) theory of human body posture and movement, we propose that every verbal or gestural sign realizes three functions simultaneously: expression, representation or denotation, and appeal. Up to now, gesture studies have mainly addressed the functions of representation and appeal, while the expressive function has hardly received any systematic scholarly interest.

We will furthermore offer first steps towards a methodology that accounts for expressive qualities of co-verbal gestures and takes movement in the whole body into account. We are developing this methodology within the context of an interdisciplinary project on alexithymia (The term 'alexithymia' literally means 'having no words for feelings' and describes a personality trait characterized by a deficit in identifying, decoding, or communicating one's own feelings or emotional aspects of social interaction). A leading question is whether alexithymia is not only evidenced by a deficit in verbalizing emotional content, but also by a lesser capacity to embody emotional experience during communication. To investigate how alexithymic persons use language, body movement and gesture when talking about emotions, we are working within a conceptual framework that draws upon perspectives on human movement that have hitherto not been applied to gesture studies: Movement Pattern Analysis (Lamb 1965) and Laban/Bartenieff Movement Analysis (Bartenieff & Davis 1972, Bartenieff & Lewis 1980) are being adopted to supplement Müller's (2007) Methods of Gesture Analysis.

The goals of our talk are 1) to outline our theoretical and methodological framework for an integrated approach to the analysis of co-verbal gestures within the context of the whole body, and 2) to present the first results of a study in which we apply this framework to compare the movement characteristics of alexithymic and non-alexithymic subjects. In this study, we follow Lamb (1965) and Du Nann Winter et al. (1989) in postulating that the frequency of the occurrence of Posture-Gesture Mergers (PGMs) is a measure of the extent to which the whole person is authentically engaged in verbal communication. Specifically, we will focus on the results of quantitative and qualitative analyses of the PGMs produced by 100 subjects (51 alexithymic subjects and 49 controls) during a dyadic interview comprising questions to elicit knowledge about emotions (Lane et al. 1990) and an intelligence test (Wechsler 1991) which served as a control condition for speech and gesture production.

References

Bartenieff, I. & Davis, M. (1972). Effort-Shape Analysis of Movement. The Unity of Expression and Function. In M. Davis (Ed.), *Research Approaches to Movement and Personality*. New York: Arno Press Inc.

- Bartenieff, I. & Lewis, D. (1980). *Body Movement. Coping with the Environment*. New York: Routledge.
- Bühler, K. (1982) *Sprachtheorie. Die Darstellungsfunktion der Sprache*. Stuttgart/New York: Fischer.
- Buytendijk, F. J. J. (1956). *Allgemeine Theorie der menschlichen Haltung und Bewegung*. Berlin: Springer.
- Du Nann Winter, D., Widdell, C., Truitt, G., George-Falvy, J. (1989). Empirical Studies of Posture-Gesture Mergers. *Journal of Nonverbal Behavior*, 13(4), 207–223.
- Lamb, W. (1965). *Posture and Gesture: An introduction to the study of physical behaviour*. London: Gerald Duckworth & Co Ltd.
- Lane, R.D., Quinlan, D.M, Schwartz, G.E., Walker, P.A., & Zeitlin, S.B. (1990). The levels of emotional awareness scale: a cognitive-developmental measure of emotion. *Journal of Personality Assessment*, 55, 124–134.
- Müller, C. (1998). *Redebegleitende Gesten. Kulturgeschichte – Theorie – Sprachvergleich*. Berlin: Arno Spitz.
- Müller, C. (2007). MGA – Methods of Gesture Analysis. Unpublished Manual.
- Wechsler, D. (1991). *Der Hamburger-Wechsler Intelligenztest für Erwachsene. Revision (HAWIE-R)*. Bern: Huber.
- Welsche, M. (2009). *Die Analyse des Bewegungsverhaltens jugendlicher Mädchen mit depressiver Symptomatik. Eine explorative Bewegungsanalyse mit Vergleichsgruppe anhand der Laban Bewegungsanalyse*. Dissertation.

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Body posture and gesture: Another window into emotion? Adopting a multifunctional coding system for studying nonverbal communication

Gestures are studied in a wide area of body movement research, yet its role in communicating emotion has not been established. Emotion research has been strongly focused on facial and vocal expression. Contrary to the early assumption that the body only indicates emotional intensity, recent studies show that human body movements and postures also provide emotion specific information. Systematic research in the field is hampered by a lack of hypotheses on the one hand and a diverse collection of coding systems often tailored to specific research questions on the other hand. These produce selective descriptions of few emotions which cannot be compared.

For this research we developed an integrative coding system providing a time-based, micro description of body movement on the level of anatomical articulation, movement form, function and dynamics. Using this tool we analyzed bodily and gestural correlates of a representative set of emotions expressed in an interaction setting. On the basis of these results we discuss differential patterns of body movement accompanying different emotions.

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Two-action predicates in Thai Sign Language (ThSL)

Signs in sign languages are generally seen as gestures because they are visual-perceived and have the same mode of expression. In fact, signs in sign languages can be regarded as subset of gestures which are controlled by rules and limited in numbers. The signs in sign languages are different from words as they are not composed of any sound but they are composed of hand movement with other components which are aimed to contribute to the eye perception instead. Signs are simultaneously produced by sets of visual-perceived elements while words are sequentially produced by sets of audio-perceived elements which can be analyzed as linear.

To sign a clause with one-verb predicate is such an easy task for the Deaf and also sign language learners at beginner level. However, I observe that the Deaf sometimes spontaneously express two actions at the same time. Is it possible for them to sign two actions at the same time and how? Regarding to Danthanavanich (2008: 88), she has revealed that the modification of ThSL predicates which are expressed the two actions occurring in the same time can be signed those actions simultaneously as shown in examples below.



[READ-BOOK-WHILE-ON-BUS]
(taken from Danthanavanich, 2008)



[SMOKE-WHILE-READ-NEWSPAPER]

This grammatical feature is quite unique comparing with spoken or written language. In other word, it can be found only in sign language structure. This paper then aims to investigate the structure of predicates focusing on two-verb clauses in Thai Sign Language (ThSL).

The qualitative research methodology has been designed for this study. Data analyzed in this study was based on ten ThSL signing story telling from Deaf signers. The data collection procedures proceed in three steps as; collecting data, checking the data completeness, converting data into ready-used format for analyzing process. The process of data analyzing begins with transcribing into text-based format and free translation. Then, the text-based format data is examined its structure based on the conventional definition of “a clause” with focusing on two-verb predicates.

The expected result will cover the structure of the two-action predicates in ThSL. This will also be applied to all ThSL classes (both Deaf and hearing) in practicing in order to develop their ThSL skills.

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“Acha”: A case study of the perlocutionary force of gestures in Bengali

Gestures, we propose, are an interesting window into the interface between semantics and pragmatics. According to Austin (1962; p101), saying something involves performing a locutionary act (and within it the phonetic, the phatic, and the rhetic acts), an illocutionary act and a perlocutionary act. In this paper we focus on the last of the three; a perlocutionary act involves “production of certain consequential effects upon the feelings, thoughts, or actions of the audience, or of the speaker, or of other persons: and it may be done with the design, intention, or purpose of producing them.” However, unlike locutions, perlocutions are not semantically specified; consequently, their intent can be denied if the speaker is interrogated. Or, to put it another way, perlocutions are context-dependent, for their force is dependent on their context.

The perlocutionary force of an utterance is often associated with a semantic assembly (Langacker, 2008) constituted from multiple sources of information, from the sequence of sounds composing the utterance to the tight spatiotemporal co-occurrence of the sounds and gestures (from a single source) and eye gaze. The semantic assembly helps the speaker and listener connect the composite utterance’s multiple parts. (Enfield, 2009) Thus, in many contexts, the contextual element that gives a speech act its perlocutionary force is a non-iconic or non-representational gesture, such as a wink or a smile. To this extent, gestures are pragmatic elements since they form part of the contextual environment of the words in a conversation.

However, at another level, these gestures have schematic patterns of usage; for example, a wink typically indicates deception. For this reason, gestures have many of the elements of semantics, and can be seen as entrenched meaning bearing elements (in the sense of Langacker (1987)). For these reasons, the study of the prototypical patterns of gesture use can give us an idea as to how semantics and pragmatics interact in discourse.

This paper is a study of the Bengali speech-gesture “Acha” as spoken by Bengali speakers in natural settings, including participant observation in the field and recorded interviews. We argue that a study of “Acha” gives us important insights into the interface between Bengali semantics and Bengali pragmatics. In particular, by exploring the perlocutionary schema underlying the use of “Acha” we find that the generalization commitment (Lakoff, 1990) can be extended to perlocutionary acts. Our study shows that the same patterns of meaning observable in the semantics of concepts are also observable in perlocutionary acts. Further, the speech-gesture “Acha” serves as the glue between semantics and pragmatics. We tentatively hypothesize that gestures are to perlocutionary acts what image schema are to concepts. We conclude that methods of cognitive linguistics can influence research in the pragmatics of spoken language via the study of gesture.

References

- Austin, J.L. (1962). *How to do things with words*. London: Oxford University Press
- Kita, S. (2000). How representational gestures help speaking. In D. McNeill (Ed.), *Language and Gesture* (pp. 162–185). New York: Cambridge University Press.
- Lakoff, G. (1990). The invariance hypothesis: Is abstract reason based on image schemas? *Cognitive Linguistics*, 1(1), 39–74.
- Langacker, Ronald W. (1987). *Foundations of Cognitive Grammar, vol. 1: Theoretical Prerequisites*. Stanford: Stanford University Press.
- Langacker, Ronald W. (2008). *Cognitive grammar: A Basic Introduction*. New York: Oxford University Press.
- Enfield, N.J. (2009). *Anatomy of meaning: Speech, Gesture and Composite Utterances*. New York: Cambridge University Press.

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What can co-speech gestures in Aphasia tell us about the relationship between language and gesture?

Background: There is a limited body of research which has investigated the gestures produced by people with aphasia alongside narratives. There is some research on the frequency of gestures produced and also gestures produced without speech as alternative to verbal language. Analysis of the co-speech iconic gestures used by people with communication impairments, such as aphasia, has the potential to add crucial evidence to the picture emerging from cross-linguistic and developmental studies (e.g. Kita & Özyürek, 2003; Kita et al., 2007). Such studies have converged on the idea that language and gesture are either part of the same system (e.g. McNeill, 2000) or two highly integrated systems (e.g. Kita & Özyürek, 2003), raising the possibility that impairment to the communication system might also implicate co-speech gesture.

Aim: The aim of this study was to determine whether the co-speech gestures produced by three participants with aphasia were a) similar to the data reported in the published literature; and b) reflective of the co-occurring language production difficulty.

Methods and Procedures: To do this we analysed the co-speech iconic gestures produced by three participants with aphasia during the retelling of two key events from the 'Canary Row' Sylvester and Tweety cartoon: 'swing' and 'roll'. We compared these with data from the same two events in the published cross-linguistic literature.

Outcomes and Results: The findings revealed that none of the three participants with aphasia produce the typologically preferred language to describe these key events (i.e. using the verb labels 'swing' and 'roll' in a single clause construction). Furthermore all participants with aphasia used the semantically-light verb 'go' to describe one of the key manner-of-motion events (in two cases this was 'swing' and in one 'roll'). All occurrences of 'go' were accompanied by path only co-speech gestures. There was no evidence of the co-speech gestures conflating manner and path that have been consistently reported in the literature for English speakers with unimpaired language. In addition there were a number of gestures depicting manner in isolation (sometimes followed by separately gestured path), a pattern which has not been reported in the literature for English speakers. If events other than these two key ones are also considered, there is evidence that these three participants also produced the expected conflated gestures; but they did not do so for 'swing' and 'roll'.

Conclusions: Overall these findings support the prevailing theory that language and gesture are part of either the same system or two highly integrated systems.

References

- Kita, S., & Özyürek, A. (2003). What does cross-linguistic variation in semantic co-ordination of speech and gesture reveal? Evidence of an interface representation of spatial thinking and speaking. *Journal of Memory and Language*, 48, 16–32.
- Kita S., Özyürek, A., Allen, S., Brown, A., Furman, R., & Ishizuka, T. (2007). Relations between syntactic encoding and co-speech gestures: Implications for a model of speech and gesture production. *Language and Cognitive Processes*. vol. 22, number 8, 1212–1236.
- McNeill, D. (2000). *Language and Gesture*. Cambridge: Cambridge University Press

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Cognitive strategies, gestures and sign language: Examples from lexical iconicity

To find out the exact distribution of iconic parameters and their types/functions in lexical iconicity

Linguistic analysis of the signs of a sign bilingual wordlist (West Hungarian and Austrian Sign Language: <http://www.tothantal.hu/omaa/>).

Iconicity is the result of a system of coding strategies which are applied in correspondence to certain cognitive strategies and which preserve some properties or structures of the referents. Coding of concepts (especially of lexically represented ones, except onomatopoeia) or events shows a rather low or abstract use of iconicity in spoken languages, though sometimes underestimated (cf. Dotter 1995). In contrast, lexical iconicity in sign languages is frequent, though its functions in language learning and competence are partially doubtful (cf. Wilcox & Morford 2006: 175–179). Taub (2001) showed that double mapping using different iconic strategies within one sign is common. From the perspective of embodiment or conceptual metaphor, even different single sign parameters may represent different metaphors within one sign.

The findings quoted can be confirmed. E.g. we can see two steps in some codings:

1. A strategy comparable to the part-for-the-whole metonymy in selecting a part of a (perceivable) activity for representing the whole activity (e.g. hand-waving for farewell)
2. A non-metaphoric strategy of iconic coding of this selected part (e.g. hand-waving represents hand-waving)

Also two metaphors can be applied in combination:

1. A conceptual metaphor (e.g. 'end' for 'farewell')
2. A visual metaphor to represent the conceptual one (e.g. 'end' via blocking the movement of the dominant hand by the non-dominant one)

The 'extreme' form of non-metaphoric iconic representation via an image is performing the selected part of an activity by hand as it is done in reality (when the hand represents itself); most forms are somehow abstracted, however. This strategy of (partially) abstracted representations of form/activity is one of iconic image; we sometimes can find 'borrowings'/'transfers' out of the set of gestures used by the hearing culture (cf. e.g. items on negation or evaluation). Partially, these borrowings can themselves be seen as realizations of conceptual metaphors.

The border between non-metaphoric abstracted form/image representation and diagrammatic iconic representation (e.g. for 'house') cannot be strictly drawn (which conforms with Peirce's insight that signs may contain several types of iconicity to different degrees). The cognitive strategies applied compare to general visual strategies we can find in painting or the development of some letters, etc. (cf. also Cuxac & Sallandre's (2007) hypothesis that many signs of sign language developed from highly iconic elements towards more simple—but often preserving some iconicity—signs).

Other coding strategies found are deictic (e.g. showing an object) or deictic-metaphoric (e.g. showing the prototypical place or course of an object), or use transferred/secondary forms (e.g. the form of a geographical unit on a map). Concerning single parameters, e.g. handshape can be used for form/activity iconicity as well as for metaphors (e.g. evaluation).

A matrix of parameters and their iconic functions will be presented.

References

- Cuxac, Christian & Sallandre, Marie-Anne (2007): Iconicity and arbitrariness in French Sign Language: Highly iconic structures, degenerated iconicity and diagrammatic iconicity. In: Pizzutto, Elene & Petrandrea, Paola &

- Simone, Raffaele (eds.): *Verbal and signed languages*. Berlin, New York: Mouton de Gruyter, 13–33
- Dotter, Franz (1995): Nonarbitrariness and iconicity: coding possibilities. In: Landsberg, Marge E. (ed.): *Syntactic iconicity and freezes*. Berlin/New York: Mouton de Gruyter, pp. 47–55
- Taub, Sarah F. (2001): *Language from the body: iconicity and metaphor in American Sign Language*. Cambridge: Cambridge Univ. Press

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Discourse levels in narration and cinema, American versus Mexican culture

Observing cultural distinctions in oral narrations may be helpful in the study of inter- and intra-cultural communications. Cultural divergences in responses to cinematic media may affect the selection of narrative elements and nonverbal behaviors. We report a study of original narrations of a film story (The Pear Film, Chafe 1980). Of particular interest are culturally bound aspects of interaction and narration that may help create a sense of interpersonal rapport. Our corpus of narrative discourses consisted of Mexican Spanish- and American English-speaking, female/male dyads. The females were assigned the role of Speaker. They watched the Pear Film and then recounted the story of it to the male Listener in as much detail as possible. Eight dyads were selected from a larger body of twenty-seven Mexican and thirty American dyadic narrations. First, we parsed the Pear Film itself, shot-by-shot, into cinematographic levels of analysis analogous to the scheme for analyzing levels of discourse: narrative, metanarrative, and paranarrative. The film comprises 43 shots. We determined shot length, shot type, and shot angle to establish character groupings, character and film-viewer perspectives, and potential cinematographic techniques designed to elicit certain reactions, perspectives, or sympathies from the viewer. Three scenes were then selected for analysis at the discursive level. We analyzed the intervals of spoken discourse corresponding to each of these scenes and all gestures that accompanied these intervals of speaking. We found that our Mexican and American Speakers' narrative discourses varied in several ways. For instance, scene descriptions in the Americans' narrations averaged 10.5 seconds, while in the Mexicans' averaged 8.0 seconds. The Americans were more loquacious. They elaborated more on narrative details. The Mexicans were more concise. We discuss further, prominent dimension of variation in terms of the construct narreme. A narreme is the most fundamental element of a narrative. Culture-influenced narreme selection was the clearest differentiation. The four American Speakers were four times as likely to produce narremes expressive of meta-narrative content than were the four Mexican Speakers. The Mexican Speakers were much more likely to produce paranarrative narremes. Consistent with these differences in spoken discourse, we observe differences in the content of speech-co-produced gestures; notably, the abundant, meta-level discourse of the Americans is particularly rich in expressions of cinematographic notions (e.g., long-shot, pan, shot frame) and their gestures manifest corresponding perspectives and frames. We will argue that such speech-and-gesture reflected perspectives and frames fundamentally shape culturally-distinctive narrative discourse. These data and our analysis suggest that there is a direct relationship between multimodal communication and discursive elements of narration in cinema (i.e. film language). We will discuss how this kind of study may lead to an understanding of the nature of semiotic devices that exist within cultures.

References

- Adorno, Theodor W. [1991]. *The Culture Industry*. London: Routledge.
- Wallace Chafe (ed.) (1980). *The Pear Stories: Cognitive, Cultural, and Linguistic Aspects of Narrative Production*. Norwood, New Jersey: Ablex.
- Eco, Umberto. (1976) *A Theory of Semiotics*. Bloomington, IN: Indiana University Press.
- Metz, Christian, Michael Taylor, trans. (1991) *Film Language*. Chicago: The University of Chicago Press.
- Tsivian, Y. (2006). Cinematics (version 1.0) [software]. Available from <<http://www.cinematics.lv/>>

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Gestures in photographs

This paper argues that manual gestures made in photographs enable a form of mediated interaction between the subjects of photographs and the subsequent viewers. The practice of still photography—both amateur and professional—is a pervasive social practice across developed and developing nations. Still cameras – including cameras integrated into devices such as mobile telephones and laptops—are near-ubiquitous, and online photo-sharing services are increasingly popular (Gye 2007, Miller & Edwards 2007). This paper interrogates the gestural practices of the photographic subject, and argues for an understanding of gestures-in-photography that is distinct from, and yet closely related to, gestures made in social (speaking) situations.

For the purposes of this paper, the term gesture is used predominantly to refer to ‘manual gesture’; actions performed using the hands and arms, including hand-shapes and arm movements. Gesture is further understood, following the well-established literature of gesture studies, to be part of language, used by people both with and without speech to achieve meaning in social interactions. Manual gesture can be classified, following McNeill (cf. 1992), according to its relationship to co-occurring speech and the ways in which the gestures form meaning.

This study examines the manual gestures performed by people as they are being photographed; in short, the gestures that the photograph captures. This study focuses on the ‘peace sign’ gesture, in which the index and middle fingers of either hand are extended upwards in a V, with the remaining fingers and thumb folded across the palm and the hand held with the palm towards the viewer. This gesture is selected as it has clear directionality (i.e. that the palm is oriented towards the viewer) and is easily distinguishable as an intentional hand-shape formed by the photographic subject. The corpus of photographs used in this study were sourced from Creative Commons licensed content made publicly available by the creators.

Manual gestures are performed as part of a practice of ‘photographic posing’, embedded within particular social and cultural contexts and part of the (re)production of that culture (Larsen 2005, van Dijk 2008). Critically, this study argues that manual gestures function as part of the construction of a mediated interaction between the photographic subject, conceptualised as the speaker/gesturer, the photographer and the audience, conceptualised as the listener/viewer. This paper argues that the manual gestures made by photographic subjects are deployed not only as part of the reproduction and performativity of cultural norms and expectations of visual representation, but also as part of a shared gestural communicative repertoire. Through the performance of particular gestures, the photographic subject encodes and constructs meaning dialogically between him/her-self and the viewer. Gestural practices in photography are therefore argued to be both part of the performativity of photography / images (Bakewell 1998), and engagement in a mediated interaction between the subject and the viewer.

References

- Bakewell, L. (1998). ‘Image acts’ *American Anthropologist* 100(1): 22–32.
Gye, L. (2007). ‘Picture This: The impact of mobile camera phones on personal photographic practices’ *Continuum* 21(2): 279–288.
Larsen, J. (2005). ‘Families seen sightseeing: Performativity of tourist photography’ *Space and Culture* 8: 416–434.
McNeill, D. (1992). *Hand and mind*. Chicago: The University of Chicago Press.
Miller, A. D. & Edwards, W. K. (2007). ‘Give and take: A study of consumer photo-sharing culture and practice’ *CHI 2007 Proceedings*: 347–346.
van Dijk, J. (2008). ‘Digital photography: Communication, identity, memory’ *Visual Communication* 7(1): 57–76.

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Sensitivity to temporal asynchronies for cospeech gestures and for ASL-English code-blends

People are very sensitive to asynchronies between auditory and visual events, such as when the sound is out of sync with the picture on television. For both speech and non-speech events (e.g., a hammer hitting a peg), audio-visual asynchronies are more easily detected when the visual event follows, rather than precedes the audio event (Dixon & Spitz, 1980). Co-speech gestures tend to slightly precede, but rarely lag behind the associated spoken word (Morrel-Samuels & Krauss, 1992). Similarly, when bilinguals fluent in American Sign Language (ASL) and English produce a sign while speaking (a code-blend), the sign is produced simultaneously with or slightly before the spoken word (Emmorey et al., 2008). Thus, for both co-speech gesture and code-blends, the visual event tends to slightly precede and rarely follows the associated audio event.

We investigated whether sensitivity to asynchrony in co-speech gesture and code-blends is the same as that for other linked audio/visual events. ASL-English bilinguals (N=32) and monolingual English speakers (N=30) were presented with video clips of a) English speakers gesturing while talking and b) ASL-English bilinguals producing code-blends. The video clips were from conversations and re-tellings of the Canary Row cartoon. The face and mouth were obscured to prevent participants from relying on the asynchrony between lip movements and the audio track. Video clips were created with video offsets of 3, 6, 9, 12, or 15 frames, both leading the audio (Hands Lead) and lagging the audio (Hands Lag) (range: +/- 100–500ms). Participants watched both a Forward block of video clips starting with the audio and video in sync, responding when they felt that the clip was asynchronous, and a Backward block starting with audio and video out of sync, responding when they felt the audio and video were synced. Participants’ offset detection times are averaged separately for the Forward and Backwards blocks to obtain a threshold for each, and these thresholds were then averaged to obtain a Hands Lead and a Hands Lag threshold.

ASL-English bilinguals were very sensitive to temporal asynchronies within code-blends, and the audio-visual asynchrony was more easily detected when the sign followed, rather than preceded the spoken word (mean Hands Lag threshold=187ms; mean Hands Lead threshold=327ms). This pattern mirrors what has been found for coupled non-linguistic audio-visual events. In contrast, for co-speech gesture, data from both groups revealed a much weaker pattern, with only a small difference between when gestures followed vs. preceded the speech (bilinguals: Hands Lag mean=254ms; Hands Lead mean=284ms; monolinguals: Hands Lag mean=245ms, Hands Lead mean=283ms). ASL-English bilinguals and monolinguals did not differ in their sensitivity to co-speech gesture asynchronies.

These results suggest that the signs and speech in code-blends are tightly linked, while gesture and speech operate more independently. Because gestures are often associated with a phrase rather than with a single word, sensitivity to temporal asynchrony may be less than that for code-blends, which link single signs and individual English words.

References

- Dixon, N.F., & Spitz, L. (1980). The detection of auditory visual desynchrony, *Perception*, 9(6), 719–721.
Emmorey, K., Borinstein, H.B., Thompson, R., & Gollan, T.H. (2008). Bimodal bilingualism. *Bilingualism: Language and Cognition*, 11(1), 43–61.
Morrel-Samuels, P., Krauss, R.M. (1992). Word familiarity predicts temporal asynchrony of hand gestures and speech. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 18(3), 615–622

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The interactive coordination of the non-next-speaking hearer's eye gaze shifts in Japanese three-party conversation

In this presentation, we demonstrate that a non-next-speaking hearer (NNSH), who doesn't take a next turn in a multi-party conversation, actually engages in turn-taking by means of eye-gaze shifting.

Kendon (1967) shows that a speaker looks at a hearer to yield his/her turn and a next-speaking hearer looks at the speaker at the end of the current turn. Goodwin (1980) observes that a speaker tries to attract attention from a hearer by restarting his/her turn beginning and/or taking a pause when the hearer doesn't look at him/her at the turn beginning. These observations mean that a current speaker and a next-speaking hearer establish mutual gaze at the moment when they change turns.

Meanwhile, in a multi-party conversation, what is a NNSH doing at that moment? We have long studied the hearers' non-verbal behaviors in Japanese three-party conversations (Den & Enomoto 2007). The most striking finding in our studies was that a NNSH often shifted his/her eye-gaze direction toward the next speaker at the end of the current turn, especially at the beginning of its utterance-final elements (UFEs).

As shown by Tanaka (1990), UFEs in a turn project its possible completion point, which projection enables a next speaker to take the next turn as soon as the current turn finishes. We experimentally examined that Japanese listeners can precisely respond to utterances ended with UFEs, such as an auxiliary verb and a final particle, in 62.87 msec on average after utterance completion (Enomoto 2007).

Now we'll show that the timing of NNSH's eye-gaze shifting is also extremely precise. In significant number of cases, his/her eye-gaze shifting is operated by the mechanism common to the next speaker's turn initiation. That is to say, NNSHs also use the resource of the UFEs and shift their eye-directions from a current speaker to the next one to fit the next turn beginning.

12 sessions of Japanese three-party conversations were used for this analysis. We labeled (1) each of a point when NNSH's eye-gaze shift started from a current speaker to the next, and (2) each point when the NNSH's eye-gaze shift finished around the turn completion with UFEs. Figure 1 depicts the frequency histogram of the duration from a beginning point of the UFEs to a starting point of eye-gaze shift. This histogram shows that almost all of the eye-gaze shifts are started after UFEs begin, which result suggests that a NNSH gradually starts his/her eye-gaze shift after recognizing the UFEs. On the other hand, Figure 2 depicts the frequency histogram of the duration from the ending point of the eye-gaze shift to the beginning of a next turn. Clearly, this distribution has a polar between -0.1 sec and 0 sec, which shows that the final timing of eye-gaze shifting is adjusted to fit the next turn beginnings.

We thus conclude that the engagement of a NNSH in Japanese three-party conversations is established by coordinating his/her eye-gaze behavior with turn-taking process performed by current and next speakers.

References

- Den, Y. and Enomoto, M. (2007). A scientific approach to conversational informatics: Description, analysis, and modeling of human conversation. T. Nishida (Ed.). *Conversational informatics: An engineering approach*, pp. 307–330. John Wiley & Sons Inc.
- Goodwin, C. (1980). Restarts, pauses and achievement of a state of mutual gaze at turn beginnings. *Sociological Inquiry*, 3–4, 272–302.
- Kendon, A. (1967). Some functions of gaze direction in social interaction. *Acta Psychologica*, 26, 22–63.
- Tanaka, H. (1999). *Turn-Taking in Japanese Conversation: A Study in Grammar and Interaction*, Pragmatics & Beyond, New Series, Amsterdam: John Benjamins

Figure 1

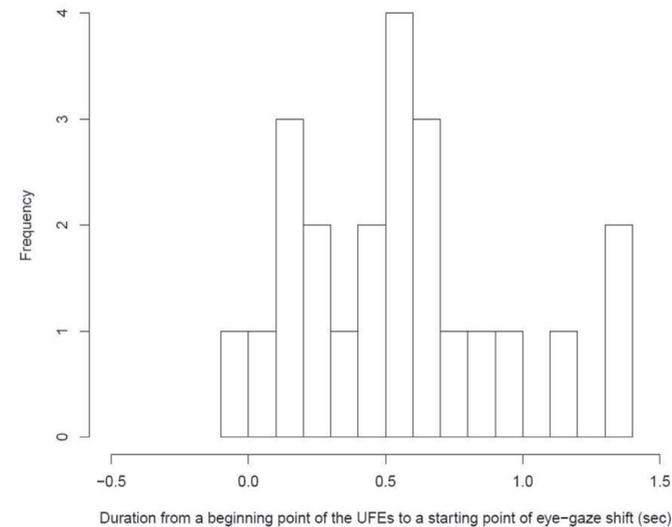
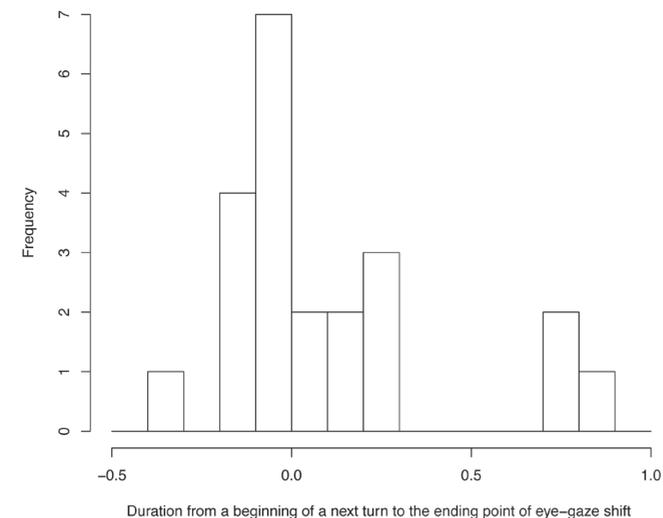


Figure 2



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Stancetaking in gestures: The emergence of evaluations in spatial relations

The domain of space has proven to be a powerful cognitive tool in representing relations within other domains like power, time and emotions, as well as in attributing positive and negative value to the objects in question. For example, people commonly use the image schemas of UP/DOWN and RIGHT/LEFT to reason and talk about something construed as POSITIVE/NEGATIVE. But what can be said about when the speakers themselves are not only a term of these relationships, but also the evaluators of the orientation of the object of stance (Du Bois 2007)? In view of the fact that stance can be expressed even without linguistic representation (Bühler 1934), this paper presents the results of a pilot study focused on how people express their stance, that is, their relationship with subjectively positive and negative objects and concepts, and how this is evidenced in natural media such as gesture.

When speakers exhibit judgment values like positive and negative, or ‘evaluations’ (Du Bois 2007), they provide personal contextualization with respect to their sociocultural background, whether it is done intentionally or not. There is evidence of differences in speakers’ stances expressed in co-verbal gestures: for example, a Christian will use an inverted gestural system with respect to a Satanist’s when talking “objectively” about God and Satan (Evola 2010). However, judgment value polarity can be expressed not only by the UP/DOWN and LEFT/RIGHT metaphors, but also via a third, more complex and comprehensive metaphor regarding spatial localization: CENTER/PERIPHERY.

This paper argues an alternative system of gestural stancetaking where the Ego (or speaker) is the Origo of the spatial scene (Bühler 1934), in which (metaphorical) objects are placed and displaced more or less peripherally. This CENTER/PERIPHERY metaphor is dynamically created by gesturing an ego-originating vector path, giving rise to the metaphors ACCEPTANCE IS CENTRIFUGAL and REJECTION IS CENTRIPETAL, which are motivated experientially: as infants, humans push away and throw food they dislike, while indicating things they like or want possessively by bringing them closer and clenching to them (Carter 1975).

Center is construed as stability, as the default and/or as positive, whereas laterality and periphery is often perceived negatively and as inessential (Sweetser 2004). Even so, evaluations are not always indicated simply by two extremities of a pole (positive vs. negative), but may also be scalar. The underlying hypothesis of this study is that in a communicative process, the stance of the speaker-gesturer may be assessed on the basis of considering the gesture motions as vectors. In this sense various formal elements of the gesture phase need to be described and analyzed, including the speed and the distance covered by the gesture. For this reason, this study uses data recorded by a motion capture system of speakers evaluating various objects and compares it with data collected from a radial categorization task.

References

- Bühler, K. (1934). *Sprachtheorie*. Jena: Fischer.
- Carter, A.L. (1975). The transformation of sensorimotor morphemes into words: a case study of the development of ‘more’ and ‘mine’. *Journal of Child Language*, 2(02), 233–250.
- Du Bois, J.W. (2007). The stance triangle. In *Stancetaking in discourse: Subjectivity, evaluation, interaction*, ed. Robert Englebretson. Amsterdam: Benjamins.
- Evola, V. (2010). Metafore, Sistemi Religiosi e Semiotica Cognitiva Multimodale. *Discorsi, Gestualità e Disegni di Predicatori di Strada Cristiani e di un Satanista. Sistemi Intelligenti. Scienze Cognitive e Intelligenza Artificiale*. 1/2010. Bologna: Il Mulino.
- Sweetser, E.E. (2004). “The suburbs of your good pleasure”: Cognition, culture and the bases of metaphoric structure. In G. Bradshaw, T. Bishop and M. Turner (eds.), *The Shakespearean International Yearbook*, vol. 4: *Shakespeare studies today*. Aldershot, England: Ashgate Publishing. 24–55.

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Gestures and persuasion in ancient Greece and Rome

Cicero refers to gestures as ...*corporis quaedam eloquentia* (a sort of eloquence of the body). Both he and, later on, Quintilian give very detailed and complex instructions about how an orator has to make use of gestures while publicly speaking. Many Greek orators, instead, strongly supported abstention from moving their hands, even by keeping their arms concealed within their cloak, as Hyperides points out in one of his speeches. This is supposed to be a sign of sophrosyne “wisdom, common sense”. Cicero’s *Orator* and *De Oratore*, as well as Quintilian’s *Institutiones Oratoriae* are real treatises on the use of gestures and postures for the perfect orator. The way of presenting their speeches, *actio*, is distinguished in *vox* (voice) and *motus* (motion), which is in turns divided into *gestus* and *vultus* (face). *Gestus* includes, in addition to what we call now “gesture”, also posture and displacement during the speech. In giving instructions to public speakers both treatises provide a detailed classification of both *gestus* and facial expressions divided according to the part of the body involved and the communicative functions each movement plays.

The communicative model underlying this classification (that will be described in detail) is the activation in the hearer of emotional reactions (*adfectus*) by exciting his attitudes as chords in a zither (*ut nervi in fidibus*). In fact *omnis ... motus animi suum quemdam a natura habet vultum et sonum et gestum* (every affect has by nature its own face, voice, and gesture). Thus, gestures, as well as faces, body postures, or scenic movements, have the function of playing the right (emotional) chords by penetrating through eyes. This idea seems to rely on the precise perceptual model of the Stoic philosophy, according to which both emotions and knowledge come from a process of alignment of the subject with the external world, through senses.

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Metaphorical gestures in classroom interaction

This study focus on metaphorical gestures employed by a teacher during classroom interaction. We aim at analysing how the teacher's metaphorical gestures relate to embodied meaning (Gibbs, 2006). Studying gestures as they are integrated with speech provides insights on whether metaphoricity is active at a given moment during speaking or not. We believe that gesture and language cannot be treated separately. We apply a qualitative methodology, which combines linguistic, interaction, and gesture approaches (Müller, 2008). The examples discussed here were taken from the same set of data: A DVD where a school teacher in a programme for promoting adult literacy among the poor population of Fortaleza, a capital city in the Brazilian Northeast, introduces a new unit in the Portuguese language class which topic is "Life in the city". She explains the activities students are expected to carry out and goes on comparing life in the city and life in the country. The teacher explains the changes in Brazilian society across time. Before workers from the Northeast needed to move to the rich South looking for work, nowadays the situation has changed. There is industry in the state. A verbo-gestural metaphor appears when she tells students that there are two industrial poles in that state. The teacher employs a metaphor of change (McNeill, 1992). She lifts her arms wide open and with hands up, palms down, she slowly moves hands down in a rotation movement in order to represent how the industry is divided between the north-west and the south part of that state. In order to support the argument that it is over with the idea that there is only life in the city of Fortaleza, she moves her right hand back and forward gazing at her interlocutors, that is the students, and use a deitic hand movement pointing at her breast in order to say that she is also the result (in Brazilian Portuguese there is the metaphorical expression 'to be the fruit of') of this idea, since she was born in Rio de Janeiro due to the fact that her parents moved there in search for better job opportunities. The teacher tells students that she had experienced this movement throughout her life. In fact, she says "my whole life passed like this. She then tells that many family members had worked as waiters in Rio. In the third verbo-gestural metaphor used, the teacher points both hands forming a cup to herself and then stretches both hands to the left in a conduit gesture. Her gesture refers to the source domain of MOVING OBJECT (Grady, 1997). In that case metaphoricity is activated because the verbal metaphor is accompanied by a gesture drawing upon the same source domain. The data point out that embodied meaning motivates the metaphorical gestures employed by the teacher in classroom interaction. Our findings reveal how the use of verbo-gestural metaphors reinforce interaction in the language classroom.

References

- Gibbs Jr, R. (2006) *Embodiment and Cognitive Science*. Cambridge: Cambridge University Press.
McNeill, D. (1992) *Hand and mind: What gestures reveal about thought*. Chicago: University of Chicago Press.
Müller, C. (2008) What gestures reveal about the nature of metaphor. In Cienki, A, Müller, C. (eds.) *Metaphor and Gesture*. Amsterdam: John Benjamins.

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Constructed action and enactment in explanations of meaning (German Sign Language and German)

Constructed action is a construction using blended mental spaces and which is commonly found in sign languages. It has been described mainly in narrations although there is increasing evidence that it is not narration specific but a general device for predication.

Based on a corpus of elicited explanations of meaning (definitions) in German Sign Language (GSL) we will make clear that constructed action is indeed not narration specific. In addition the data elicited for one and the same item prove that the use of constructed action varies with different conceptualizations of the action that the target item refers to.

In a second step the GSL definitions are contrasted with definitions in German of two kinds, lexicographic and oral. The latter ones were elicited according to the same procedure as the GSL data and show enactment.

The German data necessitates a sociolinguistic differentiation. Against this background we examine the question whether or not constructed action in GSL and enactment in spoken German are the same phenomenon while paying particular attention to features which allow for a clear distinction.

References

- Cuxac, Christian & Sallandre, Marie-Anne (2007): Iconicity and arbitrariness in French Sign Language: Highly iconic structures, degenerated iconicity and diagrammatic iconicity, in: Pizzuto, Pietrandrea, Simone: *Verbal and signed languages: comparing structures, constructs and methodologies*. Berlin, 13–33
Dudis, Paul (2002): Grounded blend maintenance as a discourse strategy, in: Lucas, C. (ed.): *Turn-taking, finger-spelling, and contact*. Washington, DC, 53–72
Fischer, Renate & Kollien, Simon (2009): Constructed Action und Mundgestik in DGS: Lautmalerei und synästhetische Symbolisierungsverfahren, in: *Das Zeichen* 83, 464–478
Goodwin, Charles (2000): Action and embodiment within situated human interaction, in: *Journal of Pragmatics* 32, 1489–1522
McClave, Evelyn (2001): The relationship between spontaneous gestures of the hearing and American Sign Language, in: *Gesture* 1.1, 51–72
Quintos-Pozos, David (2007): Can constructed action be considered obligatory?, in: *Lingua* 117:7, 1285–1314

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The use of manual gestures in the signing process of Israeli Sign Language

This paper deals with the manual gestures used by signers during conversation as a means to reflect global thinking. Much of the literature concentrates on the use of both corporal and vocal gestures in the conversations of the hearing population as a means to reflect and emphasize global and iconic features that cannot be encoded in the flow of spoken language. Contrary to spoken language, research in the use of gestures in the signing process of signed language is still in its infancy. Recent research has focused on the facial expressions and oral gestures used by Israeli signers in the process of signing. These studies report that the iconic oral gestures that appear in the signing process complement the message being transferred in a way similar to the use of manual gestures in the speech of the hearing population. Less attention has been paid to the questions: Do signers use manual gestures during the signing process in the same way that the hearing population tends to exploit vocal gestures in spoken language, and if so, what kinds of manual gestures do signers use in order to transfer a message in context. In order to respond to these questions, a qualitative structural analysis was performed on the utterances of deaf Israeli signers describing an event that transpired in a narrative and in free conversation. An analysis of these utterances reveals that the use of gestures by signers is not limited to the areas of the mouth and the face. The Israeli signers in our study used manual and corporal gestures as well in the signing process. Three gestural-phonological strategies were used by the Israeli signers in order to represent iconic-global features: (1) lengthening the trajectory of movement of the articulator in space (generally to emphasize quantity/proportion); (2) altering the area of the extension of the fingers (generally to emphasize degree or size); (3) restrain or acceleration the movement of the articulator (generally to represent the continuation or the coordinated speed of an action). It is interesting to note that some of the manual gestures used by Israeli signers (i) shared the same motivations found in the prosodic vocal gestures of the hearing population, and (ii) were even found to be similar in their structure. At the same time, our research revealed that Israeli signers also used additional manual gestural-phonological means to transfer iconic messages in context that are not able to be produced vocally. These gestural-phonological means include: (a) the use of 'allophonic-signs'; (b) the manipulation of the disfavored hand used for signing; and (c) a creative change in the structure of the sign in order to give the sign a new context-specific meaning. All of these manual gestural-phonological means used by Israeli signers to transfer and emphasize iconic global messages indicate that the exploitation of gestures is neither unique nor inherent to spoken language but is rather a complementary feature of language in general.

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Language-specificity and interplay of action, gesture, and speech in early language development of caused motion

What are the early links between gesture and language development? This question has been mostly investigated in early spontaneous speech of English- and Italian-speaking children (e.g., Iverson, et al, 2008). However the possible effect of typology of language in early interplay between gesture, speech and even possibly action has not been investigated. We explore this early multi-modal interplay in Turkish-speaking children.

Caused motion events (e.g. the girl pushed the basket into the room) are basic events where an Agent (the girl) performs an Action (push) that causes a Figure (basket) to move in a spatial Relation (into) to a Goal (the room). However, languages lexicalize these semantic elements differently (Talmy, 2000). Verb-framed languages encode Relation in the verb (e.g., Turkish: arabayı (car) garaja (garage) soktu (put-in)- '(he) put the car into the garage'), whereas satellite-framed languages (e.g., English) use a non-verbal element (i.e. a satellite such as "into"). Previous research shows that children learn these language-specific patterns early. Thus, it is plausible that Turkish-speaking children early on learn to encode Relation together with Action in the verb. In addition, given the argument omission possibilities in Turkish, Action-Relation verbs could be one of the first words children produce. Here, we examine whether learning verbs encoding Action and Relation early on could facilitate early production of co-speech gestures and even co-speech actions, possibly to supplement the arguments of these verbs omitted in speech.

We sampled the spontaneous speech (981 utterances) and co-speech gestures (238) and actions (30) that expressed caused motion from seven Turkish-speaking children every three months between 12 and 36 months. Children, as expected, started talking about caused motion events using verb-only constructions (e.g. koydum '(I) put') at 14 months and after 17 months used verb-plus-argument constructions (e.g. bunu tak 'attach this one'). A considerable amount of omissions remained till 36 months. Children used specific verbs to conflate Action and Relation as frequently as general verbs encoding only Action, showing language-specificity from the outset.

Deictic (holding up an object for demonstration/pointing at a referent) and iconic gestures as well as manipulative actions accompanying caused motion speech appeared around 19 months. Children gestured (both deictic, iconic) and performed manipulative actions more with age. The semantic elements encoded differed according to gesture vs. action and the gesture types (hold-ups: Figure; points Figure/Goal; iconics: Action/Relation; manipulative actions: Action/Figure/Relation).

Both actions and gestures were used to encode elements not conveyed in speech (i.e. to supplement- Özçaliskan & Goldin-Meadow, 2005), more frequently in the earlier stages of development -although a considerable proportion still supplemented speech till 36 months.

Our findings on development of a typologically different language (i.e. Turkish) show that slightly after learning the first verbs that encode Action and/or Relation (around 19 months), children use co-speech gestures and even co-speech actions- which encode different semantic elements- to supplement the information in speech. Thus we argue that the interplay between action, gesture and speech might be influenced by the specific language children learn.

References

- Iverson, J., Capirci, O., Volterra V., & Goldin-Meadow, S. (2008). Learning to talk in a gesture-rich world: Early communication in Italian vs. American children. *First Language*, 28, 164–181.
- Özçaliskan, S. & Goldin-Meadow, S. (2005). Gesture is at the cutting edge of language development. *Cognition*, 96, 101–113.
- Talmy, L. (2000). *Toward a cognitive semantics: Vol. II: Typology and process in concept structuring*. Cambridge, MA: MIT Press.

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The impact of listener location on how speech and gesture are coordinated as the speaker describes motion events: A case of Japanese cartoon narrative

The present paper reports on a study that examined whether location of listener has any impact on how speech and gesture are coordinated in Japanese speaker retelling a cartoon story. We are not the first to address this question. Özyürek (2002) pioneered this line of research, reporting that native speakers of American English change gestures when the location of listeners relative to the speaker is experimentally manipulated. What Özyürek did was this: In one experiment, one listener was seated right in front of the speaker, and in the other experiment two listeners were seated in front of the speaker. These experimental conditions were each compared with control conditions where only one listener was seated either on the right hand side or left hand side of the speaker. The speakers preferred “sagittal” axes to “lateral” ones to gesturally depict motion of a cartoon character moving INTO and OUT OF a building when they had one listener right in front or two listeners than when they had only one listener to the side (either to their right or left). The effect was not confirmed when the speaker described motion ACROSS; it did not depend on the number of listeners, but on their position relative to the speaker. Given all this, Özyürek argued, it is the intersection of the social spaces created by the location of listener(s) and the speaker that influences speakers’ construal of shared space. Meanwhile, when there was only one listener, whether the listener is to the right or to the left of the speaker did not influence on the speaker’s preference of the axes to gesturally express motion INTO and OUT OF. The only difference was, the range of the speaker lateral gestures was skewed slightly to the left when the listener was seated to the speaker’s left than when the listener was seated to the speaker’s right. One may naturally wonder whether these effects hold for speakers of other languages (especially ones typologically different from English). We thus replicated (as much as possible) Özyürek’s study using the same cartoon (dubbed in Japanese) to induce narrative from native speakers of Japanese. We are currently in the process of analyzing the data and what we can say at this moment is not conclusive, but to anticipate the conclusion, the results seem to be different from the Özyürek study, suggesting linguistic and/or cultural relativity. We will report results of data analyses and discuss their implications in our presentation.

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Spontaneous co-verbal gestures in simultaneous interpreting from English into Portuguese: Notes from an experiment

Gesturing has an important communicative function, as it helps listeners/viewers understand speakers/gesturers, but it also plays a fundamental role for the gesturers themselves by helping them in various ways, such as relieving their cognitive effort, aiding in the organization of spatial information or in the retrieval of lexical items (Goldin-Meadow 2003:145-166). While several studies have focussed on the function of gestures and their relation to speech in face-to-face interaction, little research has been done on this relation in a particularly complex communication situation: simultaneous interpreting (Zagar Galvão 2009: 6-8; Rodrigues 2007). Simultaneous interpreting (SI) is a specific form of speech and can be defined as “spoken-language interpreting with the use of simultaneous interpreting equipment in a sound-proof booth” (Pöchhacker 2004:19). Though simultaneous interpreters cannot usually be seen by their interlocutors (the audience), whom they can reach only through their voices, they still use spontaneous co-verbal gestures in the booth (Rodrigues and Zagar Galvão, forthcoming). The objective of this paper is to test whether speech content influences interpreters’ gesticulation (Kendon 2004:104) and, more specifically, whether speeches containing descriptions of particularly complex processes may influence the type and frequency of interpreters’ gestures in the booth.

Four professional interpreters interpreting simultaneously from English into Portuguese were filmed in an experimental setting and their gestures analysed. The analysis was partly quantitative, concentrating on the interpreters’ overall gesture frequency, and partly qualitative, concentrating on the interpreters’ gesture types and their functions in relation to utterances (i.e. how gesture phrases are organised in relation to speech phrases in SI). The preliminary results of this experiment, which is part of an ongoing doctoral research project, seem to confirm that there is a correlation between speech content and interpreters’ gestures and that interpreters use gestures even though the people in the audience are not their ‘interlocutors’ in the traditional sense of the word.

References

- Goldin-Meadow, Susan. (2003) *Hearing Gesture. How Our Hands Help Us Think*. Cambridge, Mass. and London, UK: The Belknap Press of Harvard University Press.
- Kendon, A. (2004) *Gesture. Visible Action as an Utterance*. Cambridge, Cambridge University Press.
- Rodrigues, I.G. (2007) “Body in interpretation. Nonverbal communication of speaker and interpreter and its relation to words and prosody.” In: Schmitt, P./ Jüngst, H.(eds.) *Translationsqualität. Leipziger Studien zur angewandten Linguistik und Translaktologie*. Frankfurt a. M.: Peter Lang, 739–753.
- Rodrigues, Isabel G., Zagar Galvão, Elena (2009). The importance of listening with one’s eyes: A Case of Multimodality in Simultaneous Interpreting (in press).
- Pöchhacker, F. (2004) *Introducing Interpreting Studies*. London and New York: Routledge.
- Zagar Galvão, Elena. “Speech and Gesture in the Booth – A Descriptive Approach to Multimodality in Simultaneous Interpreting.” In DE CROM, Dries (ed.). *Translation and the (Trans)formation of Identities, Selected Papers of the CETRA Research Seminar in Translation Studies 2008*. <<http://www.kuleuven.be/cetra/papers/papers.html>>

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When the mouth speaks to the hand

Neurophysiological (Gentilucci et al. 2006) and behavioural (Bernardis and Gentilucci 2006, Barbieri et al. 2009, Chieffi and Gentilucci 2009) evidence suggest that manual and vocal languages share the same communication system. Studies of primate premotor cortex, and, in particular, of the so-called “mirror system” suggest a double hand/mouth motor command system that may have evolved initially in the context of ingestion, and later formed a platform for combined manual and vocal communication (Gentilucci and Corballis 2006). In humans, manual grasp actions affect mouth actions (Gentilucci et al. 2001), and executing (Gentilucci et al. 2001) or observing (Gentilucci 2003, Gentilucci et al. 2004) grasp actions influence syllable production. Consequently, if the hypothesis of the existence of a system reciprocally relating hand and mouth is true, even mouth postures should affect manual actions.

In experiment 1, 10 right-handed participants were required to reach and grasp large and small objects with their right hand in three conditions of mouth posture, which was maintained constant during the entire action. The postures were the following: opened mouth, closed mouth and relaxed mouth posture. The kinematics of the reach and the grasp as well as the mouth posture was recorded and analysed using the optoelectronic SMART system (BTS, Milan, Italy).

The grasp kinematics was affected by the mouth posture. Specifically, peak velocity of finger opening and maximal finger aperture were significantly higher in the condition of opened mouth as compared to the conditions of relaxed and closed mouth. Moreover, the values in the relaxed mouth posture were significantly higher than in the condition of closed mouth. The reach kinematics was also affected by the mouth posture. However, the effect was different. Peak acceleration, peak velocity, and peak deceleration were significantly greater in the conditions of mouth aperture and closure as compared to the relaxed mouth posture. This effect may be explained as a unspecific arm muscle activation consequent to contraction of mouth muscles. Neither mean, nor maximal, nor minimal mouth aperture was modified by the simultaneous reaching-grasping movement.

In order to verify the specificity of the observed relations between mouth and hand, we carried out control experiment 2, in which a new sample of 10 right-handed participants, whose right foot was prehensile, reached and grasped the same objects as in experiment 1, in three conditions of right foot posture: extended foot fingers, flexed foot fingers and relaxed foot fingers. The hand kinematic analysis showed that the grasp and the reach were poorly affected by the foot postures. Specifically, only maximal finger aperture showed a trend to increase in both the conditions of extended and flexed foot fingers as compared to the condition of relaxed foot fingers.

The results of the present study confirm a specific relationship between mouth postures and hand movements. This may constitute the neurophysiological basis by which the relations between word and gesture production developed (Bernardis and Gentilucci 2006, Gentilucci et al. 2006).

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Pointing and theorizing on the evolution of language

Non-verbal communication such as gesture in general, and pointing in particular, is often invoked in the theorizing on the evolution of language. Following Rousseau, some scholars argue that hominin evolution might be characterized by a mute communication phase, where gestures and expressions predominated communication. Vocalisation is argued to have arisen later in time. Authors have provided evidence that suggests that speech might have even been triggered by the evolution of non-verbal communication and thus that gestural language necessarily precedes vocal language (Gontier, 2006b, 2009).

Yet, when the theories are analyzed, it is not always clear whether pointing, gestures, expressions, etc. are to be considered as proper units of language evolution; or whether they are levels where aspects of language evolution evolve; or by which mechanisms they evolve. A methodology will be proposed to tackle these questions more systematically. More specifically, the field of evolutionary biology has progressed immensely by investigating the evolution of life by looking for the units, levels and mechanisms of evolution. Elsewhere (Gontier, 2006a, 2010), I have argued that the field of evolutionary linguistics can benefit from a similar approach by searching for the units, levels and mechanisms of language evolution. The methodology will be exemplified by investigating whether pointing can be regarded as a unit, level or mechanism of language evolution.

References

- Gontier, N. (2006a). Introduction to evolutionary epistemology, language and culture. In: Gontier, N., Van Bendegem, J.P. & Aerts, D. (eds). *Evolutionary Epistemology, Language and Culture – a Non-Adaptationist Systems Theoretical Approach*, pp. 1–29. Springer, Dordrecht (NL).
- Gontier, N. (2006b). An epistemological inquiry into the ‘what is language’ question and the ‘what did language evolve for’ question. In: Cangelosi, A., Smith, A., & Smith, K. *The evolution of language: proceedings of the 6th international conference (EVOLANG 6)*, pp. 107–114. London: World Scientific.
- Gontier, N. (2008). On The Different Applications Of Haeckel’s Biogenetic Law In Language Origin And Evolution Studies. In Kern, S., Gayraud, F. & Marsico, E. *Emergence of Language abilities*, pp. 12–29. Newcastle: Cambridge Scholars Publishing Ltd.
- Gontier, N. (2009). The origin of the social approach in language and cognitive research exemplified by studies into the origin of language. In, Pishwa, H. (ed.), *Language and Social Cognition: Expressions of the social mind*, pp. 25–46. Berlin: Mouton de Gruyter.
- Gontier, N. (2010). *How to identify the units, levels and mechanisms of language evolution. The evolution of language: proceedings of the 8th international conference (EVOLANG 8)*. London: World Scientific.

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Gesture in schizophrenia

In this presentation I will discuss the temporal and semantic relationship between speech and gesture in schizophrenia. Individuals with schizophrenia have difficulty structuring their discourse in a coherent manner, and their tangential speech often seems to be built upon loose semantic or formal associations. In order to better understand the pragmatic and semantic dysfunction in schizophrenic discourse, I employ McNeill's Growth Point theory of gesture (2005) to analyze the narratives of individuals with schizophrenia. Based upon this analysis, it seems that many of the symptoms of schizophrenic speech have clear counterparts in gesture. For instance, individuals with schizophrenia have issues with anaphora and substitution errors that are paralleled and compounded in gesture. Speech/gesture mismatches also appear in schizophrenic discourse. Additionally, there are frequent anticipatory gestures where a gesture repeatedly appears in abbreviated form before it is subsequently produced in its proper context. Furthermore, there is a great deal of perseveration with the form and rhythm of gestures. Individuals with schizophrenia also demonstrate a very rigid and constrained use of gestural form and space. Finally, the ideational flow of individuals with schizophrenia sometimes seems to be driven more by the formal associations in gesture than by topical coherence. These findings on gesture in schizophrenia will help inform models of schizophrenic language production.

References

McNeill, David. (2005). *Gesture and thought*. Chicago: University of Chicago Press.

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The human body as input device: Exploiting metonymic principles for gesture-based interface design

Gesture-based input in Human Computer Interaction (HCI) can be enabled by two broad types of technologies: tangible and deviceless. The more common tangible technology involves the use of touchable surfaces, requiring physical contact for gestural input (e.g. touchpad). The tangible input device stands in for a certain tool or sports equipment (e.g. a volume dial on iPod, golf club). By contrast, the less common and more cutting edge deviceless technologies do not require the manipulation of an input device or a surface, but instead recognize gestures via visual, audio or motion sensors (e.g. Natal Project, Microsoft).

The cognitive-semiotic perspective (Mittelberg & Waugh 2009) taken here suggests that input devices involving external tools impose a contiguity relation (i.e. physical contact) between the objects and the hands manipulating them. In Roman Jakobson's terms (Jakobson & Pomorska 1983), these gestures involve external metonymy. Gestural input in deviceless technologies, however, relies on similarity and/or conventionality relations between the gestures and the actions or objects they represent. These modes also enable the interface to correctly recognize gestures as belonging to the set of gestural signs known by the system. Internal metonymy (i.e. synecdoche) is at work here: the human body becomes (part of) the device.

To date, gesture-based interfaces using deviceless input technology have been mainly employed in gaming and training applications where users 'gesture' the operation of a tool such as swinging a racquet to play tennis or maneuvering a fire extinguisher in fire fighter training. However, little work has been done to understand how the naturalness of gestures in spontaneous interpersonal communication can be exploited for interface design (Buxton 2007). This is largely because interface designers lack a systematic understanding of gesture types, their utility and cognitive implications for communication. For example, how do we design a computer interface to recognize a gesture conveying that the screen be erased – should the computer be designed to recognize the enactment of the erasing gesture as if holding an eraser (external metonymy) or a swiping gesture of the user's hand (internal metonymy) or both? This work aims at developing a framework for the effective use of gestural input drawing from gesture styles in face-to-face communication.

Building on research on gesture-based interface design (Karam 2009; Shaffer 2008) and semiotic approaches to HCI (Anderson 2000), this paper provides HCI design implications derived from an empirical study of gesture use in natural discourse. Subjects (30 native speakers of German) are asked to describe how to perform household chores in order to identify speakers' tendencies to either produce gestures involving some kind of imaginary object or gestures where the hand itself becomes an object (Müller 1998). All gestures are analyzed with respect to the preferred use of external vs. internal metonymy. Findings will feed into future studies using a motion capture system and for the design of deviceless gesture-based interfaces.

References

- Andersen P. B. 2000. What Semiotics Can and Cannot Do for HCI. In CHI'2000 Workshop on Semiotic Approaches to User Interface Design.
- Buxton, B. 2007. *Sketching User Experiences: Getting the design right and the right design*. Elsevier.
- Jakobson, R. & Pomorska, K. 1983. *Dialogues*. MIT Press.
- Karam, M. 2009. *A framework for gesture-based human computer interactions: A guide for researchers and designers*. Müller.
- Mittelberg, I. & Waugh, L.R. 2009. Metonymy first, metaphor second: A cognitive-semiotic approach to multimodal figures of speech in co-speech gesture. In: C. Forceville & E. Urios-Aparisi (Eds.), *Multimodal Metaphor*.
- Müller, C. 1998. *Redebegleitende Gesten. Kulturgeschichte – Theorie – Sprachvergleich*. Berlin Verlag A. Spitz.
- Saffer, D. 2008. *Designing Gestural Interfaces*. O'Reilly Media.

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When words fail: Child and adult language learners and their gestures during expressive difficulties

It is often tacitly assumed both in acquisition and gesture studies that language learners use gestures as a compensatory device to overcome expressive difficulties, especially representational gestures to either facilitate lexical retrieval, conceptualisation, or information packaging, depending on the theory (Alibali et al. 2000; Kita, 2000; Krauss et al., 2000). This notion is explicit in studies of adult second language learners (e.g., Nicoladis et al., 2007), but is also implicit in studies of child language acquisition (e.g., Goldin-Meadow, 2003; Pine et al., 2007). For adults the argument partly hinges on the observation that adult learners typically produce more gestures than native speakers. However, gesture frequency alone is not evidence for gesture compensation. Analyses must also consider what types of gestures occur when during difficulties. If learners use representational gestures as compensatory devices, this predicts that representational gestures should occur in stretches of disfluent speech. However, there is some evidence to suggest that adult learners do not gesture more during silence and that most gestures during expressive difficulties are not representational but pragmatic (Gullberg, 1998), i.e. conveying non-referential meaning (Kendon, 2004). Very little is known about children's corresponding behaviour.

This study therefore aims to (a) examine the nature of learners' 'gestural compensation' by comparing gestures produced in non-fluent vs. fluent stretches, and (b) to explore whether child and adult language learners deploy gestures in the same fashion. The analyses draw on gestures accompanying narrative production by 33 Italian children (4-5; 6-7; 8-10 years) and 16 Dutch adult learners of French as a second language.

Preliminary results indicate that both child and adult L2 learners chiefly produce representational gestures during fluent and two types of pragmatic gestures during non-fluent production. With (filled/unfilled) pauses both child and adult learners produce pragmatic gestures involving agitated or repeated movement, gaze away from the interlocutor and 'thinking faces' (Goodwin & Goodwin, 1986), indicating an ongoing word search but not its referential content (cf. McNeill, 1985, conduit gestures). In contrast, the learner groups differ in their use of modal pragmatic gestures occurring once speech is resumed, conveying that the spoken element offered must be interpreted as a "good enough solution". Such modals are frequent in adult learners, but absent in the four-year-olds, emerging only in six-year-olds.

Learners thus produce different gestures in fluent vs. disfluent speech production, an observation with important theoretical implications for both acquisition and gesture research. Moreover, the study provides some of the first evidence that child and adult learners gesture similarly during breakdowns, but differently during solutions following breakdowns, with modal gestural commentary evolving with increased capacity for discourse management and linguistic meta-awareness (Graziano, 2009).

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Gestures that leave a mark: Multimodality in Central Australian sand stories

Arandic sand stories from Central Australia are a traditional form of women's verbal art in which a skilled narrator incorporates various forms of vocal and kinesic expression – speech, sign, gesture and drawing – to create complex multimodal utterances. The use of the ground for illustrative and explanatory purposes is pervasive in this desert environment where there is ample inscribable ground, and partly this attention to the surface of the ground arises from a cultural preoccupation with observing information encoded on it, such as the tracks of animals and of people. In some stories leaves and other small objects are used to represent story characters. The resultant drawings and mini-installations of objects are both product and process, and involve a complex interplay between dynamic and static elements. Between 'scenes' or 'episodes' the narrator wipes the space on the ground in front of them clean before beginning to draw again. Thus the temporal persistence of visible marks is subservient to broader rhetorical aims. In Aboriginal communities in Central Australia these stories were an important form of entertainment in the pre-television era, and to this day they continue to be a narrative form used for teaching, for demonstrating ceremonial knowledge, and for everyday explications of events.

There have been previous discussions of sand stories (for example Wilkins 1997; Munn 1973). However, apart from Green (2009), there is little that takes a fine-grained approach to the description of the stories, and in particular to their dynamic aspects and the ways that the various expressive elements are orchestrated together. In my doctoral research I found that there are complex interdependencies between the semiotic systems used in sand stories. This suggests that more rigorous understandings of how multimodal systems work can only be reached by considering vocal/auditory and kinesic/visual systems together.

Goodwin (2003:230) has written that "Typologies of gesture have almost completely ignored those that get their distinctive organization from the way in which the gesturing body interacts with other phenomena within a domain of scrutiny, such as tracing, touches, and so on". My research provides evidence that extends the notion of gesture to include various kinds of marks that are made on the ground. In sand stories such actions have 'graphic consequences', resulting in a small set of conventionalised but highly polysemous forms. These have a semanticity that adheres beyond the immediate context of their deployment, even though they are wiped out at the conclusion of successive story scenes. In this paper I give examples that show how a narrator of sand stories keys into the expressive potentials of the semiotic resources at hand in different ways and at different points in time as a story unfolds. The challenges of modelling this complexity demonstrate the need for new theoretical frameworks to describe the interactions of multiple semiotic systems in human communication.

References

- Goodwin, Charles (2003). Pointing as situated practice. In: Sotaro Kita (Ed.) *Pointing: Where language, culture, and cognition meet*. Mahwah, N.J.: Erlbaum, pp. 217–241.
- Green, Jenny (2009) *Between the Earth and the Air: Multimodality in Arandic Sand Stories* (Doctoral Dissertation, University of Melbourne).
- Munn, Nancy (1973) *Walbiri Iconography. Graphic Representation and Cultural Symbolism in a Central Australian Society*. Ithaca and London: Cornell University Press.
- Wilkins, David (1997) Alternative representations of Space: Arrernte Narratives in Sand. In: M. Biemans & J. van de Weijer (Eds.) *Proceedings of the CLS opening Academic Year '97/'98*. Chicago: Chicago Linguistic Society.

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Gestures in film – Describing gestures in American screwball comedies from an interdisciplinary perspective

Most of Screwball Comedies, a Classical Hollywood film genre of the 1930ies and 1940ies, pick out as a main theme ‘marriage’, which is performed by the audiovisual orchestration of the fighting but in the end united couple. In this film genre gestures, words and film composition build a highly dynamic, intertwined structure. Gesture combinations are accentuated by acting as well as by cinematic techniques in a way that various gestural movements of different speakers become perceivable as one entire movement.

The main aesthetic focus of the Screwball Comedy lies in the attraction of the changes in speed and rhythm of gestural movements in interaction with speech, so that gestures resemble in their medial realisation danced choreographies. Gestures and body movements in these comedies evoke spatial and temporal dynamizations of word utterances. The two protagonists that communicate show gestural correspondences although their facial expressions and the semantic of their speech seem to perform only anger and disharmony; This effect is for the most part created by the cinematic image, so that several gestural performances are united into one movement. According to the impact on the spectator’s perception of movements, the fighting couple is and remains so to speak visually married during the whole film, which—as a hypothesis—contributes to the comic effect.

Adopting the linguistic form-based approach to gesture analysis (Müller 2007) to the film-analytical perspective of an aesthetic audiovisual composition based on expressive movement (Ausdrucksbewegung) (Kappelhoff 2004, 2008) will be my main method for describing gestures and body movements in their audiovisual orchestration. Built on this interdisciplinary approach my work takes furthermore into account approaches of Film Theory on the Movement-Image (Deleuze 1986), works on Gestalt and Movement Perception (Arnheim 1972/1996; Michotte 1948/2003) and Acting Theory on Body Movement (Eisenstein 1922/1996).

In this talk I want to show that within Screwball Comedies narratives such as ‘marriage’ not only take place in cognitive processes of the spectator but are based on bodily and perceptive experience, which can be described on the level of form-based microanalysis of gestural movement: units of expressivity, which are realized on the level of a concrete perceptive experience of the spectator, compose the physic experience of comedy within the film’s temporal unfolding. This argument offers new perspectives not only to Theory on Film Comedy but also to the Film Theory issue of Body Genres (Williams 2000) that is for film comedy not nominated and proved exploratively.

References

- Arnheim, R. (1972/1996) *Anschauliches Denken. Zur Einheit von Bild und Begriff*. Köln: DuMont.
- Deleuze, G. (1986) *Cinema I: The Movement-Image*. Minnesota: University of Minnesota Press.
- Eisenstein, S. M. & Tretyakov, S. (1922/1996) Expressive Movement In: A. Law & M. Gordon (Eds.): Meyerhold, *Eisenstein and Biomechanics – Actor Training in Revolutionary Russia*. London: McFarland, S. 173–192.
- Kappelhoff, H. (2004) *Matrix der Gefühle. Das Kino, das Melodrama und das Theater der Empfindsamkeit*. Berlin: Vorwerk 8.
- Kappelhoff, H. (2008) Die Anschaulichkeit des Sozialen und die Utopie Film. Eisensteins Theorie des Bewegungsbildes. In: G. Boehm, B. Mersmann & C. Spies (Eds.): *Movens Bild. Zwischen Evidenz und Affekt*, München: Wilhelm Fink Verlag, S. 301–324.
- Michotte van den Berck, A. (1948/2003) Der Realitätseindruck der filmischen Projektion. In: *montage/av*, 12,1.
- Müller, C. (2007) MGA – Methods of Gesture Analysis. Unpublished Manual.
- Williams, L. (2000) Film Bodies: Gender, Genre, and Excess. In: R. Stam & T. Miller (Eds.): *Film and Theory. An Anthology*. Malden/Oxford: Blackwell.

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The other’s gesture and the other’s speech in Russian gesticulation (using MURCO data)

In the paper we want to give the general outline of the Multimodal Russian Corpus (MURCO), which will be open for free access in 2010 in the framework of the Russian National Corpus (RNC) (<http://www.ruscorpora.ru/>). The MURCO includes the clips from the Russian movies, which are aligned with the corresponding zones of the movie transcripts. So, the output units of the MURCO are the pairs clip+text (or the clixts), in which the text is annotated from the point of view of 1) morphology, 2) semantics, 3) sociology, 4) accentology, 5) phonetics and orthoepy [see Grishina 2009a, Grishina 2009b]. The total volume of the MURCO will be circa 4 million tokens, or more than 500 hours of phonation.

In addition to the standard types of annotation in the MURCO we plan to apply the deep annotation to some movies. Every clixt ought to be described from the point of view of the speech acts, which take place in it, and also from the point of view of the participants’ gesticulation [see Grishina 2009a, Grishina 2009c]. The volume of the deeply annotated subcorpus will be about 15% of the total volume of the MURCO. To mark up the deeply annotated subcorpus of the MURCO we have had to elaborate 1) the systematization of the speech acts, which is based on the whole set of the Russian speech verbs, and 2) the practical gesture classification, which gives us the possibility to annotate movie gestures from the point of view of their technical characteristics (main, active, passive organs, and some others) and from the point of view of their meaning (the description of the gesture meaning consists of the triad “gesture type – gesture contextual meaning – gesture name”).

The consecutive annotation of all clixts and of all gesture-tokens in a movie have given us the possibility to notice, classify and describe the groups of the gestures, which have not been in the focus of research attention to the right degree. One of these groups is the gestures, which 1) portray the other’s (the interlocutor’s) speech, 2) anticipate the other’s gestures, when a speaker makes the gesture, which he anticipates the interlocutor to make, 3) accompany the reported speech, 4) reflect the interlocutor’s gesture behavior. Transforming the Bakhtin’s terms [see Bakhtin 1979], we may name these classes of gesture usage the other’s gesture (the analogue of the other’s speech) and the reflected gesture (the analogue of the reflected speech).

In our paper we plan to give the examples of all these types of the other’s gesticulation and to try to analyze them.

References

- Bakhtin 1979 – M.M.Bakhtin. *Problema rechevyh zhanrov*. M., 1979
- Grishina 2009a – E.A.Grishina. Mul’timedijnyj Russkij Korpus (MURCO): problemy annotacii // Nacional’nyj korpus russkogo jazyka: 2006–2008. Novyje rezul’taty i perspektivy. SPb., 2009, p. 175–214, available at http://docs.google.com/View?id=df52fjjj_363wxt76dk
- Grishina 2009b – E. Grishina. Multimodal Russian Corpus (MURCO): types of annotation and annotator’s workbenches // 5th International Corpus Linguistics Conference, Liverpool, 20–23 July 2009 (forthcoming), available at http://docs.google.com/View?id=df52fjjj_32f2s6f9g6
- Grishina 2009c – E. Grishina. Multimodal Russian Corpus (MURCO): general structure and user interface // 5th International Conference SLOVKO 2009 (NLP, Corpus Linguistics, Corpus Based Grammar Research), Bratislava, 25–27 Nov. 2009 (forthcoming), available at http://docs.google.com/View?id=df52fjjj_31g26878g7

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How to talk and gesture about motion in French and English: Crosslinguistic and developmental perspectives

Studies show that adult speakers of different languages talk and gesture differently about the path and manner of motion depending on the properties of their language such as whether it is satellite- or verb-framed (e.g., Aurnague et al., Duncan, 2005; Kita & Özyürek, 2003; McNeill, 1992). The parallel differences across modalities concerning what information is targeted for expression suggest crosslinguistically different event representations. The question arises how children develop such language-specific representations. Do they target the same information as adults and does the relationship between speech and gesture change during development? Despite a few recent studies in this domain (e.g., Özyürek et al., 2008), the developmental trajectories towards language-specific preferences remain poorly understood and under-researched.

This paper examines how French and English adults and four- and six-year-old children learning these languages talk and gesture about motion, French being verb-framed and English satellite-framed. Participants retold animated cartoons of motion events (e.g., the squirrel climbed up the tree) half of which showed path and manner as equally relevant, half of which targeted manner alone. We examine which meaning components are expressed in speech and gesture, and the degree of co-expressivity across the modalities based on a narrow analysis of cross-modal temporal overlap.

The results show that when path and manner are equally relevant, French adults predominantly talk about path and English adults about manner and path. Both groups mainly gesture about path-only, but unlike French adults, English adults also conflate path-manner into single gestures. Second, French and English children display adult-like, language-specific speech by age 4 and adult-like gesture preferences for path. However, the child groups also differ: French children conflate path-manner less with increasing age, whereas English children conflate more, both groups approaching the adult preference only gradually. Third, speech and gestures are predominantly co-expressive in both language groups and at all ages (path in speech and gesture). However, when modalities differ, English adults typically provide less information in gesture (path) than in speech (path-manner; ‘manner modulation’), whereas French adults express complementary information in speech (manner) and gesture (path). Again, children develop these language-specific adult preferences gradually. Language-specific speech thus develops early, but language-specific gestures later (cf. Özyürek et al., 2008).

The findings have theoretical implications for acquisition suggesting that language-specific event representations continue to develop in later childhood as revealed only in bi-modal analyses. The results also have theoretical implications for gesture studies, raising questions about cross-modal information distribution in adults and children and about the nature of gesture-speech integration.

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Ontogenetic ritualization of gestures in mother-infant bonobos (*pan paniscus*): The problematic accomplishment of carries

There is general agreement among researchers that nonhuman primates gesture in sophisticated ways (Tomasello & Call 2007; Pollick & de Waal 2007). However, the process by which apes acquire gestures is an issue of debate (Genty et al. 2009). One of the central questions in this debate is whether apes acquire species-typical gestural repertoires, with little individual innovation (the biological inheritance hypothesis), or whether they develop gestures individually through the ritualization of particular social acts (ontogenetic ritualization). In this talk, we address this question by examining the relationship between the structure of a particular social interaction and the form of the gestures used to elicit that interaction. We present data on nine mother-infant bonobo pairs as they engage in a particular social interaction: co-locomotion via a ventral or dorsal carry. We analyzed these interactions following the methodology of Conversation Analysis by focusing on the sequential organization of actions.

Carries are asymmetrical behavioral interactions in that the two participants must perform different actions in order to accomplish the task—for example, a mother picks up her infant, but not the reverse (Hutchins & Johnson 2009). Also, in bonobos, the carry interaction has a similar structure across pairs—different mothers tend to pick up their infants in similar ways. Given this, if gestures are ritualized social acts, then mother-infant differences in gestures should be greater than mother-mother and infant-infant differences. In addition to this, if the gestures used to request carries are ritualized forms of the actions typically used to accomplish a carry, then there should be qualitative similarities between the two. Preliminary analyses indicate that both of these trends occur in the bonobo carry interactions investigated here. Though we take this as evidence for the ontogenetic ritualization of some gestures in apes, we emphasize the need for more detailed studies of the relationship between gesture form and function in order to better understand how ontogenetic ritualization works and how it interacts with other developmental processes (cf. Kendon 2008).

References

- Genty, Emilie, Thomas Breuer, Catherine Hobaiter, & Richard W. Byrne (2009). Gestural communication of the gorilla (*Gorilla gorilla*): repertoire, intentionality and possible origins. *Animal Cognition*, 12, 527–546.
- Hutchins, Edwin & Christine M. Johnson (2009). Modeling the Emergence of Language as an Embodied Collective Cognitive Activity. *Topics in Cognitive Science*, 1, 532–546.
- Kendon, Adam (2008). Review of “The gestural communication of apes and monkeys” by Josep Call and Michael Tomasello, eds. London: Lawrence Erlbaum Publishers, 2007. *Gesture*, 375–385.
- Pollick, Amy S. & Frans B. M. de Waal (2007). Ape gestures and language evolution. *Proceedings of the National Academy of Sciences*, 104(19), 8184–8189.
- Tomasello, Michael & Josep Call (2007). Comparing the gestures of apes and monkeys. In J. Call & M. Tomasello (Eds.), *The gestural communication of apes and monkeys* (pp. 197–220). London: Lawrence Erlbaum Publishers.

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Communication systems shape the natural order of events: Competing biases from grammar and pantomime

When observing a transitive event (e.g. a person lifting a box), the various components of the scene *occur* simultaneously, but to *describe* that event, it is necessary to sequentialize them. This requires people to make choices about the order in which to mention the actor(Ar), the patient(P), and the action(A). In English, the grammar makes Ar-A-P order most common. Interestingly, another order emerges across diverse populations when using pantomime: Ar-P-A (1). Here, we explore the competing pressures exerted by the grammar bias and the pantomime bias under conditions that are intermediate between language and pantomime.

Experiment 1 replicated the finding that native English speakers use Ar-P-A order when speaking, but Actor-Patient-Act (Ar-P-A) order in pantomime. In Experiment 2, a new group of native English speakers viewed the same events. All participants learned an artificial lexicon consisting of 4 verbs, 4 nouns, and 1 locative marker. No information was given about the order in which these elements should be arranged. Half of the participants learned a spoken lexicon while half learned a signed lexicon.

If the pantomime bias is so strong that it appears whenever grammar is removed, then participants in both groups should use Ar-P-A order to describe events using their novel lexicon. If the pantomime bias is stronger when participants communicate with their hands, the participants who learned a signed lexicon should be more likely to use Ar-P-A. If the pantomime bias is overridden by the grammar bias in the presence of a lexicon, then neither group should use it. Results favored this last hypothesis: both groups overwhelmingly used Ar-A-P ordering, suggesting that the presence of a lexicon is enough to trigger L1 syntax. Modality had no impact, suggesting that the Ar-P-A pattern observed in pantomime cannot be attributed to the use of the hands, per se.

Whereas Experiment 2 brought language one step closer to pantomime (by removing syntax), Experiment 3 brought pantomime one step closer to language by asking participants to simply be consistent with the pantomimes they produced. This essentially requires subjects to create their own lexicon, but its properties will be more pantomime-like. If the strong grammar bias seen in Experiment 2 extends to a self-generated, pantomimic lexicon, participants in Experiment 3 should use Ar-A-P ordering. Alternatively, the pantomimic devices available to the participants might allow the pantomime bias to win out, resulting in Ar-P-A order.

Results revealed that although most participants did have a preferred order, it was not always the same one. The most preferred order was still Ar-P-A, suggesting that the pantomime bias is powerful when participants exploit the affordances of the manual modality to create their own labels. However, the next most popular order was Ar-A-P, suggesting that for some participants, the simple requirement of being consistent was enough for the grammar bias to win out. Finally, a small number of participants used other orders (e.g. P-Ar-A), or had no consistent preference. These findings suggest that the Ar-P-A bias may be more task-specific than has been previously claimed.

References

Goldin-Meadow, S., So, C. W., Özyürek, A., & Mylander, C. (2008). The natural order of events: How speakers of different languages represent events nonverbally. *Proceedings of the National Academy of Sciences*, 105(27), 9163–9168.

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The kinesic code in use among workers in a salmon factory

In environments where speech is inappropriate, people naturally begin to communicate with gestures. If that environment is a workplace where the same people gather daily, spontaneous gesturing can develop into a more elaborate system of shared gestures, known as a 'kinesic code' (Kendon 2004). Researchers have described kinesic codes in use on a building site (Brun 1969) and in a saw mill (Meissner & Philipott 1975). More general observations indicate that kinesic codes emerge in airports, casinos, auctions, and restaurants (Morris 2002) as well as in broadcast studios, race tracks, and stock exchanges (Kendon 2004).

In this paper, I shall present the kinesic code in use among workers in a salmon factory. During summer 2009, I spent three months documenting communication along the production line in one of France's largest salmon factories, where 350 workers from various linguistic backgrounds work daily under high productivity demands and against the constant noise of whirling ventilators and rumbling machinery. Additional factors rendering speech extremely difficult are the face masks and earplugs worn by all workers, as well as the inappropriate layout of the shopfloor that hinders communication by separating workstations with machinery and partitions. Regular communication on the shopfloor is nevertheless crucial for troubleshooting and efficient workflow.

After a description of the factory and the ethnographic methods I used, I shall present a typology of the gestures in use among workers and explain what each gesture is for, showing that four main categories emerge: gestures about the flow of raw material, gestures about problems with the raw material, gestures about problems with the machinery, and gestures about work procedures. I shall examine the forms of these gestures and investigate how they encode messages in ways similar to co-speech gestures and gestures in sign languages. Showing two stretches of video footage from the factory, I will analyse how workers sequence and combine the gestures into kinesic utterances. Speech would be insufficient here, but this communicative practice allows the workers to guide one another around the shopfloor so that problems related to workflow can be fixed as quickly and as efficiently as possible. Finally, I will situate this kinesic code in relation to other codes, highlighting factors that have led to its elaboration and pointing out constraints on its complexity.

This presentation takes gesture studies beyond spontaneous conversations and builds on previous work on kinesic codes in speaking communities. Researching gestures in factories is part of a broader project to improve communication in industry (Harrison 2009).

References

Brun, T. (1969) *The International Dictionary of Sign Language*. London: Wolfe Publishing Ltd.
Harrison, S. (2009) Manufacturing Communication. The analysis, development, and implementation of gestural codes in industrial settings. Guest lecture for the Natural Media & Engineering group at HumTec Centre, RWTH University, October 12 2009.
Kendon, A. (2004) *Gesture: Visible Action as Utterance*. Cambridge University Press.
Meissner, M. & S.B. Philipott (1975) The sign language of sawmill workers in British Columbia. In *Sign Language Studies*, 9: 291–347.
Morris, D. (2002 [1977]) *People Watching*. Vintage.

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Morphosyntactic correlates of gestures: A comparison between negation gestures in English and French

When speakers produce negative utterances, they often perform gestures that relate to the negation. These negation gestures include the headshake and a variety of manual gestures that speakers perform with the open hand held so that the palm is either vertical or horizontal (Calbris 1990, Kendon 2004). In recent work, Harrison (2009) analyzed a 12-hour audiovisual corpus of conversations among English speakers and identified nine gestures of negation. He observed that in propositional negations with sentential negatives, speakers tended to coordinate the gesture stroke with the negative particle and then co-extend a post-stroke hold throughout negative scope (Harrison f.c.).

In these cases, negative gestures in English occur both simultaneously and posterior to the morphosyntactic expression of sentential negative markers, but not anterior to them. This is in line with the sensitivity to linear order induced by the grammar of negation: negative polarity items are found in the vast majority of instances to follow rather than precede negatives, as in (i) and (ii):

(i) There wasn't anyone vs. Anyone wasn't there

(ii) Paul talked to nobody at all vs. Paul talked at all to no one

And the same goes for a large number of cases of negative focus, as evidenced by the difference between (iii) and (iv):

(iii) The committee didn't shortlist only 2 candidates

(iv) Only 2 candidates weren't shortlisted by the committee

If the morphosyntactic expression of sentential negation determines gesture organization in English, gesture organization should be similar in French, where the main marker of negation in informal negative propositions is a postverbal adverb with similar morphosyntactic properties to English 'not'. Given that French speakers also perform gestures of negation (Calbris 1990), the way they distribute and organize their negation gestures should be similar to English speakers. In this paper, we use an audiovisual corpus of interactions within a French lifeguard team to test our hypotheses.

By looking at the distribution of negative gestures in relation to the morphosyntactic expression of negation cross-linguistically, we consider how speakers of different languages integrate their gestures with speech in similar ways. We show how this conventional integration of gesture with other meaningful units of the languages, including morphosyntactic and prosodic units, contributes in both cases to the production of meaningful negative propositions. This study not only compares English and French, but also provides a base for useful comparisons with gestures of negation in signed languages, where research has highlighted subsidiary hand, face and head signs that also accompany the main negative sign (Antzakas 2008, Neidle et al 2000, Zeshan 2004). But the general determinism presented by these studies remains to be spelt out and compared to spoken language.

The broader goal of this paper is to investigate how conventional units of meaning relate to each other across modalities to produce coherent and meaningful messages.

References

Antzakas, Klimis. 2008. Aspects of morphology and syntax of negation in Greek Sign Language. *Sign Language & Linguistics* 11, 2, 265–275.

Calbris, G. (1990). *The Semiotics of French Gesture*. Bloomington: Indiana University Press.

Harrison, S. (2009) Grammar, gesture, and cognition: The case of Negation in English. Ph.D. Dissertation, Université Michel de Montaigne—Bordeaux 3, Bordeaux, France.

Harrison, S. (f.c.) Evidence for node and scope of negation in coverbal gesture.

Kendon, A. (2004) *Gesture: Visible Action as Utterance*. Cambridge: Cambridge UP.

Neidle et al. (2000). *The syntax of American Sign Language. Functional categories and hierarchical structure*. The MIT Press.

Zeshan, U. 2004. Hand, head, and face: Negative constructions in sign languages. *Linguistic Typology*, 8, 1, 1–58.

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Marker analysis: Geometrical dimensions of gestural form

Human beings make sense of their environment by reducing it to fewer dimensions: one measures the human body (a three-dimensional entity) using one-dimensional parameters, such as height, weight, and waist circumference. Perception of the three-dimensionality of objects in the world is based on tactile contact with a (two-dimensional) surface (cf. Stout 1899). Only through a succession of various contacts (stationary and moving) with the object can its spatial extension as well as its consistency and surface structure be inferred (cf. Howe & Cutkosky 1993, Stout 1899).

In formal analyses of gesture, scholars study articulator movements in space. This paper proposes a new perspective: we focus on 'markers', i.e. salient features of the articulators which coincide with salient formal aspects of the referred object (cf. "active zones" in Langacker 2002) and which are used to create meaning. The functions of these markers are constrained by geometrical dimensions: pointing at (0D), outlining (1D), modelling (2D) or representing (3D) salient portions of an object. These actions comprise two stages: 1) selecting and 2) using the appropriate markers. The speaker selects a marker by making his articulator assume a constellation in which a simple geometrical form is salient (Mittelberg 2010). Then, the marker can be used according to the communicative goal.

Müller (1998) classifies the ways in which the hands create meaning via four modes of representation: the hands outline, model, act or represent. In contrast to other categorisations, her approach is characterized by its use of formal criteria to investigate how gestures form signs. The marker theory proposed in this paper builds on this approach. It is an attempt to find the principles underlying Müller's modes of representation while including one of the most prominent kinds of gestures: pointing (cf. Kita 2003). Moreover, our analysis of markers takes into account processes of internal and external metonymy (Jakobson 1963, Mittelberg & Waugh 2009) and metaphor (Müller 2008) that are involved in meaning creation. The following aspects of the two stages of marker involvement are addressed:

1) Marker selection: Müller's modes of acting and representing (1998) are analogous to three-dimensional markers described in the present framework. The approach presented in this paper, however, also sees low-dimensional markers (0D=point, 1D=line, 2D=surface) as the building tools employed when performing any gesture. A zero-dimensional marker, for example, is a spot pointed at; a one-dimensional marker is a path indicated when showing a direction (cf. Wilkins 2003), and a two-dimensional marker would be holding the hand open with extended fingers as if touching a flat surface.

2) Marker usage: In the meaning-making process, these markers can be modified in various ways: the most powerful is moving a marker through space and thereby expanding its dimensionality. A one-dimensional form emerges by moving a pointing index finger (a zero-dimensional marker) along a one-dimensional path. Other examples are bending and curving an established marker or simultaneously using different parts of the body in multi-articulation (cf. Hassemer 2009).

We maintain that tracking the geometrical form of markers using a motion-capture system, which our research team is currently setting up, will facilitate a comprehensive analysis of gesture.

References

- Hassemer, J. (2009). Chief Pointing-Eye. Multiarticulatory metaphorical gestures expressing high. Unpublished Master's Thesis at the European University Viadrina Frankfurt/Oder.
- Howe, R.D. & M.R. Cutkosky (1993). Dynamic Tactile Sensing: Perception of Fine Surface Features with Stress Rate Sensing. P. 140–151 in: *IEEE transactions on robotics and automation*, vol. 9, No. 2.

- Jakobson, R. (1963). Parts and wholes in language. P. 110–114 in L. Waugh, M. Monville-Burston (eds.). *On Language*. Harvard University Press.
- Kita, S. (2003). Pointing: A Foundational Building Block of Human Communication. P. 1–8 in: S. Kita: *Pointing. Where Language, Culture, and Cognition Meet*. Psychology Press.
- Langacker, R.W. (2002). *Concept, Image and Symbol. The Cognitive Basis of Grammar*. Mouton de Gruyter.
- Mittelberg, I. & L. Waugh (2009). Metonymy first, metaphor second: A cognitive-semiotic approach to multimodal figures of thought in co-speech gesture. P. 329–356 in E. Urios-Aparisi [eds.]: *Multimodal metaphor*. Mouton de Gruyter.
- Mittelberg, I. (2010). Geometric and image-schematic patterns in gesture space. P. 351–385 in V. Evans & P. Chilton (Eds.), *Language, Cognition and Space: The State of the Art and New Directions*. London: Equinox.
- Müller, C. (1998). *Redebegleitende Gesten: Kulturgeschichte – Theorie – Sprachvergleich*. Berlin Verlag Arno Spitz.
- Müller, C. (2008). *Metaphors Dead and Alive, Sleeping and Waking. A Dynamic View*. University of Chicago Press.
- Stout, G. F. (1899). *A Manual Of Psychology*. University Correspondence College Press, London.
- Wilkins, D. (2003). Why Pointing With the Index Finger is Not a Universal (in Sociocultural and Semiotic Terms). P. 171–215 in: Sotaro Kita: *Pointing. Where Language, Culture, and Cognition Meet*. Psychology Press.

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My hands are tied: The influence of gestures on speech

Research has shown that there is a close relationship between speech and gesture (McNeill 1992; Kendon 2004). However, many aspects of the exact relationship between speech and gesture remain unknown (see for an overview, de Ruiter 2007). For example, we do not know very much about the way in which gestures might directly influence our speech. Previous research has looked at the influence of beat gestures on acoustic aspects of speech (Krahmer and Swerts 2007) and some initial work has been done on the influence of gestures on lexical aspects of speech (Hostetter, Alibali, Kita 2007). In this study we want to extend our knowledge about the direct influence of gestures on speech by looking at what lexical changes might occur in speech when people cannot gesture.

An experiment was conducted where 38 participant pairs took part in a director matcher task. In this task the director had to watch two sets of video clips of someone tying a tie knot and after watching these video clips instruct the matcher how to tie an actual tie in the same manner. All directors had to sit on their hands for either the first half or the second half of the experiment. The proceedings of the experiment were recorded by video camera.

Results showed that the ability to gesture has an influence on the number of words the directors use to instruct the matcher. When the directors were in a completely natural situation in which they were free to gesture and could see the matcher, they used significantly fewer words ($M=36$) to instruct a video fragment to the matcher than when they could not use their hands or could not see the matcher ($M=50$). When comparing lexical aspects of speech across conditions, the results showed that directors used more indexicals when they could gesture compared to when they could not use their hands. By looking at the speech used when directors gesture and comparing this to the directors' speech when they could not gesture, we get an explicit insight into the lexical meaning of a gesture, something that has not been done before.

References

- de Ruiter, J. P. (2007). Postcards from the mind: the relationship between speech, imagistic gesture, and thought. *Gesture* 7(1): 21–38.
- Hostetter, A. B., M. W. Alibali, S. Kita (2007). Does sitting on your hands make you bite your tongue? The effects of gesture prohibition on speech during motor descriptions. *Proceedings of the 29th annual meeting of the Cognitive Science Society*. D. S. McNamara and J. G. Trafton. Mahwah, NJ, Erlbaum: 1097–1102.
- Kendon, A. (2004). *Gesture. Visible action as utterance*. Cambridge, Cambridge University Press.
- Krahmer, E. and M. Swerts (2007). The effects of visual beats on prosodic prominence: acoustic analyses, auditory perception and visual perception. *Journal of Memory and Language* 57: 396–414.
- McNeill, D. (1992). *Hand and mind. What gestures reveal about thought*. Chicago, University of Chicago Press.

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Co-speech gestures in response to addressee feedback

Much research has focused on whether co-speech gestures communicate or not. We now have substantial evidence that co-speech gestures do communicate information to addressees and that they are often communicatively intended (e.g., Holler & Beattie, 2003; Holler, Beattie & Shovelton, 2009; Melinger & Levelt, 2004). However, we still know very little about the role of co-speech gestures in the actual process of communication. Language use is a joint, collaborative activity involving both the speaker and the addressee (Clark, 1996). In order for communication to be successful, individual contributions from these partners have to be grounded; as part of this process, addressees respond to speaker's presentations, and often these responses serve to further clarify what is meant (see Clark & Brennan, 1991, for examples). Although researchers have explored the verbal side of this process, not much is known about the use of gestures in this context. One interesting question is to what extent addressees shape speakers' gestural communication. Bavelas, Gerwing, Sutton and Prevost (2008) have shown that co-speech gestures are integral to dialogue and hence 'need' addressee responses. Further, Kendon (2004) and Tabensky (2001) have provided detailed descriptions of instances in which speakers respond to addressees by offering rephrasings of what they or the other person just said, with a focus on the interplay between the two modalities in these rephrasings. The present study builds on this work. It is a first attempt to systematically investigate the patterns of speakers' gesture use in response to addressees' feedback by comparing the qualitative nature of the gestures and their frequency/rate before and after feedback. It is based on a dataset of participants narrating a story to a confederate addressee. At certain points in the narrative, the addressee delivered scripted forms of feedback with the aim to receive clarification or confirmation. The analysis focused on the speakers' gestures before and after feedback when referring to the same semantic event. The findings show that speakers (i) gestured at a lower rate after the addressee's feedback (i.e., the gestures appeared to be targeted at addressing the particular semantic aspect queried by the addressee), (ii) used larger gestures following addressee feedback, and (iii) performed more precise gestures following feedback. These findings reveal some important ways in which speakers appear to redesign their gesture-speech utterances to respond to addressees' expressed lack of clarity. Additional analyses still in progress focus on a comparison of the different types of feedback provided (e.g., question or assertion) and the effect on speakers' gestural responses, as well as on a comparison with a corpus of more natural, spontaneous interactions to complement the confederate data. The outcomes of these analyses will also be presented. In sum, the findings provide a first glimpse of the role of co-speech gestures in clarifying meaning in response to addressee feedback – a core aspect of the process of grounding. The insights gleaned from this study will help to refine and expand our understanding of the social and communicative functions of co-speech gestures in face-to-face dialogue.

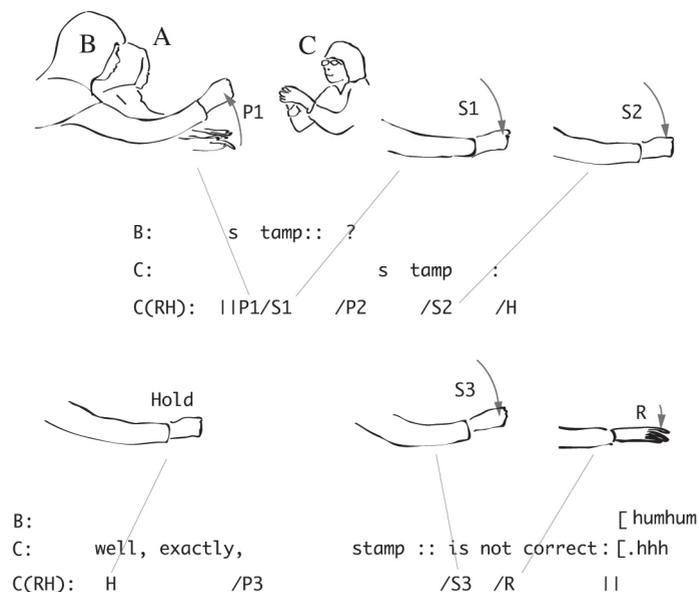
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Extended gesture unit and adjacency pair

Kendon (2004) defined a gesture unit as the interval between successive home positions of the limbs. He also defined preparation, stroke, hold (pause), and recovery as different kinds of gesture phase in a unit, and showed how the phases of speaker's gestures are well coordinated with the structure of his/her utterances. In ordinary conversations, however, single gesture unit is not limited within a turn, but often extended to the next turn of the other speaker, and new phases are produced even while the producer of the gesture makes no utterance. This presentation considers examples of extended gestures enacted by the first speaker in an adjacency pair and a post-expansion. The data are taken from conversations of 3 undergraduate students talking about their experiences. In these simple examples, the gesture of the first speaker continued until the first speaker enacted the sequence-closing third. In examples illustrating the organization of dispreference, the time structure of the gestures is coordinated with the utterances of both first and second speakers: prolonged gestures by the first speaker are delayed, mitigated, or elaborated (Schegloff 2007) according to the structure of the second pair part

When preferred responses are elaborated and rendered more complex, gesture phase can be elaborated according to the structure of the responses. We discuss the properties of an extended gesture, which is produced by an utterance of one party and continued over multiple turns, in order to reconsider the second pair part activity as the interactive process of the first speaker and the second speaker.

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Mind in motion: A test of the gesture as simulated action framework

Embodied theories of cognition posit that language processing involves mental simulations of actions and perceptions (e.g., Barsalou, 1999). For example, comprehending a word such as pick involves the same motor areas of the brain that are involved in producing a picking action (Pulvermüller, 2005). The Gesture as Simulated Action (GSA) framework (Hostetter & Alibali, 2008) holds that mental simulations also occur during language production, and they give rise to representational gestures. When speakers describe information that they understand partially through physical experience, they mentally simulate the corresponding actions, and some of these actions are overtly expressed by their motor system during speech production. The GSA framework thus claims that speakers should gesture more when describing images they have physical experience creating than when describing images that are less closely tied to action. Three experiments tested this hypothesis.

In Experiment 1, speakers saw 6 patterns consisting of dots connected with lines to form geometric figures. In the visual condition, the patterns each appeared for 10 s on a computer screen before disappearing. Participants described the locations of the dots in terms of the geometric shapes. In the action condition, the patterns appeared for 3 seconds. Participants then recreated the dot patterns by placing round, wooden pieces on the table in front of them. The pieces were cleared away, and the participants described each pattern as they did in the visual condition. As predicted, speakers produced more representational gestures per 100 words when describing patterns they constructed ($M=8.18$, $SD=5.49$) than when describing patterns they viewed ($M=6.49$, $SD=5.31$), $t(32)=3.20$, $p=.003$.

In Experiment 2, the amount of time participants had to verbally rehearse their descriptions was equated. The action condition was identical to that in Experiment 1. However, in the visual condition, the patterns disappeared after only 3 seconds, and participants were asked to immediately begin describing the pattern, thus eliminating the possibility that speakers could verbally rehearse their descriptions in the visual condition. Speakers again gestured at a higher rate in the action condition ($M=12.16$, $SD=6.68$) than in the visual condition ($M=10.25$, $SD=6.21$), $t(33)=2.28$, $p=.03$.

Experiment 3 considered the possibility that the effects in Experiments 1 and 2 were due to a general prime to move more in the action conditions. Experiment 3 replaced the visual condition with a motor tapping condition, in which participants tapped repeatedly on the table while viewing the pattern. Thus, both conditions primed speakers to move, but the movement was tied to their representation of the pattern only in the action condition. Again, speakers gestured more when describing patterns they had made ($M=9.93$, $SD=7.41$) than when describing patterns they had viewed while tapping ($M=7.95$, $SD=6.46$), $t(32)=2.75$, $p=.01$.

In sum, speakers gesture more when they have physical experience of the patterns than when they do not, as predicted by the GSA framework.

References

- Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences*, 22, 577–660.
 Hostetter, A. B., & Alibali, M. W. (2008). Visible embodiment: Gestures as simulated action. *Psychonomic Bulletin & Review*, 15, 495–514.
 Pulvermüller, F. (2005). Brain mechanisms linking language and action. *Nature Reviews*, 6, 1–6.

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Estonian and French emblematic gestures: From a comparative research to a video dictionary of gestures

Although Estonian and French cultures do not have a common geographical border, these two cultures meet nowadays by virtue of travelling on various purposes, the media as well as the common space of European Union. This report presents a research which objective was to determine the differences and/or similarities between emblematic or autonomous gestures (Efron 1972) used in Estonian and French cultures. Conduction of such comparison presupposes collecting data of hand gestures of both cultures. Autonomous gestures of Estonians and the French were collected for the research on the basis of sampling method. The method used in the research revealed distinctly some gestures which are inherent merely to the Estonian or the French cultural space, and also certain amount of gestures which have the same meaning in both cultures. Most interesting were the gestures which physical performance was similar in both cultures, but the meaning was partially or absolutely different in comparative cultures. There were also gestures which had several different meanings even within the same culture. An article has also been published on the basis of the research (Ingerpuu-Rümmel 2004). The gestures studied with the abovementioned method that can be considered to belong to either of the cultures have been presented on paper and on a CD. The CD has been produced with the support of the French Cultural Centre located in Estonia. The CD enables to search for French and Estonian gestures, and it has been produced in Estonian and in French language. The gestures are on the CD in the form of video clips. The dictionary of gestures is useful to language learners, teachers and everyone who has contact with these respective cultures (for example friendships, business communication, and tourism).

References

- Calbris, G., J. Montredon 1986. *Des gestes et des mots pour le dire*. Paris: Clé International.
- Efron, D. 1972. *Gesture, Race and Culture*. Paris & Hague: Mouton. (Originally published in 1941 as *Gesture and Environment*. New York: King's Crown Press.)
- Ingerpuu-Rümmel E. 2004. Les gestes communicatifs des français et des estoniens: une approche comparative. – *L'image en questions: Procédures de mise en texte*. (eds) M. Käsper, Tartu: Centre d'Etudes francophones Robert Schuman, University of Tartu, 145–158.
- Kendon, A. 1995. Andrea De Jorio – the first ethnographer of gesture? – *Visual Anthropology*, 7, 375–394.
- Payrató, L. 2003. What does the same gesture mean? A reflection on emblems, their organization and their interpretation. – *Gestures. Meaning and Use (Proceedings)*. Ed. by M. Rector, I. Poggi, N. Trigo. Oporto: Edições Universidade Fernando Pessoa, 73–82.

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Successful head-nodding movements in psychotherapeutic process – When and how

Statement of Problem: As Rogers (1951) pointed out, it is critically important for a therapist to listen to the client skillfully for the counseling to be successful. The therapists thus have to acquire the skill as part of their expertise. A commonly used technique to address listening attitude is verbally repeating clients' statements or conducting reflection of their feelings. One of the problems with therapists without much clinical experience is that they use techniques mechanically without considering when and what techniques to use to fit into the therapeutic context. As a result, clients sometimes feel unattended by the therapist even though the therapists try to show their listening attitude using the verbal techniques. We expect that gesture, especially nodding, plays a certain role to make those verbal techniques effective to give an impression that the client is being attended by the therapist.

Skillful therapists would say they know when and how they use gestural techniques such as head-nodding, but their knowledge is often based solely on their experience. The present research project is concerned with the following two questions: 1) Does the frequency of head-nodding movements change as therapeutic stages (initial stage, exploration stage, struggling stage, and closing stage) progress and/or speech types shift? 2) Does the phase-lag of head-nodding movements between the therapist and the client change as the therapeutic stages progress and/or speech types shift? This talk will report of some of the preliminary results of data analyses conducted to answer the former question.

Method of Data Collection: We recorded a counseling interview that was carried out by a student psychotherapist. We extend conventional data collection apparatus that are a video camera and microphones with uniquely developed head-mounted accelerometers. Thanks to the non-invasive characteristics of our sensor systems, we could keep natural dialogue atmosphere.

Analysis: The first investigation is on the differences of head nodding frequencies at different stages of the dialogue. In a past study, we found that there are different therapeutic stages in interview dialogue and they can be characterized by the occurrence patterns of speech types (Inoue et al., 2008). The use of the nodding by therapists can differ from stage-to-stage because different stages correspond to different roles in achieving therapeutic goals. The second investigation is on the degree of synchronization of head nodding between two participants. Therapists sometimes moved their head simultaneously with clients; while in some situations, there were delays in nodding. These differences may correspond to the task that the therapists have to conduct during the stages.

Discussion: In psychotherapy, non-verbal behavior such as nodding has been studied along with verbal behavior to certain degree. For example, the relationship between the amount of nodding and speech duration was experimentally examined (Matarazzo et al., 1964). In contrast to their approach, we explored natural therapeutic interviews and revealed the actual therapist's nodding patterns. In the future, the findings in this research can lead to the skill training methodology for the psychotherapists.

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The influence of limited mutual visibility condition on gestural and prosodic behaviour in task-oriented dialogues

Many observations and experiments prove that people tend to gesture during dialogue also when they do not see each other (Bavelas et al 2008). However, it was found that the quality of gestures of the dialogue parties changes with the limitation of mutual visibility. The visual aspect of dialogue behaviour in the limited visibility condition seems to be relatively well examined. In earlier experiments by other researchers, the participants have been asked to give directions to a location, to formulate opinions on movies or to give instruction how to fill a puzzle grid with a missing blocks. In the limited visibility condition, they were using an intercom or a telephone, or they were separated by a screen (Bavelas et al 2008). Less attention has been paid to the modifications to prosody due to the visibility conditions.

The aim of the present study is to give a detailed picture of how the visibility factor influences gestural behaviour and speech prosody of the parties in a specific category of task-oriented dialogues. The speakers are attributed the roles of the instruction giver and the instruction follower. The instruction giver can see a figure made of paper and her/his task is to instruct the instruction follower so that she/he can re-construct this figure using a provided sheet of paper and some additional artefacts. In the full visibility condition, the instruction giver and the instruction follower can see each other, while in the limited visibility condition they cannot. Two HDV camcorders are used to record the gestural behaviour of the participants. Their verbal behaviour is recorded using an independent audio recorder and two microphones (Jarmolowicz et al. 2007). From the recorded material, the realisations of selected instructing and feedback-providing dialogue acts are extracted and analysed both in terms of their gestural and prosodic realisation. At the present stage, our attention is focused solely on the instruction giver but future studies will also include instruction followers.

Firstly, we confront earlier results with the behaviour of our subjects in terms of the amount and the character of gestures. Secondly, we track how the prosodic component of multimodal utterances changes with the visibility, how it contributes to the meaning, how it synchronizes with gestures, and how it compensates for the lack of visual cues. In order to accomplish the former aim, the gestural behaviour of selected spans of dialogue is labelled and analysed in terms of gestural phrases and phases. In order to accomplish the latter, the prosodic properties of the selected utterances will be analysed in terms of subjective prominence and the prosodic focus as well as basic intonation-related parameters in the recordings from both types of sessions (visibility vs. lack of visual contact).

References

- Bavelas, J. B., Gerwing, J., Sutton, C., & Prevost, D. 2008. Gesturing on the telephone: Independent effects of dialogue and visibility. *Journal of Memory and Language* 58, 495–520.
- Jarmolowicz, E., Karpinski, M., Malisz, Z., Szczyszek, M. 2007. Gesture, Prosody and Lexicon in Task-oriented Dialogues: Multimedia Corpus Recording and Labelling. [In:] A. Esposito, M. Faundez-Zanuy, E. Keller, M. Marinaro (Eds.) *Verbal and Nonverbal Communication Behaviours*. Springer, pp. 99–110.

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Turn construction and simultaneous gestural matching

Simultaneous behavior has been viewed as one of the most interesting phenomena in social interactions. Lerner (2002) investigated the process underpinning matching gestures using conversation analysis. This study distinguished “achieved synchrony” from seemingly unintended synchronized behaviors and showed that matching gestures can emerge under two conditions: 1) “relaxed entitlement to voice the words that make up its turn,” and 2) “enhanced projectability” that enables understanding of the content of the subsequent action.

However, Lerner’s discussion is not sufficient for analyzing the gesture phrase and gesture unit. In this study, speeches, gestures, and gaze are transcribed using slightly modified version of system developed by Gail Jefferson (Sacks, et al., 1974) and Adam Kendon (Kendon, 2004) for understanding how matching gestures are produced.

This paper investigates a video depicting matching gestures to examine gestural coordination during conversation. This example was recorded from a conversation among three parties (Fig. 1). Parties B and C are telling Party A about the animated film they had watched before their meeting. Matching gestures in this example developed out of the relationship between B and C. This research focuses on: 1) how participants in multi-party conversations project and coordinate the timing and content of their gestures when gestures are exchanged simultaneously; and 2) functions other than those identified by Goodwin (1981) that contribute to the ability to construct a turn capable of including both knowing and unknowing recipients.

Goodwin (1981) showed that the ability of the speaker to design a turn that accommodates different types of knowledge about the event discussed was reflected in the speaker’s practice of shifting his or her gaze between knowing and unknowing recipients during speaking. This ability is useful for both constructing turns and for approaching particular structural problems that might affect participants.

Micro-analyses of matching gestures have revealed that participants mutually elaborate matching gestures by coordinating their body movements and making use of eye movements. The matching gestures investigated in this study revealed two additional functions of this practice: 1) the reproduction of their experience; and 2) the development of sympathy about the topic under discussion while the knowledge participations have about each other is validated.

Several of the matching gestures underscored two factors not mentioned by Lerner (2002): 1) that understanding the sizes, shapes, and ways of using objects plays a central role in enacting matching gestures by enhanced projectability on the basis of previous conversations; and 2) that controlling the micro-timing of the gesture phases in the gesture unit or phrase by monitoring the body movements of the other contributions to the achievement of matching gestures. We conclude that the process underlying matching gestures is not only complicated but also more important to the understanding of social interactions than is the goal of synchrony per se. We referred to the process that underpins the enactment of matching gestures before achieving synchrony as Simultaneous Gestural Matching to enhance the simultaneous organization of gestures by participants.

References

- C. Goodwin. *Conversational Organization: Interaction Between Speakers and Hearers*. New York: Academic Press, 1981.
- A. Kendon. *Gesture: Visible Action as Utterance*. Cambridge, 2004.
- Lerner, G. H. Turn-sharing: the choral co-production of talk-in-interaction. In C. E. Ford, B. A. Fox, and S. A. Thompson, (Eds.), *The Language of Turn and Sequence* (pp. 225–256). Oxford: Oxford University Press. 2002.
- H. Sacks, E. A. Schegloff, and G. Jefferson. A simplest systematics for the organization of turn-taking for conversation. *Language*, Vol. 50, No. 1, pp. 696–735, 1974

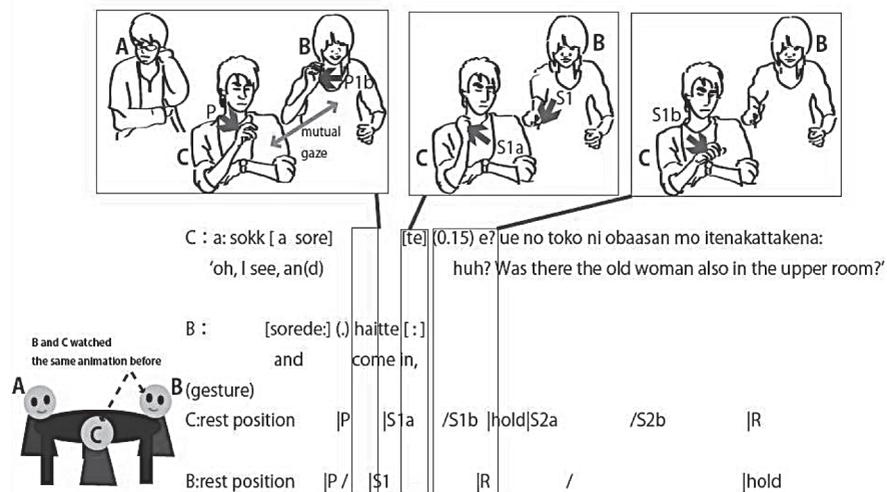


Figure 1 C repairs his gesture (S1b) and B holds her gesture slightly (retracting very slowly)

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Degree, not kind: Non-lexicalized points are symbolic indexicals regardless of whether they occur in the composite utterances of spoken languages or signed languages

Language is essentially embodied and the fundamental object of study for linguists, especially those that wish to compare signed languages (SLs) and spoken languages (SpLs), should thus be the composite utterance. A composite utterance is a turn in a face-to-face communicative exchange between two or more social interactants (Enfield, 2009). Composite utterances, whether signed or spoken, recruit three different types of symbolic units in the process of semiogenesis: conventional signs, non-conventional signs, and symbolic indexicals.

In this paper we argue that the non-lexicalized pointing signs found in deaf community SLs are no different from the pointing gestures found in the composite utterances of face-to-face SpLs. The pointing gestures of spoken interactants have simply been under-analysed or ignored in language description and linguistic theory, leading to an over interpretation of their role and status in SLs. Pointing signs and pointing gestures are both symbolic indexicals. (Symbolic indexicals are a hybrid of conventional signs and non-conventional signs and have elements which are partly conventional and partly contextual.) Any difference between SLs and SpLs in the use of symbolic indexicals, whether points or otherwise, is essentially one of degree, rather than kind.

With respect to kind, we support this claim by presenting an analysis of symbolic indexicals, especially points, from composite utterances in a SL corpus and then comparing them with examples from SpLs, as reported by Enfield (2009). This comparison suggests a fundamental underlying identity in the use of points in all composite utterances. With respect to degree, data is presented on the relative proportion of conventional signs and symbolic indexicals in the lexicons of SLs and SpLs. This is followed and supported by data on the frequency and distribution of the three types of symbolic units (conventional signs, non-conventional signs, and symbolic indexicals) found in composite utterances in sign or speech. The SL data is taken from a naturalistic corpus of native signers (>250 texts with >80,000 sign tokens). This is then compared to a variety of SpL texts. Together, both types of data suggest that what distinguishes SLs from SpLs—comparing appropriately composite utterances in both—is the much larger proportion of symbolic units in SL utterances that are symbolic indexicals compared to SpLs. (It is also significant that SLs have smaller overall lexicons of conventional signs.)

Contrary to the widely held view among SL linguists that pointing signs are grammaticalized conventional signs, we suggest that pointing signs in SLs remain gestural in nature or, to be more precise, are symbolic indexicals, just as they are in the composite utterances of spoken languages. They are not a fundamentally different kind of phenomena ('linguistic' pointing versus 'gestural' pointing) when they occur in signed languages.

References

Enfield, N. J. (2009). *The Anatomy of Meaning: Sign, gesture, and composite utterances*. Cambridge: Cambridge University Press.

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Teachers' multisemiotic repair practices in classroom interaction: Projecting dispreferred turns-of-action

This paper addresses the multisemiotic construction of teacher repair practices in classroom interaction. It sheds light on how the mediating role of the different pedagogical artefacts, such as transparencies or the blackboard, figures into the way teachers project their third turn evaluative actions as dispreferred; as initiating repair on students' inappropriate answers vis-à-vis the targeted responses (Seedhouse 2004). It also reveals how the linguistic and embodied design of teacher repair actions and the repair trajectory taken is contingent on the use of the different teaching materials and instruments as well as on the ongoing activity framework. Moreover, it will be argued that there is a particular 'third turn action opportunity space' within which teachers can perform different types of repair actions.

While earlier research on repair practices in classroom interaction has shown how teachers perform repair in and through the third turn of the tripartite instructional sequence of IRE (Initiation-Response-Evaluation, Mehan 1979; e.g. Lee 2007, Macbeth 2004, McHoul 1990), this paper demonstrates how teachers already during the student second turn response orient to the potential incorrectness of the answer and simultaneously manifest through multisemiotic means the forthcoming repair. A silence in the lieu of the third turn is similarly shown to be treated by students as projecting repair. This interpretation is shown to be invoked by the teachers' motionless gaze trajectory and body movement. The analysis therefore reveals that there are different, sequentially consecutive positions in which teachers can perform repair actions within the tripartite sequence. The potential realization of the different sequential positions is dependent on the pedagogical artefact used and the ongoing activity framework (i.e. what is the nature of the correct answer: a word or a longer phrase). The first such position is during the student second turn response. The analysis also shows how in such instances teachers in overlap with the student answer display their orientation to their forthcoming evaluative action, thereby showing orientation to two interactional tasks at the same time. The question that remains to be asked is what kinds of sociocognitive processes are at play in such instances?

The paper reports on the findings of my doctoral dissertation in which I examined teacher turn-allocation and repair practices from a multisemiotic perspective. The method used is conversation analysis combined with a Goodwinian (2000) view towards interaction as dynamically and reflexively constructed through a variety of semiotic means. The data material consists of 24 video recorded, naturally occurring classroom lessons, in which English is both the medium of instruction and object of learning. The repair data collection comprises of 37 repair sequences identified for closer analysis from classroom activities organized through the tripartite instructional sequence of IRE and mediated by a variety of teaching materials and instruments.

References

- Goodwin, C. 2000. Action and embodiment within situated human interaction. *Journal of Pragmatics*, 32(10), 1489–1522.
- Lee, Y-A. 2007. Third turn position in teacher talk: Contingency and the work of teaching. *Journal of Pragmatics*, 39(6), 1204–1230.
- Macbeth, D. 2004. The relevance of repair for classroom correction. *Language in Society*, 33(5), 703–736.
- McHoul, A. W. 1990. The organization of repair in classroom talk. *Language in society*, 19(3), 349–377.
- Mehan, H. 1979. *Learning Lessons. Social Organization in the Classroom*. Cambridge: Harvard University Press.
- Seedhouse, P. 2004. The Interactional Architecture of the Language Classroom: A Conversation Analysis Perspective. *Language Learning*, 54, supplement 1.

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Gesture as image event and visual argument (One case in cognitive rhetoric of gesture)

The rhetoric of gesture never ceases to attract scholarly attention. Thus, David McNeil and his colleagues inquired into the prosodic and narrative functions of gestures, and Cornelia Müller and her colleagues examined their metaphorical status. Gestures which accompany and assist speech have a clear rhetorical function: at the *elocutio* stage they express, illustrate, dramatize, spatialize and so on. However, if McNeil's "growth point" theory is correct and the production of gestures is inseparable from speech and thought, can gestures be detached from the stage of *inventio*, of the emergence of the idea? How do a topic's gestural potential and the speaker's gestural habits affect the way ideas are produced in the latter, affect the ideas themselves? After all, if thinking always arouses (unrealized) spatio-temporal and conceptual-actional schemata, some feedback must exist between them and thought fragments, and this feedback must be monitored (especially since the schemata and the idea are fragmentary, incomplete and unrealized at this stage). And if an (unexecuted) program of gesture arises together with a thought fragment, it must affect this or that fragment (especially because the objective of implementation has not been attained). In simple words, a gesture can, knowingly or unknowingly, be a speaker's motive and objective (in producing a complete rhetorical act, or part of one).

Here we examine a specific case: the effect of gesture on argumentation. It is quite likely that gestures can help not only in the expression, but also in the construction of arguments. Such a gesture, spontaneous or staged, will address the domain of visual argumentation in rhetoric; if it appears in the form of a snapshot or a drawing and is inserted into a newspaper article, for example, it would be defined as an image event (Deluca). I believe that a gesture which is represented verbally in a text can also be defined as an image event, because its cognitive processing will already contain its growth point and its full, framed mental representation. A (visual or verbal) gesture thus constitutes an image event and functions as part of a visual argumentation.

The question is, what part? What is its role in argumentation? How does visual argumentation with a gesture differ from visual argumentation without gesture? The clearest, although not the special, function of a gesture is to provide data, to use Toulmin's term. Toulmin makes the claim, fervently supported by Rorty as well, that an argument is never objective, but is based on the parties' agreement as to the backing assumptions. If this is the case, the essence and validity of an argument depend on the gesture's interpretation (at the warrant level) and the perception of its motives (at the backing level). As will be demonstrated in the analysis and by the examples, a gesture can motivate an argument, construct it, and even undermine and subvert it.

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The costs of switching between languages and modalities

This paper will report on the results of an experiment which tests the costs of switching languages for the unimodal and bimodal conditions. The languages used are English, German and German Sign Language (DGS). The purpose of this experiment is to establish a baseline of switching costs in bimodal language switching, which will be built upon in further experiments.

In speech, code-switching is when bilinguals switch from one language to another in conversation (e.g. Myers-Scotton 1997 etc.), and bimodal code-switching involves languages of different modalities, i.e. spoken and signed (Emmorey et al. 2008). Speakers who utilize bimodal code-switching, called bimodal bilinguals, switch between a spoken and a signed language. There are two populations of bimodal bilinguals: CODAs ('children of deaf adults': hearing native signers) and L2 signers (hearing people who learned the signed language as a second language). This experiment deals with L2 signers.

There has been little research on bimodal language switching, with most work coming from Emmorey and her colleagues, who study American Sign Language (ASL) and English (Emmorey et al. 2005, 2008). In their 2008 paper, Emmorey et al. found that most bimodal language mixing actually appears in the form of simultaneous blending, called code-blending, rather than sequential code-switches. However, while their work mentions switching costs, there is no empirical analysis of these costs. Also, it has been established that in L2 populations, there are differing costs for switching to the L1 versus the L2 in spoken language production (Meuter and Allport 1999). This experiment will take into account modality in assessing this asymmetry. A further issue is inhibition, whereby a bilingual speaker must inhibit one language in order to produce the other; switching costs result from this inhibition (Green 1986, 1998) in addition to general switching costs. Inhibition effects are also unequal for the spoken L1 and L2 (Philipp et al. 2007), but bimodal inhibition effects are little studied: Emmorey and colleagues (e.g. 2008) mention it, but there is no empirical analysis of this phenomenon. The data from this research will help to fill these gaps.

Interestingly, Emmorey and her colleagues (Emmorey 2008, Casey and Emmorey 2008) found that code-blends pattern like co-speech gesture and seem to take their place in the speech of CODAs. This work will contribute to the research on bimodal bilingual speech as well as co-speech gesture by establishing a baseline for comparison in terms of costs and inhibition. Generally, the results of this experiment will increase our knowledge of: 1) the costs of modality switching in language switching; 2) asymmetry among languages of differing modalities in terms of costs and inhibition; and 3) models of mental and functional representation of spoken and signed languages as well as co-speech gesture.

References

- Casey, S. and Emmorey, K. (2008) Co-speech gesture in bimodal bilinguals, *Language and cognitive processes*, 24, 290–312.
- Emmorey, K., Borinstein, H. B., Thompson, R. and Gollan, T. H. (2008) Bimodal bilingualism, *Bilingualism: Language and Cognition*, 11, 43–61.
- Green, D. W. (1998) Mental control of the bilingual lexico-semantic system, *Bilingualism: Language and Cognition*, 1, 67–81.
- Meuter, R. F. I. and Allport, A. (1999) Bilingual language switching in naming: Asymmetrical costs of language selection, *Journal of Memory and Language*, 40, 25–40.
- Philipp, A. M., & Koch, I. (2009) Inhibition in language switching: What is inhibited when switching among languages in naming tasks?, *Journal of Experimental Psychology: Learning, Memory & Cognition*, 35, 1187–1195.
- Philipp, A. M., Gade, M., and Koch, I. (2007) Inhibitory processes in language switching: Evidence from switching language-defined response sets, *European Journal of Cognitive Psychology*, 19, 395–416.

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Time course of speech-gesture integration in comprehension: Insights from gating experiments

It has become clear in the literature that the listener/viewer integrate information from speech and gesture to derive a unified representation of what the speaker/gesturer's tries to convey (see Kendon, 1994 for a review). However, the exact time course of how the listener/viewer integrates information is not well understood.

The current study investigated the time course of how the listener/viewer integrates information from speech and gesture in two experiments, using the "gating paradigm" (Grosjean, 1996). The stimuli consisted of three types of video clips: those with a spoken verb (e.g., to rotate) and an iconic gesture (a circling hand depicting rotation) (multi-modal condition), those with just a spoken verb (audio-only condition), those with just a gesture (visual-only condition). Participants were first presented with the initial part of a video clip (the first "gate"), and then with successively longer clips (the second, third, .. twelfth gates). Each gate is 40 msec (1 video frame) longer than the preceding gate, except for the last twelfth gate, which presented the entire gesture and verb. In Experiment 1, the participants were asked to recognise the verb in the multimodal and audio-only conditions. In Experiment 2, the participants were asked to indicate the meaning of the gesture in the multimodal and visual-only conditions. It was found that multimodal presentation facilitated word recognition and gesture interpretation (Experiments 1 and 2). Furthermore, multimodal presentation initially increased the number of candidate word types (Experiment 1), but it did not increase the number of candidate gesture interpretation types (Experiment 2). The results indicate that gesture and speech are incrementally integrated with each other, with qualitatively different consequences for each modality initially. That is, at the initial phase of word recognition, gesture "perturbs" the word recognition system by add more candidate words. This may contribute to a faster convergence on the target word as the larger set of candidate words is more likely to contain the target word. Interesting, speech did not cause such early perturbation in gesture interpretation. The speech narrowed down gesture interpretation in a linear manner. This may be due to inherently ambiguous nature of gestural representation (Krauss, Morrel-Samuels, & Colasante, 1991).

References

- Grosjean, F. (1996). Gating. *Language and Cognitive Processes*, 11(6), 597–604.
- Kendon, A. (1994). Do gestures communicate: a review. *Research on Language and social interaction*, 27, 175–200.
- Krauss, R., M., Morrel-Samuels, P., & Colasante, C. (1991). Do conversational hand gestures communicate? *Journal of Personality and Social Psychology*, 61, 743–754.

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Four-year old children segment and linearize information in a silent gestural communication task

A study of Nicaraguan Sign Language, a language created and developed by deaf children without substantive linguistic input from adults, provided evidence that pre-adolescence children have tendency to make a communication system more linear and segmented (Senghas, Kita, & Özyürek, 2004). Senghas and colleagues studied how the expression of manner and path of motion events in Nicaraguan Sign Language changed over the first 20 or so years since the inception of the language. It was found that successive cohorts of children transformed representations of motion events from more a holistic format (manner and path expressed in a single sign) to a linear and segmented one (manner and path expressed in separate signs) and this change in the language did not spread to NSL signers who were in their adolescence or older. This suggests that the tendency to linearise and segment information is specific to pre-adolescent children. The study, however, leaves open to the question as to whether or not this tendency was specific to the Nicaraguan situation or general to all children.

The current study investigated whether a typically developing population in England show the same tendency. We presented short animated clips, depicting events with manner and path of motion, to 37 four-year olds (M=4.5 years), 28 adolescents (M=12.4 years) and 35 adults (M=21.5 years). We instructed our participants to express what they saw in the clips with gestures, but without speaking. The proportion of gestural expressions that segmented and combined the semantic elements (manner and path) into segmented and linear sequences vs. those expressing them simultaneously were compared across age groups. It was found that, compared to adolescents and adults, children had a stronger tendency to segment manner and path information into separate gestures, and then combining them into linear sequences. The results from two additional control tasks ruled out the possibility that segmented and linearised gestures reflected limited motor maturation or event perception. Taken together, we conclude that young children possess tendencies to segment information and linearise segmented information in communication.

The finding of the current study, along with the one from Nicaraguan Sign Language (Senghas, et al., 2004), suggest that linear and segmented nature of human language may at least partly derive from a tendency that is intrinsic in how young children represent information for communication. Furthermore, the results also further support the idea that pre-adolescence children are a crucial driving force of grammatical innovation and change in language (Senghas & Coppola, 2001). It also dovetails with studies of home signs (a communication system created by a single deaf child in a hearing family), which showed that a child can create a communication system with language-like properties on their own (Goldin-Meadow, 2003).

References

- Goldin-Meadow, S. (2003). *The resilience of language: What gesture creation in deaf children can tell us about how all children learn language*. New York: Psychology Press.
- Senghas, A., & Coppola, M. (2001). Children creating language: How Nicaraguan Sign Language acquired a spatial grammar. *Psychological Science*, 12, 323–328.
- Senghas, A., Kita, S., & Özyürek, A. (2004). Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science*, 305, 1779–1782.

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“Singing with the hands” – Curt Sachs and the contemporary relevance of Ancient Egyptian Chironomy

Curt Sachs (1881-1959), the eminent German-Jewish musicologist was the first modern historian to extensively comment on the music of Pharaonic Egypt, which has left behind numerous depictions of music-making, but neither fragments of musical notation nor detailed theoretical treatises. While Egyptologists of later generations often discarded Sachs pioneering studies, his interpretation of chironomy – the signifying gestural expression of sound through the movement of hands and arms – deserves a critical second look. Referring to visual and linguistic evidence on the Egyptian musician’s chironomic definition of singing as “making music with the hands” Sachs observes:

“The participation of the body in music-making, which manifests itself up to today in the swaying of the head while listening to a pleasant tune, is the more evident, the more the art of music is still connected to its origins. Primitive people are hardly capable to suppress movements while singing. All indicative and imitating motions are an overall part of expressive movements, which according to Wundt are firmly associated with our emotions. Like the act of singing they are a physical unleash of emotional tension and only gradually these originally instinctual movements were transformed into intentional ones.” [my translation]

This psychologically informed treatment of the visualisation of motion is not only related to the transdisciplinary interests of turn-of-the-century cultural historians and theorists such as Aby Warburg or Georg Simmel, but also gains new credibility in the light of recent neuropsychological research on the relationship between physical and musical motion. Neil McAngus Todd has for instance proposed a differentiation between a primarily gestural and a tempo-associated locomotive musical motion, which in analogy to the motor theory of speech presumes a virtual image and representation of motion.

In this vein the paper seeks to trace the sources which shaped Sachs ideas (Wundt’s concept of “Ausdrucksbewegungen”, evolutionary theories and contemporary studies of reflexes and their visualisation) and to situate them within current debates on the cultural relevance of scientific concepts for an integrative 21st century scholarship.

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“It has a certain [gesture]” – Syntactic integration of gestures into speech

When people are engaged in a conversation, they speak and also gesture in order to communicate. Not only can gestures be used to point at people or objects (Bühler 1934) but, like speech, they can also represent things in the world (Müller 1998). Furthermore, gestures can be used as speech substitutes (Ekman & Friesen 1969, Wundt 1900). For the most part, emblematic and deictic gestures have been studied with regard to this function. Findings show that both types of gestures can substitute words or whole utterances (e.g. Ekman & Friesen 1969, Fricke 2007, Kendon 1988, Louwerse & Bangerter 2005 *inter alia*). Only a few studies on gestures conducted from the perspective of Conversation Analysis mention the use of iconic gestures to complete utterances (Bohle 2007, Streeck 1993).

The paper to be presented shows first results of a study (Ladewig in prep.) that systematically examines the use of gestures in syntactic gaps from the point of view of a multimodal grammar (Fricke 2008). It is based on 20 hours of video-recorded German discourse, i.e. naturally occurring conversations, parlor games as well as TV shows.

The data reveal that not only emblems or recurrent gestures are used as speech substitutes but, first and foremost, iconic gestures are used to perform this function. Furthermore, this study shows that gestures are not integrated randomly but follow the underlying syntactic structure of verbal utterances (cf. Fricke 2008). Accordingly, gestures can be linearly or synchronically combined with a demonstrative or an indefinite pronoun, a deictic particle or an adjective, and thereby substitute constituents such as verbs/verb phrases, or nouns/noun phrases. Thus, gestures are able to adopt syntactic functions (Fricke 2008).

The study puts forward a linguistic approach to gestures (see e.g., Bressems & Ladewig *fc.*, Fricke 2008, Ladewig & Bressems *subm.*, Müller 1998) and takes another step towards identifying the principles that govern a multimodal grammar (Fricke 2008).

References

- Bohle, U. (2007). *Das Wort ergreifen – Das Wort übergeben. Explorative Studie zur Rolle redegleitender Gesten in der Organisation des Sprecherwechsels*. Berlin: Weidler Buchverlag.
- Bressems, J. & S.H. Ladewig (forthcoming). Rethinking gesture phases – articulatory features of gestural movement?, *Semiotica*.
- Bühler, K. (1934/1982). *Sprachtheorie. Die Darstellungsfunktion der Sprache*. Stuttgart, New York: Fischer.
- Ekman, P. & W.V. Friesen (1969). The Repertoire of Nonverbal Behavior: Categories, Origins, Usage, and Coding. In: *Semiotica* 1, 49–98.
- Fricke, E. (2007). *Origo, Geste und Raum – Lokaldeixis im Deutschen*. Berlin: de Gruyter.
- Fricke, E. (2008). Grundlagen einer multimodalen Grammatik des Deutschen: Syntaktische Strukturen und Funktionen. Habilitation, Europa-Universität Viadrina, unpublished manuscript.
- Kendon, A. (1988). How gestures can become like words. In: F. Poyatos (Ed.) *Cross-cultural perspectives in non-verbal behavior*. Toronto: C.J.
- Ladewig, S.H. & J. Bressems (submitted). Discovering structures in gestures based on the four parameters of sign language.
- Ladewig, S.H. (in preparation). “It has a certain [gesture]” – Syntactic and semantic integration of gestures into speech. PhD thesis.
- Louwerse, M.M. & Bangerter, A. (2005). Focusing attention with deictic gestures and linguistic expressions. Bara, B., Barsalou, L. and M. Bucciarelli (Eds.), *Proceedings of the Cognitive Science Society* (pp. 1331–1336). Mahwah, NJ: Lawrence Erlbaum.
- Müller, C. (1998). *Redegleitende Gesten. Kulturgeschichte – Theorie – Sprachvergleich*. Verlag Arno Spitz: Berlin.
- Streeck, J. (1993). Gesture as Communication I: Its Coordination with Gaze and Speech. In: *Communication Monographs* 60 (4): 275–299.
- Wundt, W. (1900). *Völkerpsychologie: eine Untersuchung der Entwicklungsgesetze von Sprache, Mythos und Sitte. Bd. 1, Die Sprache, Teil 1*. Leipzig: Engelmann.

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Popular television and cultural behavior: Mexican Spanish and Iraqi-Gulf Arabic

We believe that the study of dramatic interpretations (plays, cinema, and television) of dyadic interaction has the potential to suggest useful avenues for analyses of natural, unrehearsed, multimodal social interaction. We report on a comparison of dyadic discourses from two sources: (1) a corpus of videotaped, unrehearsed, story-telling discourses in Mexican Spanish and Iraqi Arabic, elicited using the Pear Film (Wallace Chafe 1980) and (2) sequences from recently produced, televised soap operas in Spanish and Arabic, produced in Mexico and Iraq, that are currently being aired in and outside those two countries. We compared the acted to natural unrehearsed spoken and nonverbal behaviors in both groups. We predict that culturally distinctive, verbal and nonverbal interactive behaviors that may be too fleeting or subtle to be readily observed in natural discourse may be accentuated and thus more noticeable in acted discourse. Here we will focus primarily on differences we observed in listener nonverbal behaviors (e.g., facial expression, posture, gestural backchannel) in these two discourse genres, in the two language/cultural groups. We will also discuss aspects of spoken language that vary from region to region, within Mexico and within the Gulf-regional Arabic-speaking realm.

The unrehearsed, natural interactive discourses were collected from native speakers from the two language/cultural groups, who had not spent significant time outside of their countries of origin. The corpus consisted of Pear Film narrations from 36 Iraqi dyads and 27 Mexican dyads. Our corpus of soap opera discourses consisted of a selection of contemporary soap operas available via youtube.

Comparing acted with natural dialog, within a language/cultural group, we found the genres to be closely related in terms of phenomena expressive of regional dialect variation. We observe that discourse on screen and in ‘real’ life mutually constitute elements of one another. That is, the range of behaviors is highly similar, seeming to differ mainly, as predicted, in degree of accentuation or exaggeration. For example, Mexican actors in telenovelas tend to exhibit exceedingly still, staid facial expressions as listeners. We found that this was also true for the majority of the 27 Mexican-Spanish Pear Film dyads. As listeners, Iraqi actors in a popular miniseries exaggerate brow lowerers (FACS Action Unit 4) (Ekman & Friesen, 1978) as a nonverbal backchannel behavior. We observed the very same nonverbal behavior, in much subtler forms, in our 36 Iraqi-Arabic Pear Film dyads.

We will discuss the benefits, for cross-cultural studies of natural interaction, of comparisons of the sort we have carried out, between acted and natural(istic) forms of dialog. Further, we briefly discuss the socio-cultural context of Mexican and Iraqi soap operas. Our explorations of them suggest that the proliferation of Mexican and Iraqi drama through global media, like satellite television and internet sites such as youtube, may work to reinforce cultural identities domestically with a national audience and internationally with satellite cultural pockets of people who identify as Mexican or Iraqi.

References

- Abu-Lughod, Lila (2005). *Dramas of Nationhood*. Chicago: The University of Chicago Press.
- Adorno, Theodor W. (1991) *The Culture Industry*. London: Routledge.
- Chafe, Wallace (ed.), (1980). *The Pear Stories: Cognitive, Cultural, and Linguistic Aspects of Narrative Production*. Norwood, New Jersey: Ablex.
- De Saussure, Ferdinand. [1996] *Course in General Linguistics*. (Ed. by Ch. Bally, A. Sechehaye, A. Riedlinger; trans. by W. Baskin). New York: McGraw-Hill, 1996.
- Ekman, Paul, Friesen, Wallace (1978). *Facial Action Coding System: A Technique for the Measurement of Facial Movement*. Palo Alto: Consulting Psychologists Press..
- Metz, Christian (1991). *Film Language*. Chicago: The University of Chicago Press.

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Gesture, prosody and structural segmentation in Brazilian Sign Language

For both methodological and theoretical reasons, questions concerning the relation of gesture to grammar have only fairly recently begun to constitute a coherent research agenda. Sign language linguistics may occupy a particularly important role for studies in this area, owing to the modal proximity of what traditionally is considered gestural versus what is best considered verbal: how do signers blend discrete/sequential/combinatorial features with gradient/simultaneous features to produce a thoroughly visual-gestural natural language? Within this research domain, the specific purpose of the study reported on here has been to identify the formal resources employed by signers to segment the flow of signed discourse into information packages, assuming that such segmentation is fundamental for both our cognitive and social life (Langacker, 2001; Sacks, Schegloff and Jefferson, 1974). Data were taken from semi-spontaneous conversations between pairs of deaf friends, primary users of Brazilian Sign Language, left to converse in the absence of the investigator. Analysis was done on the basis of the video record, transcribed using ELAN, controlling for eye gaze and eyeblinks, body and head movement, and, most crucially, demarcation of the gesture phases (McNeill, 1992; Kita et al, 1997) for each manual sign and non-sign gesture. The search for the markers of discourse segmentation proceeded from the analysis of simpler, single-unit turns, to increasingly complex yet still highly structured turns, such as lists (Jefferson, 1990) and contrasts (Atkinson, 1984). Results show that gestural modulations of signs, along with eye-gaze, body and facial expression, are all implicated in the process of segmenting sign language discourse into minimal coherent language chunks. Moreover, these results suggest the view that prosodic resources in spoken languages (e.g. patterns of acceleration-deceleration, pause, accent, intonation, rhythm) may be profitably approached as gestural operations on discrete/sequential linguistic elements for such purposes as discriminating prominent from non-prominent information (Bolinger, 1983).

References

- Bolinger, D. L. 1983. Intonation and gesture. *American Speech*, 58: 156–174.
- Kita, S.; van Gijn, I.; van der Hulst, H. 1997. Movement phases in signs and co-speech gestures, and their transcription by human coders. *Proceedings of the International Gesture Workshop*. Bielefeld, Germany, September, 17th–19th, p. 23–35.
- Langacker, R.W. 2001. Discourse in cognitive grammar. *Cognitive Linguistics*, 12: 143–188.
- McNeill, D. 1992. *Hand and mind*. University of Chicago Press.
- Sacks, H.; Schegloff, E.A.; Jefferson, G. 1974. A simplest systematics for the organization of turn-taking for conversation. *Language*, 50: 696–735.

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Context is everything when learning to gesture in another language

Numerous studies have demonstrated that native speakers of Spanish and English differ in terms of how motion events are expressed in speech and in gesture and thus result in varied Thinking for Speaking patterns (Berman & Slobin, 1994; Kellerman & van Hoof, 2003; McNeill, 1998; McNeill & Duncan, 2000; Negueruela, Lantolf, Jordan, & Gelabert, 2004; Slobin, 1991, 1996a, 1996b, 2003; Stam, 1998). Within these studies, some researchers have gone a step further and have affirmed that learners of a second language do not necessarily adapt their Thinking for Speaking patterns when speaking the second language. Learners by and large tend transfer their first language Thinking for Speaking pattern to their second language. This presentation presents evidence that second language learners studying in the target language country can actually acquire a new Thinking for Speaking pattern but only over time. Data from one native speaker instructor and six study abroad students studying for one year at the University of Barcelona were collected for this project. The observations include two datasets carried out in distinct spontaneous discourse settings: in a formal setting and in an informal setting. The datasets were transcribed and coded for speech and gesture before being analyzed for the path component of motion events quantitatively as well as qualitatively. The data indicate that learners appear to acquire the correct use of second language gesture patterns related to path and make use of them more frequently as time goes on. Moreover, the findings support the notion that there are considerable linguistic benefits to study abroad that include more than just second language verbal developments; they also consist of the subtler aspects of language such as second language gesture usage.

References

- Berman, R. A., & Slobin, D. I. (1994). *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.
- Kellerman, E., & van Hoof, A.-M. (2003). Manual accents. *International Review of Applied Linguistics*, 41(3), 251–269.
- McNeill, D. (1998). Speech and gesture integration. *New Directions for Child Development*, 79(Spring), 11–27.
- McNeill, D., & Duncan, S. D. (2000). Growth points in thinking-for-speaking. In D. McNeill (Ed.), *Language and gesture* (pp. 141–161). Cambridge: Cambridge University Press.
- Negueruela, E., Lantolf, J. P., Jordan, S. R., & Gelabert, J. (2004). The private function of gesture in second language speaking activity: a study of motion verbs and gesturing in English and Spanish. *International Journal of Applied Linguistics*, 14(1), 113–147.
- Slobin, D. I. (1991). Learning to think for speaking: Native language, cognition, and rhetorical style. *Pragmatics*, 1, 7–26.
- Slobin, D. I. (1996a). From “thought and language” to “thinking for speaking”. In J. J. Gumperz & S. C. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 70–96). Cambridge: Cambridge University Press.
- Slobin, D. I. (1996b). Two ways to travel: Verbs of motion in English and Spanish. In M. Shibatani & S. A. Thompson (Eds.), *Essays in syntax and semantics* (pp. 195–219). Oxford: Oxford University Press.
- Slobin, D. I. (2003). Language and thought online: Cognitive consequences of linguistic relativity. In D. Gentner & S. Goldin-Meadow (Eds.), *Language in mind: Advances in the study of language and thought* (pp. 157–192). Cambridge, MA: MIT Press.
- Stam, G. (1998). Changes in patterns of thinking about motion with L2 acquisition. In S. Santi, I. Guaitella, C. Cavé & G. Konopczynski (Eds.), *Oralité et gestualité: Communication multimodale, interaction* (pp. 615–619). Paris: L'Harmattan.

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What do primate gestures tell us about the evolution of language?

Language is multimodal. However, theories of language evolution usually argue for either a gestural or a vocal and thus a unimodal origin of language. Many of these consider evidence from comparative research on non-human primate communication and the corresponding theories are discussed in the light of the absence or presence of certain linguistic precursors in the opposing modality. Here we summarize the current evidence emerging from studies of gestural communication and compare it with research on primate facial and vocal communication. This is based on a systematic review of the literature on primate communication from the past 40 years. It impressively indicates that researches on vocal, gestural and facial behaviours have very different theoretical and methodological approaches. As a result, comparisons of communicative patterns across modalities are problematic. Therefore, a multimodal approach to primate communication is not only essential to cover the species' communicative repertoire but also to understand how the different modes of communication interact with and influence each other. Only by examining communicative signals of different modalities can we both avoid methodological discontinuities and gain a better understanding of the phylogenetic precursors to human language as part of a multimodal system.

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From gesture to word and from gesture to sign: Pointing and personal pronouns between the ages of 1 and 3 in French and French Sign Language

Among the conventional gestures observed in hearing children's development, pointing appears between 9 and 12 months, shortly before first words. This gesture enables children to designate an object as a focus for joint attention. Through pointing and gazing, it takes on a special status and stands out from its environment (Bruner 1983). Pointing can therefore be one of children's first symbolizing devices in the joint attentional frame described by Tomasello (1999).

For Clark (1978), early demonstratives follow pointing as children shift rather fluidly from pre-linguistic to linguistic communication. Pointing would thus correspond to a transition process in the course of acquisition, facilitating access to combinations and early syntax (Goldin-Meadow & Butcher 2003; Volterra et al. 2005). However, gestural communication does not totally disappear with the emergence of vocal productions and is still largely used by adults themselves in combination with vocal productions (Guidetti 2003).

Now, do visual-gestural and audio-vocal modalities mark the same linguistic prerequisites? Such continuity between pointing gestures and language is questioned by Bellugi & Klima (1981) and Petitto (1986), based on their observations of discontinuity and pronominal inversions in deaf signing children. Children's pre-linguistic gestures would thus be different from signs despite the same hand-shape.

In this paper, we explore the issue of (dis)continuity between gestures and words/signs and analyze the data taken from two longitudinal follow-ups of a child acquiring French and a child acquiring French Sign Language between ages seven months and three, who were filmed monthly at home with their parents. We extract and categorize all pointing gestures and personal pronouns in order to analyze their values in context.

Our first analyses show three important features. 1) The deaf child uses much more pointing overall than the hearing child. She also produces quite a lot of pointing towards her interlocutor where the hearing child produces very little, and some self-pointing where the hearing child uses none at all. The modality of the input – French Sign Language, in which pointing gestures are grammaticalized as deictic signs, versus spoken French – may influence the amount and target of pointing gestures. 2) The hearing child uses more pointing gestures when her MLU is below 2.5, but she still largely uses them at the age of three when her MLU is 5 and over. Pointing gestures are therefore still functional for her once she has developed higher linguistic skills. 3) We found no evidence of discontinuity in the deaf child's production of pointing to self or other. There is no brutal stopping nor any reversals in our data. Our analyses do not enable us to differentiate pointing "gestures" from pointing used as linguistic signs. However, pointing is increasingly combined with other signs, facial expressions and/or gaze in complex linguistic productions and with deictic and anaphoric values.

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A semantic account for iconic gestures

Co-verbal iconic gestures carry information, that is, they have semantic significance (Turvey & Carello, 1985). But how do they accomplish that? Traditionally, with reference to the work of C.S. Peirce (1867), icons are said to be meaningful due to a resemblance of the sign – the performed gesture, in this case – with its referent. However, there are good reasons that resemblance is an all too vague and slippery notion to build a sign relation on it. In particular, 1) the sign relation and the resemblance relation have different properties; 2) resemblance is resemblance with respect to a *tertium comparationis*, which could be general to such an extent that resemblance becomes a vacuous term; 3) the interpretation of any iconic sign involves a good deal of conventional knowledge, that is used to establish the referential connection between the icon and its object in the first place. (Cf. Eco, 1967; Biermann, 1962). Reasons enough to watch for some alternative mechanism of “iconic meaningfulness”.

Trying to interpret iconic gestures in isolation, we are thrown back on guessing which predicates might apply to the perceived body movement. This interpretation endeavour advises that it is not the iconic gesture that denotes an object, but that in fact the gesture is the object that gets denoted. The denotation relation is just reversed. A reversed denotation relation is well-known in semiotics, it is Goodman’s (1976) exemplification relation. Accordingly, I argue that the semantics of iconic gestures should be modelled in terms of exemplification.

Furthermore, the meaning of a co-verbal iconic gesture depends on its linguistic affiliate: One and the same body movement may get a quite different interpretation when interpreted, say, in the context of a noun (e.g., depicting shape) or a verb phrase (e.g., depicting a path). In order to model this kind of context sensitivity, the context-free interpretation of a gesture has to be ontologically neutral. Following semantic work on space-related prepositional phrases (Zwarts, 1997), I accomplish that by interpreting gestures in terms of vectors: The gesture annotation gets translated into a vector-based description. Exemplification, then, is modelled as a satisfaction relation between the gesture vector and the denotation of space-related predicates.

Additionally, iconic meaning may square to verbal meaning or fail to do so. Thus, there have to be some semantic well-formedness criteria obtaining for the integration of gestural and verbal information. Especially the latter fact urges to model the integration of speech and gesture within grammar theory, since it is not only a semiotic, but also a linguistic subject.

Putting the three lines of reasoning together, I present a semantic account for iconic gestures based on exemplification. Exemplification is implemented as a semantic mode within a unification-based grammar framework. A grammar interface is sketched that, among others, captures well-formedness conditions for the integration of speech and gesture. Some examples will illustrate how the account works.

References

- Biermann, A.K. (1962). That There Are No Iconic Signs. *Philosophy and Phenomenological Research*, 23(2), 243–249.
- Eco, U. (1976). *A Theory of Semiotics*. Bloomington: Indiana Univ. Press.
- Goodman, N. (1976). *Languages of Art. An Approach to a Theory of Symbols*. Indianapolis: Hackett.
- Peirce, C.S. (1867). *On a New List of Categories*. *Proceedings of the American Academy of Arts and Sciences Series*, 7, 287–298.
- Turvey, M.T. & Carello, C. (1985). The Equation of Information and Meaning from the Perspective of Situation Semantics and Gibson’s Ecological Realism. *Linguistics and Philosophy*, 8, 81–90.
- Zwarts, J. (1997). Vectors as Relative Positions: A Compositional Semantics of Modified PPs. *Journal of Semantics*, 14(1), 57–86.

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Introducing the Bielefeld SaGA corpus

The Bielefeld Speech and Gesture Alignment (SaGA) corpus is a collection of multimodal communication. Speakers’ task was a combination of direction-giving and sight description whereby the scenario invoked participants to convey information about objects and spatial relations between them. The stimulus is an artificial town presented in a Virtual Reality environment, affording experimental control for the content of speaker messages. We collected audio and video data as well as body movement and eye-tracking data from the speakers. In total, the SaGA corpus consists of 280 minutes of video material containing 4961 iconic/deictic gestures, approximately 1000 discourse gestures and 39,435 words. To our knowledge, this is by far the largest and most comprehensive collection of naturalistic, yet controlled, and systematically annotated speech-gesture data currently available.

To develop a detailed account of how speakers use gestures in combination with speech under contextual constraints, data coding comprises gesture segmentation (preparation, stroke, retraction, holds), classification (iconic, deictic, etc.), representation techniques (e.g., drawing, placing) and morphological features (e.g., handshape, palm orientation, trajectories). Based on a transcription of the spoken words, the dialogue context information is coded in terms of DAMSL dialogue acts, information focus, disfluencies etc.. A subpart of the corpus has additionally been annotated for the gestures’ referents and their spatio-visual properties (dimensionality, symmetries, profiles, etc.). Data coding is based on an annotation grid we developed according to theoretical considerations and refinement.

The corpus has been evaluated by means of reliability assessments, indicating on which annotation layers coders share a common understanding of the phenomena in question and are able to annotate them consistently, and on which layers agreement is difficult to achieve. Since the SaGA corpus comprises data of two different qualitative statuses, viz. Type I and Type II (Gwet, 2001), its evaluation was done by respective agreement measures. The results not only indicate the reliability level, they also point to the most interesting, that is less agreed-upon, data partitions. These annotation layers are in particular subject of our ongoing development of semi-automatic annotation tools based on motion tracking data.

Up to now, SaGA is used to shed light on open research questions of speech and gesture use from different methodological perspectives: the specification of an interpretive domain ontology for gestures accompanying noun phrases (Rieser, 2008), the application of machine learning techniques which enable novel insights into the production process of iconic gestures (Bergmann & Kopp, 2009), and being input for assessments of speech and gesture alignment (Lücking et al., 2008). SaGA, thus, is a valuable data pool for empirically exploring the interplay of speech and gesture on different layers of multimodal dialogue: it spans the range from the motivation of gesture production by features of the thing to be depicted over cross-modal syntactic-semantic regularities to dialogue management.

References

- Bergmann, K., & Kopp, S. (2009). gNetIc–Using Bayesian Decision Networks for Iconic Gesture Generation. In Z. Ruttkay et al. (Eds.), *Proceedings of IVA 2009* (pp. 76–89). Berlin: Springer.
- Gwet, K. (2001). *Handbook of Inter-Rater Reliability*. Gaithersburg, MD: STATAXIS Pub. Comp.
- Lücking, A., Mehler, A., Menke, P. (2008). Taking Fingerprints of Speech-and-Gesture Ensembles: Approaching Empirical Evidence of Intrapersonal Alignment in Multimodal Communication. In J. Ginzburg et al. (Eds.), *Proceedings of SemDial 2008* (pp. 157–164).
- Rieser, H. (2008). Aligned iconic gesture in different strata of mm route-description dialogue. In J. Ginzburg et al. (Eds.), *Proceedings of SemDial 2008* (pp. 157–164).

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From parts of body to parts of speech

In this talk we examine strategies of the encoding of specific types of gestures and involuntary body motions in linguistic expressions in German, so-called kinetic idioms ('Kinegramme', 'Somatismen') in terms of Burger (1976). We show that powerful generalizations can be derived as to how descriptions of motions of body parts, the volitionality of these motions, and grammatical properties of the verbs used in the descriptions interact. Our research is based on a corpus study investigating 28 types of kinetic idioms. Approximately 15,000 sentences were sampled from the COSMAS Corpus of the IDS Mannheim (3,6 billion words).

Stereotypical idiomatic expressions display a potential ambiguity between a conventionalized non-compositional idiomatic meaning and a compositional literal meaning. The literal meaning, however, is seldom expected to surface (cf. Langlotz 2006).

Burger (1976) shows that kinetic idioms form a remarkable class of their own. As opposed to stereotypical idioms, kinetic idioms typically also trigger the literal interpretation. "den Kopf schütteln" (to shake one's head) refers to the gesture of denial, as well as to the mere motion of the head. Burger (2007) relates this marked behaviour to the complex semi-otic structure of kinetic idioms: They are verbal expressions referring to body movements that are itself ambiguous between a conventionalized gesture and a simple physical action.

In our empirical study, we found that Burger's kinetic idioms behave in remarkable ways in further respects. The 28 idioms under investigation follow a narrow variety of strategies of grammatical encoding. They are either constructions containing a verb selecting a direct object nominal phrase (NP) with accusative case, or a verb selecting an oblique prepositional phrase (PP) headed by 'mit' (with) like "mit den Augen zwinkern" ("to blink with one's eyes"). Considering the rich constructional options in natural languages, such narrowness is rather unexpected.

To explain for this we must reconsider the nature of the body movements described by kinetic idioms. Contradicting Burger, the results of our corpus study define a sharp distinction between kinetic idioms referring to intentional gestures and those referring to involuntary body motions. As can be shown, gestures are mostly encoded by verbs selecting an accusative NP or by an unergative verb selecting a 'mit'-PP. However, involuntary motions tend to be realized by unaccusative verbs, as in "mir schlottern die Knie" ("me shake the knees"). Only in marked cases, these motions are encoded by intransitive predicates with a 'mit'-PP. This is due to the existence of more salient constructions, cf. Wegener (1990).

Our findings thus lead to the conclusion that, likely due to the dominant role played by gestures in every-day communication, language has developed narrow ranges of highly grammaticalized constructional patterns to encode such gestures.

Our research offers potential for further cross-linguistic research. For example, English also has a specific construction to realize kinetic idioms, namely verb phrases with an obligatorily bound prenominal genitive, as in "clap one's hands". Furthermore, degrees of grammaticalization of gestures in other languages could be further investigated, offering perspectives for intercultural studies.

References

- Burger, H. (1976): 'die achseln zucken'- zur sprachl. kodierung nicht-sprachl. kommunikation. *Wirkendes Wort* 26, 311–334.
- Burger, H. (2007): Semantic aspects of phrasemes. In Burger et al., *Phraseologie*. Berlin.
- Langlotz, A. (2006): *Idiomatic Creativity*. Amsterdam.
- Wegener, H. (1990): Der Dativ – ein struktureller Kasus? In Fanselow et al., *Strukturen und Merkmale syntaktischer Kategorien*, Tübingen, 70–103.

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The relation between iconic gestures and word finding difficulties

The procedure in this study consisted of in-depth studies of the features of word substitutions and of hand gestures used by children with different types of language disorders in naming tasks and in a conversational setting. The internal structure of iconic gestures—i.e. the preparation phase, prestroke hold, stroke, poststroke hold and recovery—is shown by means of examples produced by the three groups of children. One group has language comprehension problems; in their production, semantics and the lexicon are primarily affected (SEM/LEX group). Another group has no language comprehension problems and their main production problems affect phonology and grammar (PH/GR group). These two specific language impairment groups are compared to a matched control group (NSP). The examples are taken from situations when the children have word-finding problems and show how these problems are related to the internal structure of the gesture. A finding was that the SEM/LEX group was found to use iconic gestures lacking in semantic features. This was also the only group to express perceptual similarity without functional similarity in their iconic gestures and in their verbal responses. Other practices typical of this group were repetition of the same word and/or iconic gesture and showing the location on the body. The PH/GR group typically substituted iconic gestures for words when their utterances were not comprehensible; word substitutions tended to feature an entity becoming an action or a sound. Children in this group also elaborated on their words by providing additional information about function in their iconic gestures.

References

- Månsson, A.-C. (2003). *The relation between gestures and semantic processes: A study of normal language development and specific language impairment in children*. Gothenburg Monographs in Linguistics 23. Department of Linguistics, University of Göteborg, Sweden.

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Children's use of gesture: Label or performative?

This paper presents a study designed to test an assumption evident in the cognitive development literature (e.g., Goodwyn & Acredolo, 1993; Namy & Waxman, 1998; Striano et al., 2003, Tomasello et al., 1999) that hearing children with no sign language input treat gestures as labels for objects. Instead we will argue that children treat iconic gestures as performatives that reveal their understanding of the actions and other features associated with objects. In a previous study (Marentette & Nicoladis, 2009), children's use of iconic gestures improved significantly between ages 2 and 4 (cf., Namy et al., 2004). These results suggested that children were not treating gestures as labels, since iconicity is associated with children's very successful use of verbal labels.

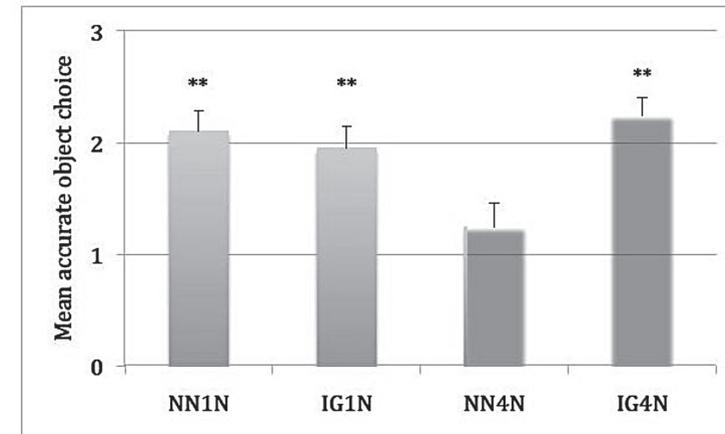
The present study directly compares children's ability to use novel nouns and iconic gestures in a fast-mapping task. Fast-mapping refers to children's on-line interpretation of a novel word. Previous studies (Markson & Bloom, 2007) of fast-mapping have shown that children tend to interpret novel words (e.g., a zilog) to refer to novel objects or objects for which they do not already have a label (e.g., a whisk). In our fast-mapping task, we taught 21 children aged 40–60 months 6 novel nouns (NN) and 6 iconic gestures (IG) and asked them to map them onto sets of 4 objects, varying in terms of number of familiar and novel objects. For all gesture requests, we included a single object that was an action-based match to the iconic gesture.

If gestures are treated as labels then children should respond similarly to novel nouns and iconic gestures. That is, they should use fast-mapping to identify the novel object when three familiar objects are presented (1N sets). Fast-mapping should fail as a method for choosing from four novel objects (4N sets): Since children can't proceed by exclusion, they should choose randomly or refuse to choose. By contrast, if gestures are treated as performatives, then children should show action-based motivated mapping to the target object given an iconic gesture request, regardless of number of novel distractors (1N or 4N sets).

Results support the hypothesis that children treat gestures as performatives. As can be seen in Figure 1, children successfully chose the target object using fast mapping with a novel noun request in the 1N set and using motivated mapping with a iconic gesture request regardless of set size (both 1N and 4N). Contrary to the gesture as label hypothesis, they did not treat all request conditions similarly with 1N sets and 4N sets. Planned pairwise comparisons support these distinctions.

These results lead us to conclude that, while experimenters may intend to use gestures as labels for objects, children do not interpret them that way. The multiple conditions used in our study demonstrate instead that children treat gestures as performatives, looking for motivated reasons to associate a gesture with a particular object.

Figure 1. Mean number of accurate object choices by condition



Asterisks indicate difference from chance responding ** $p < .001$. Error bars show standard error of the mean.

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Hand gesture eye-fixation and speaker evaluation of a persuasive video-message

Gestures of a speaker are differently perceived and processed by receivers according to their (in)congruence with the speech (Kelly et al., 2007). Hand movements, moreover, differently affect audience evaluation of the speaker, in particular for competence but not for warmth traits, and for speaker's and message's persuasiveness (Maricchiolo et al., 2009). More studies are now needed in order to understand the psychological processes accounting for these perceptual and evaluation effects. Among the possible processes, focal attention Yantis, S. (1998), as measured through eye-fixations (Levi, Klein, Aitsebaomo, 1985), could be a relevant one as a process which can be operationalized and measured in a relatively easy way (Duchowski, 2007). So far, very few studies have been conducted on the audience eye-fixation of a speaker's hand gesture: just qualitative evidence has been published (e.g., Gullberg & Holmqvist, 2006); while no studies have been carried out in order to record simultaneously eye-fixation and speaker and message evaluations. The hypotheses of the present study are: a) different kind of gestures/movements have different effects on competence and persuasiveness evaluations, according to the pattern known from the literature; b) different kind of gestures/movements are differently fixated, according to a pattern where most efficacious gestures/movements would receive less focal attention (e.g., they could be processed more automatically) than less efficacious gestures/hand movements. An experiment on 50 undergraduates was carried out to evaluate the effects of different hand gestures and movements on receivers' eye-fixations and evaluation of the speaker of a persuasive video-message. In the present study, data are collected while viewing four ad hoc video-messages. In each video the speaker performed only one kind of hand movements along four speech-congruence levels: only ideational gestures (most speech-congruent), only conversational gestures, only object-adaptors, only self-adaptors (least speech-congruent movements). The amount of receivers' eye-fixations during the vision and the receivers' evaluations at the end were measured. Statistical analyses confirm that speech-incongruent gestures were more fixated by the receiver (hypothesis b) and subsequently evaluated as less effective (in terms of speaker competence) and less persuasive than speech-congruent gestures (hypothesis a). Such results suggest that, although speech-congruent gestures are not focally fixated (probably because they are perceived as integrated with the speech), they are however processed by the receivers, because these gestures allow perceiving the speaker as more competent and persuasive. Adaptors, characterized by lack of congruence with either content or structure of the speech, are more fixated: therefore they receive more focal attention being therefore treated as information out of the context (Wright & Ward, 2008). Future experiments could try to manipulate eye fixation on a single kind of gesture/movement in order to assess causal role and mediation of gesture eye-fixation with respect to competence and persuasiveness audience evaluations.

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Embodied cognition and gesture studies

Hostetter & Alibali's (2008) gesture-as-simulated-action (GSA) framework seeks to combine gesture studies and embodied cognition. Gestures are seen as the result of the internal simulation of action in a coupled speech-gesture system. The neural activation of the simulation passes a certain threshold and is overtly expressed as gesture. This view is based on the assumption that thinking is simulated doing. Consequently, Hostetter & Alibali (2008: 502) describe gestures as a mere "by-product of our thoughts".

We share Hostetter & Alibali's basic approach to gestures. However, we disagree with their concept of embodiment. In the embodied cognition literature, it is a widely held view that cognition evolved to mediate bodily action and sensory input, i.e. the so-called sensorimotor loop. But there are two possible understandings of the sensorimotor loop and its role in cognitive processing. According to the first, it consists of the regular patterns of dependencies between sensory input and motor output. Such dependencies are subject to the idiosyncrasies of embodiment. However, they are arguably reducible to neural activity because the dependencies are mirrored in the brain. In philosophical terms, embodiment is only relevant on the level of the content of mental representations but not on the level of their vehicles. Research on embodied cognition can thus concentrate on neural processing alone since it mirrors all sensorimotor patterns (cf. e.g. Lakoff & Johnson 1999). This matches Hostetter & Alibali's (2008) view.

The second understanding of the sensorimotor loop depicts the body as providing new information processing opportunities outside the central nervous system (Clark 2008). Embodiment allows links between the motor and the sensory surfaces of the body that are functionally analogous to neural processing paths. In contrast to the first view, embodiment is relevant not only on the level of the content but also on the level of the vehicle, i.e. the physical structures that realize mental representations. It follows that embodiment cannot be reduced to neural processing. Rather, a theory of cognition has to look at the whole system, i.e. body and brain.

We present arguments for the latter view and show the consequences for an interpretation of gestures. Gestures are not "by-products" of thought, but causally relevant parts of the cognitive information processing system, on a par with neural activity. Based on Goldin-Meadow et al. (2001) we then discuss how such an interpretation of gestures relates to current debates in the philosophy of cognition on the extended mind thesis, the idea that the mind is not all in the head but is at times distributed across parts of the world (Clark 2008). As an alternative to the GSA model, we argue that gestures are actions that function by transforming the demands on and opportunities for cognitive processing. We show how this view equals the GSA framework in explanatory power and that it is compatible with other major theories of gesture (Kita 2000; McNeill 1992, 2005).

References

- Clark, A. (2008) *Supersizing the mind. Embodiment, action, and cognitive extension*. Oxford: Oxford University Press.
- Goldin-Meadow, S., Nusbaum, H., Kelly, S., & Wagner, S. (2001) Explaining math: Gesturing lightens the load. *Psychological Science* 12: 516–522.
- Hostetter, A. B. & Alibali, M. W. (2008) Visible embodiment: gestures as simulated action. *Psychonomic Bulletin & Review* 15(3): 495–514.
- Kita, S. (2000) How representational gestures help speaking. In: McNeill, D. (Ed.) *Language and gesture*. Cambridge: Cambridge University Press. 162–185.
- Lakoff, G. & Johnson, M. (1999) *Philosophy in the flesh. The embodied mind and its challenge to western thought*. New York: Basic Books.
- McNeill, D. (1992) *Hand and mind*. Chicago: Chicago University Press.
- McNeill, D. (2005) *Gesture and thought*. Chicago: Chicago University Press.

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Gestural holds, superimposed beats, and the issue of cross-modal alignment

Gesture researchers often note the existence of superimposed beats on gestural productions while coding gesture during discourse. These superimposed beats are typically attributed to the rhythmic structure of conversation, as they seem to factor into a sort of gestural prosody coordinated with the prosodic structure of cooccurring speech. This is particularly apparent when they co-occur with speech stress marking during held gesture positions. This is undoubtedly because the held position places the beat movement into salience, however, it is not unreasonable to think of these beats and holds as devices serving both the maintenance and transformation of the relationship between the represented elements within the two modalities of speech and gesture. Kita has suggested that prestroke holds occur as a coordinating device to allow speech to catch up to gesture, but as of yet, little has been said about the range of discursive functions for held gesture positions in general. As for superimposed beats, little has been made of what their various discursive functions might be as well. In this study, I attempt to unravel at least some of these knotty issues by showing how the superimposed beat serves to realign the relationship between the representations in the visual and oral modalities, with examples drawn from a set of video recorded English language conversations. The gestural hold often serves to contextualize new elements introduced in speech; by coordinating superimposed beats with these new elements as they are introduced, speakers in effect reset the relation between the held gesture and the new information in the discourse, in a way that parallels the prosodic function in the speech channel.

By marking both the salience of the held representation to coordinated speech elements, and vice versa, superimposed beats significantly contribute to discourse cohesion and coherence in the multimodal universe of face-to-face conversation. Far from being simple markers of rhythmic structure, these data show how even lowly beats are wrapped with intention. I will conclude by discussing how these data relate to the notion of the indexical field in gesture, extrapolating from Bühler (1983) [1934].

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Laterality and gestural communication in captive baboons and chimpanzees: Searching for the precursors of language

A recent theory claims that language may have its first phylogenetic roots in gestural communication rather than in vocal behaviours (Corballis, 2002). This theory finds supports notably in the evidence of continuities between the communicative gestural system in nonhuman primates and some features of human language such as intentionality, flexibility of learning and of use, and some referential properties (Meguerditchian & Vauclair, 2008; Pika, 2008).

Since most of the linguistics functions are controlled by the left cerebral hemisphere in humans, the question of a continuity with the lateralization of the cerebral substrate involved in the control of this gestural communication remains unclear in nonhuman primates. Thus, in order to investigate this question, the study of manual asymmetries for communicative gestures might constitute an indirect approach for inferring their hemispheric lateralization (Hopkins, 2007).

In our studies, using an observational method, manual preferences have been assessed for different categories of intraspecific communicative gestures (hand slap, extended arm, etc.) and of gestures directed to humans (pointing) in captive groups of baboons (n=60) and chimpanzees (n=74). Regardless of the categories of gestures, manual preferences for gestural communication showed a predominance of right handedness that is more pronounced than the one related to manipulative motor actions (unimanual reaching, bimanual coordinated task, nose wipe) as well as an absence of correlation of individual manual biases with these non communicative motor actions.

These results suggest the hypothesized existence of a specific gestural communicative system lateralized in the left hemisphere, in both species (Meguerditchian & Vauclair, 2006, 2009; Meguerditchian et al., in press). This system might thus constitute a phylogenetic prerequisite of the left-lateralized cerebral substrate for language in the common ancestor of baboons, chimpanzees and humans. Such a hypothesis will be discussed in the light of recent neuroanatomical and functional brain imaging studies concerning communicative behaviours in nonhuman primates, notably chimpanzees (Tagliatela et al., 2006, 2008). Finally, these collective findings will be confronted to the theories about the gestural origin versus vocal origin of human language.

References

- Corballis, M. C. (2002). *From hand to mouth. The origins of language*. Princeton, NJ: Princeton University Press.
- Hopkins, W. D. (Ed.). (2007). *Evolution of hemispheric specialization in primates*. London: Elsevier/Academic Press.
- Meguerditchian, A., & Vauclair, J. (2006). Baboons communicate with their right hand. *Behavioral Brain Research*, 171, 170–174.
- Meguerditchian, A., & Vauclair, J. (2008). Vocal and gestural communication in nonhuman primates and the question of the origin of language. In L. S. Roska-Hardy & E. M. Neumann-Held (Eds.), *Learning from animals? Examining the nature of human uniqueness* (pp. 61–85). London: Psychology Press.
- Meguerditchian, A., & Vauclair, J. (2009). Contrast of hand preferences between communicative gestures and non communicative actions in baboons: implications for the origins of hemispheric specialization for language. *Brain and Language*, 108, 167–174.
- Meguerditchian, A., Vauclair, J., & Hopkins, W. D. (in press). Captive chimpanzees use their right hand to communicate with each other: Implications for the origins of the cerebral substrate for language. *Cortex*.
- Pika, S. (2008). Gestures of apes and pre-linguistic human children: Similar or different? *First Language*, 28, 116–140.
- Tagliatela, J. P., Cantalupo, C., & Hopkins, W. D. (2006). Gesture handedness predicts asymmetry in the chimpanzee inferior frontal gyrus. *NeuroReport*, 17, 923–927.
- Tagliatela, J. P., Russell, J. L., Schaeffer, J. A., & Hopkins, W. D. (2008). Communicative signaling activates “Broca’s” homologue in chimpanzees. *Current Biology*, 18, 343–348.

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Semiotic forms and functions of gestures used in dialogues by aphasic and non-aphasic speakers

In aphasiology it has been recognized for some time now that an account of both successful and problematic communicative strategies of aphasic speakers remains incomplete unless the multimodal and interactive nature of conversational exchanges is an integral part of analytic procedures (Springer et al 1998). It has been suggested that “gestural and verbal communication patterns change in parallel fashion in aphasia” (Glosser et al. 1986: 355) and that overall aphasics communicate better than their linguistic performance may suggest (cf. de Ruiter 2006; Feyereisen 1993).

This study investigates the multimodal communicative behavior of eight German-speaking chronic aphasic persons during face-to-face conversations about four different “Mr. Bean” movies (keeping the setting and dialogue partner constant during all audio/video recordings). In addition, eight controls matched in terms of age, gender and education participated in the study. According to the Aachen Aphasia Test, the aphasic subjects show various symptoms of moderate agrammatism in spontaneous speech, lexical access problems, and five of them also exhibit speech apraxia. Results of a previous study using the same data, but focusing on the verbal exchanges (Springer 2006) suggested that interactivity with the interlocutor crucially impacts not only lexical and syntactic parameters but also repair strategies employed by both aphasic and non-aphasic speakers.

Building on these insights, this paper compares the semiotic forms and functions of gestures produced by aphasic and non-aphasic speakers (McNeill 2005). Of central interest is the use of both iconic and indexical gestures and how it correlates with the concurrent speech, regarding syntactic structures, semantic selection and lexical access. In light of the range of all subjects’ expressive possibilities and tendencies, each speaker’s use of indexical and iconic gestures is analyzed. For each aphasic speaker, the production of each of the two gesture types is correlated with the respective linguistic impairments, especially regarding the ability to form grammatically correct phrases and sentences and/or to select correct content words (Jakobson 1956). While these aspects are teased apart for analytic purposes, they do interact to various degrees in the multimodal dialogues under investigation.

This work is in line with the observation that the use of gestures in aphasic discourse does not simply facilitate lexical access, but reflects complex communicative strategies (Duncan & Pedelty 2007). The results of the present study will form the basis for subsequent contrastive investigations of both dialogic and monologic discourse to further examine possible genre-based interactivity effects that may motivate different patterns of gesture-speech correlation.

References

- de Ruiter, J.P. (2006). Can gesticulation help aphasic people speak, or rather, communicate? *Advances in Speech-Language Pathology*, 8(2): 124–127.
- Duncan, S. & Pedelty, L. (2007). Discourse focus, gesture, and disfluent aphasia. In S. Duncan et al. (Eds.), *Gesture and the Dynamic Dimension of Language*. Amsterdam, Philadelphia: John Benjamins.
- Feyereisen, P. (2006). How could gesture facilitate lexical access? *Advances in Speech-Language Pathology*, 8(2): 128–133.
- Glosser, G., Wiener, M. & Kaplan, E. (1986). Communicative gestures in aphasia. *Brain and Language*, 27: 345–359.
- Jakobson, R. (1956/1990). Two aspects of language and two types of aphasic disturbances. In L.R. Waugh & M. Monville-Burston (Eds.), *Roman Jakobson: On Language*. Harvard University Press.
- McNeill, D. (2005). *Gesture and Thought*. Chicago University Press.
- Springer, L., Miller, N., & Bürk, F. (1998). A cross-language analysis of conversation in a trilingual speaker with

aphasia. *Journal of Neurolinguistics*, 11: 223–241.

Springer, L. (2006). *Medienspezifische Performanz: Eine empirische Studie mit Agrammatikern und Sprachgesunden*. Idstein: Schulz-Kirchner.

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Converging hands or converging minds?

For certain co-speech hand gestures, interlocutors repeat each others' gesture forms (i.e. de Fernel, 1992). This mimicry of gesture forms may be thought of as either automated behavioral mimicry (Chartrand & Bargh, 2003), such as yawning when someone else yawns, or linguistic alignment (Pickering & Garrod, 2004), such as lexical entrainment (i.e. both using 'sofa' rather than 'couch'). In lexical entrainment, similarity is not limited to displayed behavior, but there is similarity in the pairing of form and meaning. If gesturing is part of communication (i.e. Kendon, 2004), then are similarities in interlocutors' gestures tied to similarities in the meanings they are paired with as well?

To answer this question we let a confederate and a participant take turns giving each other route descriptions. Stimuli were bird's view drawings of a city scene, depicting a simple route that had to be remembered. The confederate varied the handshape of her gestures: either one or four fingers were extended as an index. She also varied her gestures' perspective. Directions were depicted either with hand movement in the horizontal plane and fingers pointing in the direction of the movement, as though following a route, or with movement in the vertical plane, with the fingers pointing forward, as though pointing on a map. This rendered a 2 (handshape) x 2 (perspective) between subjects design, N=40. Verbal descriptions were not varied.

If mimicry in gesture is simply mimicry of form, each of the confederate's articulators could be aligned with, but we cannot make predictions about interactions between handshape and perspective. However, if meanings are aligned, we do expect a relation between the different articulators. For example, if participants think of the route as on a map, because of the confederate's vertical gestures, they should be more likely to point with their finger, since one usually does not point at a map with all fingers extended.

We coded handshape and perspective for each path gesture produced. A decision about the gesture's perspective was based on three articulators: hand orientation, movement, and location in the gesture space. The confederate's perspective had a significant effect on participants' perspective, $\chi^2(2)=31.98$, $p < .001$, as well as on their handshape, $\chi^2(1)=10.94$, $p < .01$. If the confederate gestured in the vertical plane, participants were more likely to do so as well, and also more likely to use one finger as an index, see Figure 1 and 2. Yet we did not find an effect of the confederate's handshape. This suggests that not the forms of the gestures are converging, but the associated meanings.

Figure 1: Effect of the Confederate's Perspective on Participants' Perspective

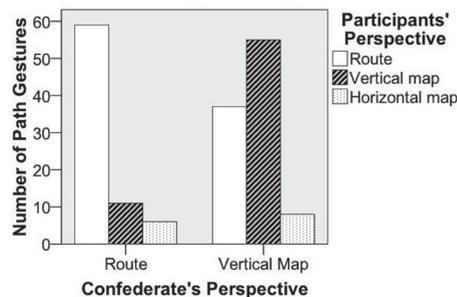
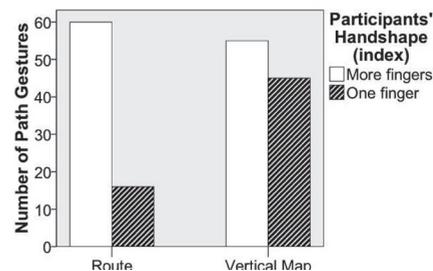


Figure 2: Effect of the Confederate's Perspective on Participants' Handshape



References

Chartrand, T. & Bargh, J. (2003). The chameleon effect: The perception-behavior link and social interaction, *Journal of Personality and Social Psychology*, 39(4), 393–398.

De Fernel, M. (1992). The return gesture, In: *The contextualization of language*, P. Auer & A. di Luzio, Eds. Amsterdam: John Benjamins, 159–193.

Kendon, A. (2004). *Gesture: visible action as utterance*. Cambridge: Cambridge University Press.

Pickering, M. & Garrod, S. (2004). Toward a mechanistic psychology of dialogue, *Behavioral and Brain Sciences*, 27, 169–226.

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Affective priming for familiar and unfamiliar emotional faces in persons with Down Syndrome

Persons with Down syndrome (DS) seem to have a deficit to recognize negative emotional faces (Wishart, Cebula, Willis & Pitcairn, 2007; Wishart & Pitcairn, 2000; Pitcairn & Wishart, 2000; Turk & Cornish, 1998). Some research on cognitive psychology shows that this deficit is present even in the automatic facial processing (Morales, Lopez & Hedlefs, in press). However, variables like facial familiarity stay unexplored in this kind of studies. The goal in this research was to test the hypothesis that recognition deficits on negative information reported by academic literature on this population does not apply to automatic emotional processing of meaningful negative information (familiar faces). To test this, persons with Down syndrome (DS) were required to participate in a face recognition experiment to recognize familiar (DS faces) and unfamiliar emotional faces (non DS faces), by using an affective priming paradigm. Pairs of emotional facial stimuli were presented (one face after another) with an SOA of 300 ms and the ISI set up to 50 ms. The goal was to test the hypothesis that recognition deficits on negative information reported by academic literature on this population does not apply to automatic emotional processing of meaningful negative information (familiar faces). Results showed that not all of the participants have a recognition deficit on negative stimuli and interestingly, positive familiar faces could not be primed by other valenced facial stimuli. However, positive familiar faces were recognized faster than neutral faces. Implications are discussed at the end of the paper.

References

- Morales, M. G. E., López, R. E. O. & Hedlefs, A. M. I. (in press). La psicología de las emociones: expresión facial, emoción y pensamiento [Psychology of emotions: facial expression, emotion, and thought]. Mexico: Trillas
- Pitcairn, T. K., & Wishart, J. G. (2000). Face processing in children with Down syndrome. In D., Weeks, R. Chua, & D. Elliot (Eds.), *Perceptual-Motor behavior in Down syndrome*. Edinburgh (pp. pp. 123–147). Champaign, Ill: Human Kinetics.
- Turk, J., & Cornish, K. (1998). Face recognition and emotion perception in boys with fragile X syndrome. *Journal of Intellectual Disability Research*, 42, 490–499.
- Wishart, J. G., & Pitcairn, T. K. (2000). Recognition of identity and expression in faces by children with Down syndrome. *American Journal on Mental Retardation*, 105(6), 466–479.
- Wishart, J. G., Cebula, K. R., Willis, D. S., & Pitcairn, T. K. (2007). Understanding of facial expressions of emotion by children with intellectual disabilities of differing aetiology. *Journal of Intellectual Disability Research*, 51(7), 551–563.

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Helping hands – The role of iconic gesture in verb learning in children

Although the role of pointing gestures in noun acquisition has been widely reported, the relationship between iconic gestures and verb acquisition is far less understood. Kelly and colleagues (2009) found that adults learned verbs more effectively if they received appropriate iconic gestures. Goodrich and Hudson-Kam (2009) found that children were able to link a novel verb to a scene in which somebody acted on an object, when iconic gestures depicted the action. It is not clear, however, whether iconic gestures helped children link the verb to the action or something else such as the object. This is because children have a tendency to believe the verb represents the actor/object as well as the action (e.g. Imai, Haryu & Okada, 2005; Kersten & Smith, 2002). The present study investigates whether children identify only an action as the referent of a novel verb more often when the verb is introduced with an iconic gesture congruent with the referent action.

Forty-five children, aged between 35 and 48 months ($M = 42.2$, $SD = 4.0$) participated in the study. Participants were randomly assigned to three groups, which differed in terms of gestures they received during the training phase. Children in the congruent iconic gesture condition received gestures that matched the referent action. Children in the incongruent iconic gesture condition received gestures that matched a different action. Children in the no gesture condition received no iconic gestures. All participants were taught six novel verbs in three pairs. Each verb was taught in the following format: 'He's going to dax! Wow, he's daxing!' In the testing phase children were tested on only one of the two novel verbs introduced in the training phase. They were asked whether the novel verb referred to the event in two test videos. Over the three pairs, each child was shown four types of test videos: the same person-same-action (SPSA), different-person-same-action (DPSA), same-person-different-action (SPDA) and different-person-different-action (DPDA).

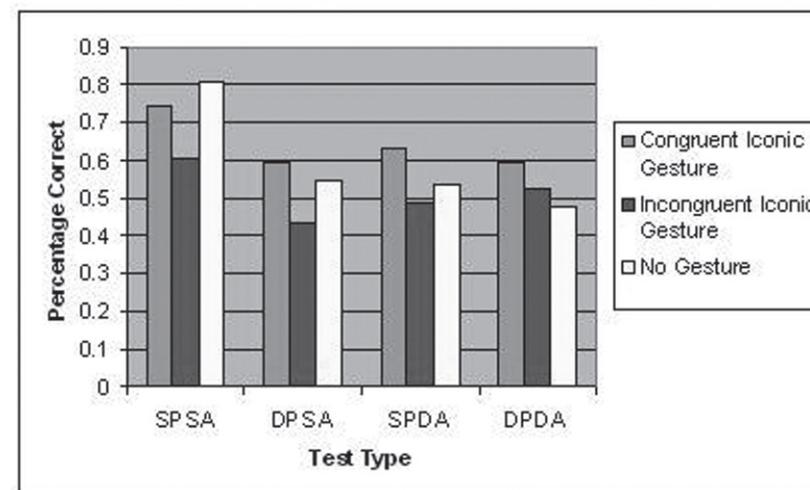


Figure 1. The percentage of correct responses in the four test types and the three gesture types.

Correct responses were those when children either said 'yes' to a test video showing the same action, or 'no' to a test video showing a different action. The percentage of correct responses was entered into a mixed factor ANOVA with test type as a within-participant independent variable and gesture type as a between-participant variable (Figure 1). The results showed a marginally significant effect of gesture condition ($p=.072$), such that children were more likely to be correct in the congruent iconic condition than in the incongruent gesture condition. There was no interaction between test type and gesture type. That is, congruent iconic gestures may be equally helpful in facilitating children to accept the same action (regardless of actor) and reject different actions (regardless of actor) as a referent of a novel verb.

The preliminary results suggest that children can use information in iconic gestures during verb acquisition. We suggest that gestures may help children to focus on actions and ignore actors as the referent of a novel verb.

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“Ich sehe two fingers”: Bilingual children understand the one-to-one correspondence in number gestures earlier than monolingual children

In many cultures, there is a one-to-one correspondence between the number of fingers held up and the quantity being mentioned. Children between the ages of two and five years do not necessarily take advantage of this one-to-one correspondence (Nicoladis, Pika, & Marentette, accepted; cf. Weise, 2005). Young children learn number gestures as conventional forms and may be sensitive to the function of number gestures rather than the potential transparency in symbolic form.

The purpose of the present study was to test the hypothesis that bilingual children (with exposure to two different number gesture systems) would demonstrate earlier sensitivity to the one-to-one correspondence available in number gestures relative to monolingual children. Previous studies have shown that bilingual children show advantages over same-age monolingual children in tasks involving selectively attending to the relevant variables of a problem and ignoring the irrelevant variables (see review in Bialystok, 2001). The bilingual advantage in selective attention could come from experience with choosing the appropriate language for the context, thereby deactivating the inappropriate language.

For this study, we compared the gestural performance of 30 German-English bilinguals and 30 English monolinguals, aged three- to five years. Germans generally gesture 'two' by holding up their thumb and index finger while English-speaking Canadians gesture 'two' by holding up their index and middle fingers (Pika, Nicoladis, & Marentette, 2009).

The children were asked to give a number of objects corresponding with three categories of gestures: 1) conventional gestures used by English-speaking Canadians (e.g., index and middle finger for 'two'), 2) conventional gestures used by German speakers (e.g., thumb and index for 'two'), and 3) gestures that are unconventional in both cultures (e.g., two index fingers held up).

We had three predictions: Firstly, there would be no differences between the bilingual and monolingual children in their correct interpretation of Canadian conventional gestures. Secondly, the bilingual children would outperform the monolinguals in interpreting German conventional gestures, because the monolinguals had no exposure to them and would not simply use the one-to-one correspondence available in the German conventional gestures. Most importantly, thirdly, we predicted that the bilingual children would outperform the monolinguals in interpreting unconventional gestures. That is, they would demonstrate that they understood the principle of one-to-one correspondence.

The results bore out these predictions, with one limitation. The bilinguals outperformed the monolinguals on unconventional gestures, but only for quantities of one through three.

These results confirm the previous findings that monolingual children are not sensitive to the one-to-one correspondence in gestures: if they had been, they would have been on par with the bilingual children in interpreting conventional German gestures. We argue that these results suggest that bilingual exposure to two different number systems leads to the development of earlier sensitivity to the one-to-one correspondence available in number gestures. This development is limited to small quantities for children in this age range, perhaps due to processing limitations.

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Deaf culture in Poland in the light of the American paradigm of Deaf culture: Cultural identity of Polish Deaf people and their self-awareness of language and cultural diversity

In the second part of 20th century some fundamental changes in the recognition of American Sign Language (ASL) as a language have occurred in the US. It was a base to initiate different actions focused on braking the monopoly of hearing people to use oral methods in the education of Deaf people. In the 1970 the term Deaf culture was developed as a reflection of beliefs that Deaf communities have their own visual ways of life connected with sign language. In terms of language diversity of Deaf people they have a tendency to perceive themselves as a language minority group rather than a group of people with disability. A perspective of being culturally Deaf allows to distinct the two cultural groups: Hearing culture and Deaf culture both of which determine a development of a different cultural identities. Because of the internal diversity within a group of deaf people, this dimension may include multiple identity labels such as: hearing – impaired, hard of hearing, oral deaf, late deafened, Deaf. Each of them is conditioned by varied choices of: self – representations, communication, language, individual functioning, socialization with hearing/deaf persons (I.W. Leigh, 2009, p.9).

Deaf culture issues in Poland and Deaf identity have just begun to be visible in a social discourse, but there are not any scientific research in that field. Educational experiences show the domination of the politics of oralism. Therefore, those issues remain open and encouraging to empirical research.

This study explores an issue of cultural identity among deaf/Deaf and hard of hearing people by making attempts to answer a research question: What is a cultural identity of Polish deaf and hard of hearing people? It's aim is to examine a process of acculturation into Deaf culture in Poland as well. The article presents the results of a research conducted among fifty deaf and hard of hearing people in Poland of different age groups. The method of the research was individuals being interviewed using Polish adaptations of The Deaf Identity Development Scale of N. S. Glickman and The Deaf Acculturation Scale (DAS-sf) of Deborah Maxwell – McCaw. The research analysis will measure four identity variables of Polish deaf and hard of hearing people: hearing, marginal, immersion, and bicultural as well as will allow to examine a level of Deaf acculturation with reference to five components: identification, cultural involvement, cultural preferences, cultural knowledge, language preferences. Practical and short – term results of research will be: establishing of current knowledge of Deaf people in Poland about their culture, determining factors that impact on development of cultural identity of Deaf people in Poland. The main long – term impact will be introducing a bicultural – bilingual education in Poland.

References

- Kannapell B., *Language Choice – identity choice*, Linstok Press, Burtonsville 1993.
 Ladd P., *Understanding Deaf culture. In Search of Deafhood*, Multilingual Matters LTD, USA 1997.
 Lane H., Hoffmeister R., Bahan B., *A journey into the Deaf World*, DownSignPress, California 1996.
 Lane H., *When the mind hears: A history of the Deaf*, Random House, New York 1984.
 Leigh I. W., *A lens on Deaf Identities*, Oxford University Press, New York 2009.
 Marschark M., Spencer P. E., *Oxford Handbook of Deaf Studies, Language and Education*, Oxford University Press, Oxford 2005.
 Padden C., Humphries T., *Deaf in America – Voices from a Culture*, Harvard University Press, Cambridge 1988.
 Padden C., Humphries T., *Inside Deaf culture*, Harvard University Press, Cambridge 2006.
 Stokoe W., *Sign and culture*, Linstok Press, Maryland 1980.

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Tomorrow, uphill: Geocentric temporal gestures in the remote mountains of Papua New Guinea

Abundant research in the study of human cognition has shown that time is primarily construed in terms of uni-dimensional space (see Núñez & Sweetser, 2006 for a review). However, relatively little work has been done in the domain of temporal gestures. Aside from the Núñez & Sweetser (2006) study on Aymara construals of time, not much is known about how non-Western, oral-tradition cultures construe time spatially and how such construals manifest in gesture. Moreover, the limited existing literature has only covered cases in which time is construed either in terms of intrinsic or egocentric spatial frames of reference. It is well-known that some cultures favor “absolute” terms for spatial reference, such as Guugu Yimithir in Australia (Levinson, 2003), or the Balinese who, beyond general cardinal directions, recruit specific geocentric spatial references (Wassmann & Dasen, 1998). Are there human groups that construe past and future times via geocentric spatial frames of reference? In this study we address this question by investigating spatial construals of time among the Yupno people from the remote mountains of Papua New Guinea. The Yupno have previously been reported to use geocentric spatial frames of reference, a fact probably related to the rugged topography of the Yupno valley (Wassmann, 1994). In Yupno language there are some lexical items that point to the fact that its speakers might use geocentric frames of reference to construe temporal relations. The word for “uphill”, for instance, also means “tomorrow”. Here, we investigate the spontaneous gesture production of Yupno speakers while talking about time, and provide what is, to our knowledge, the first documented case of geocentric construals of time on large scales.

We conducted a series of semi-structured, naturalistic interviews, in which 36 participants explained the meaning of 15 pre-recorded Yupno temporal expressions. Interviews, which were recorded with a HD-camera, took place both inside and outside of traditional Yupno homes, and the participants' facing direction was systematically varied. Results indicate that overall Yupno people construe past times as downhill and future times as uphill. But, unlike all reported cases of spatial construals of time, which describe the temporal axis as being based on a single line or vector, Yupno construals have two different vectors: one downhill vector with a slight slope denoting past, and another uphill vector roughly in the opposite direction with a much higher slope denoting future. Further, Yupno temporal gestures are produced, not only with the hands, but also with the head and eyes. We also discuss fine-grained details of certain gesture morphologies—e.g. gestures co-produced with the Yupno word for now— as they suggest other ways in which Yupno temporal construals differ from Western construals.

References

- Levinson, S. C. (2003). *Space in language and cognition*. Cambridge: Cambridge University Press.
 Núñez, R. & Sweetser, E. (2006). With the future behind them: Convergent evidence from Aymara language and gesture in the crosslinguistic comparison of spatial construals of time. *Cognitive Science*, 30(3), 401–450.
 Wassmann, J. (1994). The Yupno as post-Newtonian scientists: The question of what is “natural” in spatial description. *Man*, 29, 645–666.
 Wassmann, J., & Dasen, P. (1998). Balinese spatial orientation: Some empirical evidence of moderate linguistic relativity. *The Journal of the Royal Anthropological Institute*, 4(4), 689–711.

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Displaying perturbations during simultaneous talk

This paper aims at studying gesture and other types of bodily conduct during instances of competitive simultaneous talk. Within the framework of Conversation Analysis, it has already been shown how perturbations due to overlapping talk are linked to the suspension or the withdrawal of a gesture, indicating the speaker's interruption (Schegloff 1984). It has also been shown how speakers can anticipate their self-selection in competitive environments by using a pointing gesture (Mondada 2004, 2007) or by making use of a visible theatrical performance (Schmitt 2005). Nevertheless, no research has been done on speakers' bodily conduct during overlap that explicitly addresses the competing co-participant and the problematic character of his concurrent talk. Using data from videotaped ordinary conversations in French and German, I therefore wish to focus on the use of bodily resources for visibly defending one's speaking turn against a competitive line of talk. How do speakers gesture and move during competitive overlaps, and what can be said about the embodied character of the fight for the floor (Schegloff 2000)? A fine-grained multimodal transcription helps to align visible actions with the speakers' turns, showing that speakers do not simply either continue or suspend the gesture they carried out before the overlapping talk, but that certain bodily conducts are indeed shaped for visible competition. While it is true that pointing gestures can be used not only as a turn-entry device, but also as a turn defending device, my data show that participants do not confine themselves to conspicuous pointing gestures, but that they use a whole range of visible resources during simultaneous competitive speech. Rhythmic head movements, modifications of gaze direction, the manipulation of objects in a visible and/or audible and rhythmic way, gestures of the open palm or changes of the body position are carried out during overlapping talk in order to display the problematic character of the simultaneous talk to the concurrent speaker. Those visible interventions within the participants' shared interactional space are often followed by one speaker's withdrawal from the turn, thus resolving the overlap. This shows that simultaneous talk, despite its qualities as an audible phenomenon, is managed and resolved by speakers in an embodied way.

References

- Mondada, Lorenza (2004). Temporalité, séquentialité et multimodalité au fondement de l'organisation de l'interaction: Le pointage comme pratique de prise de tour. *Cahiers de Linguistique française* 26, 269–292.
- Mondada, Lorenza (2007). Multimodal resources for turn-taking: pointing and the emergence of possible next speakers. *Discourse Studies* 9, 194–225.
- Schegloff, Emanuel A. (1984). On some gestures' relation to talk. In: Atkinson, J. M.; Heritage, J. (Eds.), *Structures of Social Action. Studies in Conversational Analysis*. Cambridge: Cambridge University Press, 266–296.
- Schegloff, Emanuel A. (2000). Overlapping talk and the organization of turn-taking for conversation. In: *Language in Society* 29 (1), 1–63.
- Schmitt, Reinhold (2005). Zur multimodalen Struktur von turn-taking. *Gesprächsforschung—Online—Zeitschrift zur verbalen Interaktion* 6, 17–61.

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Do iconic gestures pave the way for children's early verbs?

Young children use gesture to communicate before they produce their first words (Bates, 1976). The earliest gestures children use, typically beginning around 10 months, are deictics—gestures whose referential meaning is given entirely by the context and not by the form of the gesture (e.g., point at bottle). At this early stage, deictic gestures offer children a tool to refer to objects before they have words for those objects, and children take advantage of this offer—they produce a deictic gesture for a particular object (point at dog) approximately three months before they produce the verbal label for that object (dog) (Iverson & Goldin-Meadow, 2005). Gesture thus paves the way for children's early nouns. But children also use a second type of gesture at this early stage—iconic gestures—gestures that convey actions associated with objects (e.g., flapping arms to represent a bird flying; Acredolo & Goodwyn, 1985). The question we ask here is whether iconic gestures pave the way for children's early verbs in the same way that deictic gestures pave the way for children's early nouns.

The existing evidence suggests two equally plausible, but contradictory possibilities: (1) If gesture is an instrument, or even just a harbinger, of new verb meanings, then we would expect children's first iconic gestures that convey actions to precede the first verbs they produce conveying similar meanings. (2) If, on the other hand, verb semantics are such that simple iconic gestures conveying actions are not likely to be helpful in bootstrapping verb meanings, then we would expect children's first verbs to precede, or to co-occur with, the first iconic gestures they produce conveying similar meanings.

To explore the role that iconic gestures play in the emergence of early verbs, we followed 40 children longitudinally and examined their spontaneous speech and gestures. Each child was videotaped for 90 minutes at 14, 18, 22, 26, 30, and 34 months of age, interacting with their caregivers. All gestures and speech were transcribed, and all iconic gestures depicting action (e.g., flapping arms to represent BIRD-FLYING) and all verbs conveying action (e.g., eat, fly, throw) were extracted from the transcripts. We asked whether the children used iconic gestures to convey action meanings and, if so, whether those gestures were used prior to the onset of verbal labels for the same kinds of action meanings.

We found that children produced their first iconic gestures 7 months later than they produced their first verbs. Thus, unlike the onset of deictic gestures, which precede and predict children's first nouns, the onset of iconic gestures conveying action meanings did not precede children's first verbs. Nonetheless, children routinely used iconic gestures to convey a different set of action meanings than they conveyed in their early verbs, suggesting that the children used gesture to expand their repertoire of action meanings. As such, iconic gestures may offer young children a technique for filling in lexical gaps in their action vocabularies. Children take advantage of this technique, but only after they have begun to acquire the verb system underlying their language.

References

- Acredolo, L. P. & Goodwyn, S. W. (1985). Symbolic gesturing in language development. *Human Development*, 28, 40–49.
- Bates, E. (1976). *Language and context*. New York: Academic Press.
- Iverson, J. M. & Goldin-Meadow, S. (2005). Gesture paves the way for language development. *Psychological Science*, 16, 368–371.

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Does language about similarity play a role in fostering similarity comparison in children?

The expression of relations between objects based on perceptual commonalities (but-terfly is like rainbow) constitutes an important linguistic achievement—one that is likely to serve as the stepping-stone for the development of categorization (Landau, et al., 1988) and metaphorical abilities (Gentner, 1988). Prior work suggested a facilitating effect for language in learning relational commonalities between objects. In this study, we investigate whether language has such an effect on learning perceptual commonalities between objects. On the one hand, conveying perceptual similarities between objects may be so basic that children ought to express similarity comparisons regardless of whether they have explicit terms for comparison in their language. On the other hand, although the simple, global similarity that often holds between objects from the same category (e.g., similarity between cat and tiger) may be salient even to very young children, there is considerable evidence that more focused partial similarities (e.g., similarity between red apple and red book, objects from different categories) is not as obvious (Smith, 1983). Thus, their emergence in speech might be more closely tied to the emergence of explicit terms for comparison.

To explore whether having a conventional linguistic system is necessary for children to comment on different types of similarity comparisons, we observed longitudinally (27-54 months) four homesigners who had not been exposed to usable linguistic input—deaf children whose hearing losses prevented them from learning spoken language and whose hearing parents had not exposed them to sign language, and compared their performance to 40 hearing children, observed longitudinally for two years, from 14 to 34 months. We asked whether deaf children used their gestures to comment on similarity comparisons and, if so, which types of comparisons they expressed. We extracted all communicative acts conveying similarity comparisons and classified them into three: (1) similarity comparison in gesture-only (POINT TO LOLLIPOP+POINT TO BALLOON), (2) similarity comparison in gesture+speech combinations without the word like (lollipop+POINT TO BALLOON), and (3) similarity comparison in speech, with the word like (balloon is like lollipop). We further coded all similarity comparisons in terms of the category membership of the objects compared, as either belonging to the same superordinate category or to different superordinate categories. In addition, we coded all similarity comparisons in terms of the degree of feature overlap, as based on either a single feature (e.g., color) or on multiple features (e.g., shape and color).

We found that all deaf children expressed similarity comparisons in gesture-only, resembling those conveyed by hearing children in early gesture+speech combinations. However, the two groups diverged at later ages. Hearing children, after acquiring the word like, shifted from primarily expressing global similarity (cat+POINT TO TIGER) to primarily expressing single-feature similarity comparing objects from different categories (crayon is brown like my hair). In contrast, the deaf children, lacking an explicit term for similarity, continued to primarily express global similarity (Figures 1-2). The findings underscore the robustness of similarity comparisons in human communication, but also highlight the importance of conventional terms for comparison as likely contributors to expressing more focused similarity relations.

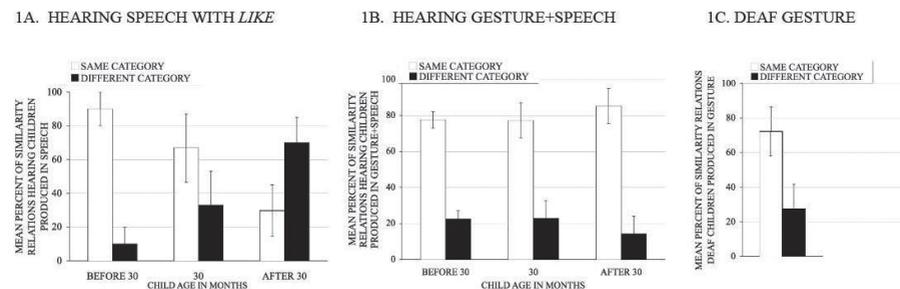


Figure 1. Similarity relations produced by hearing children in speech with the word “like” (Panel A) or in gesture+speech without the word “like” (Panel B) and by deaf children in gesture (Panel C), grouped according to whether the comparison involved objects from different superordinate categories (black bars) or objects from the same superordinate category (white bars). The data are divided into three time points: before, at, after the 30-month observation session, the moment when like became frequent in the hearing children’s similarity comparisons.

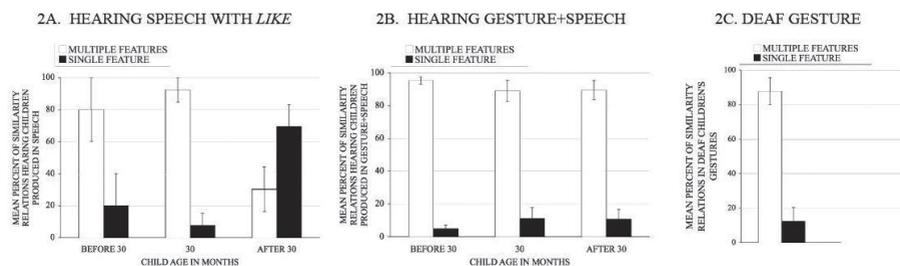


Figure 2. Similarity relations produced by hearing children in speech with the word “like” (Panel A) or in gesture+speech without the word “like” (Panel B) and by deaf children in gesture (Panel C), grouped according to whether the comparison involved a single dimension (black bars) or multiple dimensions (white bars). The data are divided into three time points: before, at, after the 30-month observation session, the moment when like became frequent in the hearing children’s similarity comparisons.

References

- Gentner, D. (1988). Metaphor as structure mapping: the relational shift. *Child Development*, 59, 47-59.
 Landau, B., Smith, L. B., & Jones, S. S. (1988). The importance of shape in early lexical learning. *Cognitive Development*, 3, 299-321.
 Smith, L. B. (1983). Development of classification: The use of similarity and dimensional relations. *Journal of Experimental Child Psychology*, 36, 150-178.

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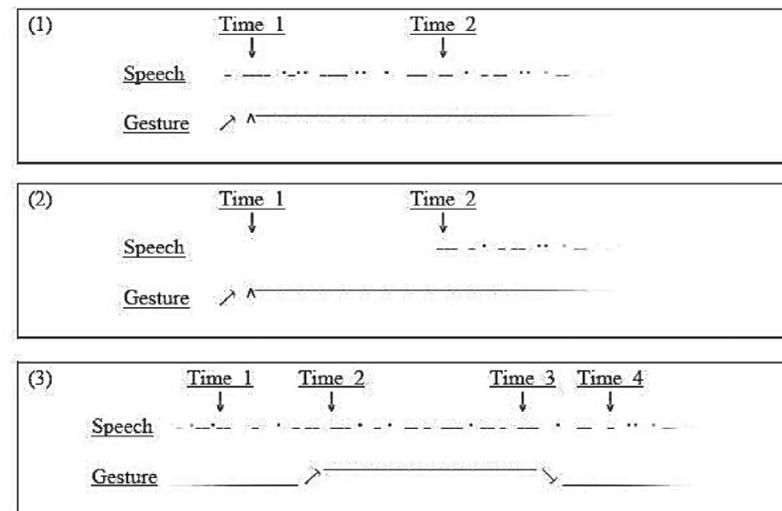
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Retrospective, prospective, and bracketing functions of gesture holds

The work presented here explores the ability of gesture *holds* to remain available to perception across much longer time intervals than the spans associated with typical gesture strokes or spoken words or phrases. Prior statements (Kita 1990, McNeill 2000) have emphasized certain limited functions: pre-stroke holds are claimed to occur to allow gesture strokes to synchronize with particular speech elements, while post-stroke holds are described as extensions of the stroke itself, which can then terminate after co-expressive speech is fully pronounced. These oft-repeated definitions may have drawn attention away from the myriad other functions that held gestures could conceivably support. McCullough (2005) urges a reorientation toward an examination of *maintenance* functions (e.g. as supported by gesture holds) vs. *transformation* functions (e.g. as supported by punctual gesture strokes).

Surveying a video corpus of 44 dyadic, 10-15 minute conversations of university students speaking American English, I analyzed each instance of a gesture hold for its expressive potential, in the context of the ongoing speech and gesture. Gesture holds span intervals, as do strings of co-expressive speech, and the relative timing of the onsets and offsets of these modalities was found to vary significantly such that three broad categories emerged: (1) Holds which are 'retrospective' and may help maintain a cognitive or perceptual link to a prior moment, by allowing for continuing anaphoric support even as new speech and gestures are performed; (2) Holds which are 'prospective' and precede co-expressive speech by significant margins, presaging full speech-gesture utterances in a manner which suggests pragmatic priming or 'presumptive meaning' effects (Levinson 2000) and implying major differences in the timecourse of comprehension and production of speech with gesture as compared to speech without gesture; (3) Holds which bracket an interval of co-expressive speech at a topical level, unifying it as a coherent whole, suggesting body-based strategies for metricalizing temporal intervals into chunks which can be 'conceptualized as static': i.e., as the 'now'.

Diagrams and References for "Retrospective, prospective, and bracketing functions of gesture holds"



These categories dovetail powerfully with Schutz's (1973) phenomenological concepts of (1) 'because motive' (prior conditions and established ground) and (2) 'in-order-to motive' (intended or impending future), and I argue that the speech-gesture examples manifest these concepts directly in the flesh, rendering them explicit because of the temporal offsets occurring between the elements of the multimodal composite. The third category (3) can be conceptualized as a collapse of the temporal context, in which gesture-related 'because motive' and 'in-order-to motive' are unified and temporarily treated as equal.

Selected video clips will be presented, demonstrating specific subsets inhabiting these broad and sometimes simultaneous conceptual divisions: gesture holds frequently bridge across pauses, interruptions, and moments of disfluency and lexical search, sometimes while floor-holding, and sometimes while 'handing off' to the interlocutor, in ways which are occasionally strikingly 'presaging' of impending speech-gesture content. From postural orientations to extended chains of gesture 'buoys' (see Liddell 2003, Enfield 2009), and with or without clear gesture strokes, holds also perform topical scope across intervals.

References

- Enfield, Nicholas J. 2009. *The Anatomy of Meaning: Speech, Gesture, and Composite utterances*. Cambridge: Cambridge University Press.
- Kita, Sotaro. 1990. The temporal relationship between gesture and speech: A study of Japanese-English bilinguals. Master's thesis, The University of Chicago.
- Levinson, Stephen C. 2000. *Presumptive Meanings: The Theory of Generalized Conversational Implicature*. Cambridge, MA: The MIT Press.
- Liddell, Scott K. 2003. *Grammar, gesture, and meaning in American Sign Language*. Cambridge: Cambridge University Press.
- McCullough, Karl-Erik. 2005. Using gestures during speaking: Self-generating indexical fields. PhD dissertation, The University of Chicago.
- McNeill, David. 2000. Catchments and contexts: non-modular factors in speech and gesture production. In David McNeill (ed.) *Language and Gesture*, 312–328. Cambridge: Cambridge University Press.
- Schutz, Alfred. 1973. *Collected Papers, Vol. 1: The Problem of Social Reality*. Ed. by Maurice Natanson. The Hague: Martinus Nijhoff.

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Event structure constrains gestural viewpoint

When telling stories, people frequently produce gestures in which they use their hands and bodies as though they were a character in the narrative. These so-called character viewpoint gestures (McNeill, 1992) contrast with gestures in which a narrator depicts an event as though observing it (observer viewpoint gestures). Very little is known about the factors that determine which viewpoint a narrator will choose. This study examines a corpus of narrative data in an attempt to shed some light on this question. Our corpus consists of 23 narrations of three different cartoon stimuli, collected under controlled conditions. Each cartoon stimulus was divided into specific events (e.g., a character throws a baseball). Gestures produced by participants were then matched to specific events. We found that certain events evoked only character viewpoint (events involving uses of the character's hands, e.g.), certain events evoked only observer viewpoint gestures (events involving complex trajectories, e.g.), and certain events evoked both. We suggest that event structure—that is, visuo-spatial properties of events and motoric properties of character's actions—largely determines the selection of gestural viewpoint in most cases. We relate these findings to simulation-based models of language production (Barsalou, 2008; Hostetter & Alibali, 2008).

References

- Barsalou, L. W. (2008). Grounded cognition. *Annual Review of Psychology*, 59, 617–645.
 Hostetter, A. B., & Alibali, M. W. (2008). Visible embodiment: Gesture as simulated action. *Psychonomic Bulletin & Review*, 15(3), 495–514.
 McNeill, D. (1992). *Hand and Mind: What Gestures Reveal about Thought*. Chicago: University of Chicago Press.

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Complex conductor gestures in orchestral interaction

The practice of orchestral conducting (within a Western art music tradition) is a highly specialised interactional activity. Conductors use a wide variety of physical movement to direct musicians in both rehearsal and performance. Conductor gesture is particularly important because it allows conductors to communicate with musicians in a physical environment which is not conducive to the use of speech, or even speech + gesture, as a primary mode of interaction. Professional orchestral rehearsal occurs over limited time and involves scores of musicians all contributing to a complex auditory environment. Gesture is a more practical and efficient method of communication in a situation similar to environments which produce alternate kinesic codes (cf. Kendon 2004).

This paper follows the work of Poggi (2002) and Boyes-Braem & Bräm (2000) in examining conductor action from a gesture studies perspective. It is also informed by Haviland's (2007) study of chamber musicians, and situates conductor gesture within the context of interaction during orchestral rehearsal. This paper uses musician responses to conductor gesture, including up-take of specific gestural components (i.e. speed), musician-talk and music performance modifications, to show how conductor gestures may be being understood. This paper shows that examining conductor gesture situated within its interactional context allows musician response to be used as evidence for how gestures are understood and, over sequences of gesture repetition and repair, how conductor gestures are intended to be understood.

The focus of this paper is on gestures that occur across several parts of the conductor's body (including fingers, hands, arms, head, body orientation, face & gaze) simultaneously, termed herein 'Complex Conductor Gestures' (CCGs). This paper argues that CCGs function multi-directionally in interaction by having multiple meanings for different musicians. This paper also argues that conductors achieve these multiple meanings in two ways; firstly by performing two (or more) distinct Complex Gestures which have discrete meanings and are directed at and taken-up by two (or more) separate groups or individuals, and secondly by performing CCGs where musicians take meaning (as seen from musician response) from the entire Complex Gesture but differing contexts across the ensemble for musicians' understanding and interpretation of the entire CCG results in differing musician responses.

This study uses a conversation analytic framework for the analysis of interaction and is also informed by ethnomethodological observation of an orchestra over a period of 4 months. The gestures and other non-verbal behaviours are analyzed using ELAN. The data examined is from a corpus of 22 hours of footage, from 4 digital cameras, of the 82 members of a professional orchestra in rehearsal with a professional conductor collected as part of an ongoing project examining musician interaction.

This study concludes that CCGs can be deployed to achieve multiple meanings and play an important part in musician-conductor interaction during orchestral rehearsal by allowing conductors to efficiently communicate complex and multi-part meanings to multiple groups and individuals simultaneously.

References

- Boyes Braem, P., & Bräm, T. (2000). A pilot study of the expressive gestures used by classical orchestra conductors. In K. Emmorey, & H. Lane (Eds.), *The signs of language revisited*. Mahwah, New Jersey: Lawrence Erlbaum & Associates.
 Haviland, J. (2007). Master speakers, master gesturers. In S. Duncan, J. Cassell, & E. Levy (Eds.), *Gesture and the dynamic dimension of language* (pp. 147–172). Amsterdam: John Benjamins.
 Kendon, A. (2004). *Gesture: Visible action as utterance*. Cambridge: Cambridge University Press.
 Poggi, I. (2002). The lexicon of the conductor's face. In P. McKeivitt, S. Ó Nualláin, & C. Mulvihill (Eds.), *Language, vision and music* (pp. 271–284). Amsterdam: John Benjamins.

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A mother gorilla's flexible use of touch to coordinate movement with her infant: The creation of meaning along a gesture-action continuum

This paper describes and analyzes the tactile directive movements used by a zoo-living mother lowland gorilla with her infant son as they coordinate movement together within their enclosure. The specific aim was to examine how tactile gestures are used within the full scope of meaningful interaction, including special attention to how they are embedded within the context of more forceful, instrumental actions. The data include 22 video-recorded interactions over a two month period in which Bawang—the mother—uses a variety of touches, pushes, grabs, and swings to influence and coordinate with the movement of her 10-11 month old son Barney. The critical observation is that these tactile actions display a wide and flexible range of physical pressure, filling the spectrum from full instrumental force to the lightest of touches. Moreover, qualitative and quantitative analysis show that the degree of instrumental force used by Bawang is contextually motivated by Barney's apparent attitude towards coordinating his movements, and in turn, that Barney demonstrates differential understanding of his mother's directive movements relative to the degree of force she applies.

Previous studies typically begin by making a categorical distinction between tactile gestures and instrumental actions, and then proceed to attend to the identified gestures and discard the actions (Call & Tomasello, 2007; Genty et al., 2009; Tanner & Byrne, 1996). Importantly, by this system, a particular tactile movement is assumed to function wholly as either a gesture or as an instrumental action; it either communicates or it forcibly moves. Consequently, theories for how gestures are created and meaningfully used have largely neglected the role played by the contextual integration of more forceful actions (e.g., Tomasello and colleagues' ontogenetic ritualization account of many great ape gestures; Call & Tomasello, 2007). Attention to this contextual integration is relevant to controversial reports of spontaneously produced iconic gestures and for theories of how action-derived gestures relate to their original action.

In contrast to a categorical distinction between action and gesture, we argue instead that our findings support the notion of a continuous relationship between tactile gestures and instrumental actions. Under our account, certain tactile movements can take a more-or-less forceful form as they emerge online from competing motivations to physically manipulate an interlocutor's behavior with instrumental action and to socially influence that behavior with communication. In the present case, the strength of Bawang's directive movements is considered as a balance of the motivation to maintain a degree of authority and protective control over Barney's movement with the competing motivation to foster in him a certain level of locomotive independence. We discuss how this more continuous account of the relationship between gesture and action is consistent with previous reports of ape iconic gesture (Tanner & Byrne, 1996; Savage-Rumbaugh et al., 1977) and meshes with a recent proposal that human iconic gesture emerges from a process of simulated action (Hostetter & Alibali, 2008).

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Grooming gestures of chimpanzees in the wild: First insights into meaning and function

Chimpanzees' vocalizations are referential, but only functionally (Mitani & Brandt, 1994; Slocombe & Zuberbühler, 2006). Contrary to human linguistic signs – which are used to influence what others know, think, believe, or desire (Grice, 1957) – they don't intentionally provide conspecifics with information (Seyfarth & Cheney, 2003). Contrary, research on gestural abilities of human-reared or language-trained great apes showed that signalers use gestures in intentional and referential ways (Savage-Rumbaugh et al., 1986; Gardner et al., 1989). Furthermore, Pika and Mitani (2006) recently described a distinct gesture, the 'directed scratch', used by adult chimpanzee males in the wild to indicate just where on their bodies they wished to be groomed.

The present study aims to provide further insight on the meaning and function of 'directed scratches' and other related grooming gestures by distinguishing between the perspectives of signalers and receivers (Smith, 1965). Analyzes are based on behavioral observations of ~100 grooming sessions between twenty adult male chimpanzees, collected during June and July 2008 at the Ngogo community, Kibale National Park, Uganda.

The results reveal that chimpanzee signalers use their grooming gestures in flexible, manifold ways to request an intended meaning, which is understood by chimpanzee recipients. "Answers" to these request however vary in relation to rank, age and strength of social bonds between signalers and recipients. These results will be discussed with a special focus on recent theories of gesture acquisition, signal evolution, and cooperation.

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Action modification in adult-child-interaction: On the interplay of gesture, interaction and cognition

Learning is a social and interactional endeavor, in which the learner generally receives support from his/her social environment. Developmental research has demonstrated that – when talking or presenting new actions to their young infants – tutors/adults not only modify their speech, but also their gestures and motions (Brand et al 2002, Fernald & Mazzie 1991). Other studies have suggested that such modifications scaffold children’s acquisition of language and action (Gogate et al 2000, Brand et al 2002). While the parameters of such action modifications have been well investigated (Rohlfing et al 2006, Vollmer et al 2009), studies barely consider (a) the variability in parental behavior, i.e. the fact that not every parent modifies her/his behavior in the same way, and (b) the learner’s reactions in situ and how these might, in turn, shape the tutor’s actions.

In this paper, we assume an interactional perspective (stemming from EM/CA) and propose to investigate how tutors modify their actions and gestures during the course of the interaction and in the light of the recipient’s/infant’s conduct. For a given activity, which concrete actions/gestures/hand trajectories do tutors perform? How are these, moment-by-moment, shaped with regard to the recipient’s feedback? And how might their concrete performance invite specific forms of recipient action?

Our analysis will be based on videotaped data from a semi-experimental setting, in which parents were asked to present a set of 10 manipulative tasks both to their infant and to another adult. The corpus comprises 64 groups of participants stemming from three different age groups: (i) pre-lexical infants (8 to 11 months old), (ii) early lexical infants (12 to 24 months), (iii) advanced lexical infants (25-30 months). – In an initial investigation we have been able to show – on the basis of a small data set of the pre-lexical infants (8 to 11 months) – a loop between the tutor’s/adult’s manual actions and the recipient’s/infant’s gaze: the infant’s gazing behavior is consequential for the concrete ways in which the adult’s hand trajectories are shaped both in space and time (Pitsch et al 2009). Based on this, we will now extend our scope of analysis towards (a) a larger data sample investigating all three different age groups and (b) linking qualitative and quantitative analysis. In doing this, we will need to take into consideration – beyond the recipient’s ‘gaze’ behavior as in pre-lexical infants – the different stages of the infants’ cognitive development as they exist in the three different age groups and how these transpire in the concrete interaction, i.e. the feedback the infants are able to give and how the tutors deal with it when performing their actions and gestures. On a methodological level, we will use a combination of (i) qualitative investigation derived from ethnomethodological Conversation Analysis, (ii) semi-automatic computational 2D hand tracking and (iii) quantification.

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Vagueness in gesture, face and gaze

This work describes a type of gestures used during discourse that we call “gestures of vagueness”. Take this narration of a Tweety and Sylvester cartoon:

She’s nitting a sweater uhm that’s funny because his fur becomes part of the yarn so she’s making a sweater with the cat’s fur and then he realizes that he’s loosing his fur and pulls back his fur and the yarn and comes out of the yarn basket with a uhm tricoloured uhm outfit.

In synchrony with *uhm tricoloured*, the subject repeatedly rotates her right hand open. The gesture is performed in a loose manner, with a low muscular tension, and means: “I am vague in what I am saying because the specific details of the topic I refer to are not important for ongoing narration”.

In cognitive terms, vagueness means that the beliefs we assume about a certain topic only concern general and not specific aspects of it. Vagueness is the opposite of precision, that implies conveying beliefs about each specific aspect of a topic; but it also differs from ambiguity. An ambiguous utterance can be interpreted in two or more different ways; we do not know which to assume, but once we decided – once ambiguity is resolved – that belief is specific and precise. In vagueness the belief we assume is only one, but concerns a general class of things, not specific examples or subclasses of it.

Since in narration we are bound to the Gricean norms of quality and quantity, that impose to tell not more nor less than what is relevant, when we can’t or don’t want to go into details we sometimes meta-communicate we are not precise, implying we can afford doing so because details are not necessary for understanding the bulk of our discourse. We may do so by gestures, gaze or facial expression, thus informing both on the certainty (precision) of our beliefs and on the relative importance of information in the structure of our discourse.

A facial signal of “vagueness” is the grimace of pressing lower lips on upper lips, with lip corners downward, that means “I don’t know”. In gaze, briefly and softly closing eyes, possibly while moving head horizontally, means: “I can pass over this”.

Gestures conveying vagueness generally share the following features:

1. the handshape is generally one of the most basic and easy ones
2. the movement trajectory is generally curve
3. the gesture may have two opposite rhythms: either very fast with brief amplitude, or soft with very low tension
4. it tends to be repeated, possibly assuming a cyclic form in the shape of a circle
5. it is produced with low muscular tension.

These motor features provide a cue that the gesturer attributes a low importance to being precise in the beliefs simultaneously conveyed by words, as if telling: “I am relaxed, not tense, since speaking of this is not very important”.

Our work analyses some gestures of vagueness, aiming to characterise their nature and function.

References

- Kendon, A. (1995). Gestures as Illocutionary and Discourse Structure Markers in Southern Italian Conversation, *Journal of Pragmatics*, 23, 247–279.
- McNeill, D., & Levy, E. T. (1993). Cohesion in gesture. *Discourse Processes*, 16, 363–386.
- Poggi, I., Pelachaud, C., & Magno Caldognetto, E. (2003). Gestural Mind Markers in ECAs. Poster at the 2nd International Joint Conference on Autonomous Agents & Multimodal Agent Systems, Melbourne, 14–18 July, 2003.

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Gestures producing art: Some remarks on expressive movements as elements of aesthetics of production in Fiedler and Musil

Without any doubt gestures can be part of a communicative function. But beforehand gestures have to be classified as phenomena of expression. Their mode of appearance as an embodied movement is marked by a tension towards general linguistic and communicative abilities. Gestures occur in the wide field between clear and distinct articulation on the one hand and the “void of expression” (*das Ausdruckslose* according to Richard Wagner, Th. W. Adorno, Gottfried Boehm) or the “Unshaped” (*das Gestaltlose* as Robert Musil puts it) on the other. Focussing gestures as liminal phenomena one has to analyse the conditions and circumstances that will turn a mere body movement into significance. How do perceptible configurations transmute into phenomena of expression associated with sense, meaning, understanding and communication, intentionality and readability? Within this transitional zone containing both minimum detectable signals, slight suggestions and blurred traces as well as articulate utterances belonging to language and communication the aesthetic competence plays a decisive role.

By taking up the “iconic difference” (Boehm) which causes permanent disturbance in any perceptive figuration and challenges one's faculty of interpretation I will address the “Ausdrucksbewegung der Hand” (expressive movement of the hand) of the artist according to Konrad Fiedler's theoretical writings on art. In his view works of art owe their value of expression to the process of formation rather than the final outcome. Instead of the topic of the representation there has to be a reflection on the historical and media-technological conditions of its origin. The significance of “Ausdrucksbewegung” is an effect of a complex constellation in terms of producing, restoring, distributing and receiving art. These constellations can't be by no means brought back to a single but general schema. Therefore this paper will stress the gesture not as subject matter of art but as an element of producing art by comparing several models (amongst others Fiedler's and Musil's) of crossing the area from the amorphous, unexpressed, insignificant to shape, expression and meaning.

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Hands, objects and courses of action: How handshape in handling object can be interactionally relevant

In road traffic, a vehicle's position and orientation are major cues to the driver's intention (or lack of intention). As such, what someone is doing with an object can inform others about how they might participate in the unfolding course of action that that person is engaged in. Unlike the control of a vehicle, in the case of objects that are literally handled (that is objects that are manipulated manually, by the hands), properties of the hands themselves, such as finger positions, can become relevant (Streeck, 2009). In such settings, it is not just that hands reflect key aspects of what a speaker is doing (McNeill, 1992) but that the properties of an object (e.g. its shape or position) can become a field within which the hand(s) operate (Goodwin, 2000). Whilst previous research has examined how participants' talk, gaze and gestures can all be relevant for co-participants (e.g. Bolden, 2003) the focus of the present analysis is on manual configurations specifically.

This present paper aims to make a contribution to our understanding of how the position of the hands, in handling objects, can make available to others what an agent is doing, more specifically, how features of the course of action that an agent is engaged in can become available to others. We use Conversation Analysis to examine the social organization of manual object handling in video-recordings of several hours of naturally-occurring domestic interactions, in particular involving adult human participants engaged in the assembly of flat-pack furniture.

We show how configurations of the hand, such as finger positions, are oriented to by co-participants, in particular how they can make available for them the course of action that an agent is engaged in.

We discuss the evolutionary importance of co-present, object-focused interactions and how such settings are probably the primordial site of language development (both phylogenetically and ontogenetically). We consider the importance, for co-participants in such settings, of monitoring each other's hands (rather than their faces) and conclude by discussing the relevance of the visibility of hand-object configurations in telecommunication and virtual reality applications.

References

- Bolden, G. (2003). Multiple modalities in collaborative turn sequences. *Gesture*, 3, 187–212.
- Goodwin (2000). Action and Embodiment Within Situated Human Interaction. *Journal of Pragmatics*, 32, 1489–522.
- McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago: University of Chicago Press.
- Streeck, J. (2009). *Gesturcraft: The manu-facture of meaning*. Amsterdam/Philadelphia: John Benjamins.

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Integrating the gesture – Cognitive semiotics in Indian performing arts

Natyasastra (Bharata, ca. 3 BC) is the earliest known Indian treatise on performing arts, *Natya*, and deals with the representation of expression found in the world. Such representation has been coined *Abhinaya*, roughly meaning the transmission, face to face, of that which is made obtainable. Four modes of representation through body, speech, ornamentation and an inner conceptual disposition have been classified. Bodily representation, *angika abhinaya*, involves an extensive use of gestures seen even today in the dance and dance theatre traditions in India. While articulation with various limbs, like hands, eyes, waist/hips, neck, head, etc., have been considered as gestures and discussed in the *Natyasastra*, it is the use of hands, the hasta, that became the most perceivable and prominent representation of physical expression. Hand shapes used for this purpose have become conventionalized through long practice and their description in many ancient treatises, often leading to the notion that their usage is culturally specific and prescriptive. However, in the practiced living tradition of performing arts in India, the execution of hand gestures to convey meaning in any given context depends upon their integration into a multimodal system of body communication, where gestures of all the so-called main limbs, *angas*, are used. The integrative use of the gestures has to be conceived in such a way as to bring forth various levels of meaning such as and not limited to textual, emotional, cognitive or spiritual. During a performance, gestures are thus re-created constantly in ever new combinations to enable a meaning construction that in turn finally integrates all these levels. Though using conventionalized forms, the performer has a range of improvisational freedom, which lies between his or her creative ability to use imagery to construct meaning and the communicative impact, *siddhi*, to be achieved. Therefore a comparative study using essential concepts from current gesture research such as similarity, contiguity and conventionality (Mittelberg), proximity of language in shaping gesture imagery (McNeill), notions of multimodality in body communication, current discoveries in co-speech gestures, namely mimetic modes (Müller et al. in prep) termed Modes of Representation, MoR, which analyze criteria that lead to the execution of gestures and describe the origins of gestures in mundane everyday practices of the hand and finally a form based analysis of hand gestures using principles of Laban Movement Analysis and Bartenieff Fundamentals, a multi-layered Western movement analytic system providing tools for movement execution, observation and analysis, which analyzes the integrative processes involved in the construction of the above mentioned levels of meaning in the Indian performative context, would enable an examination of both meta-cultural components and cognitive semiotics in Indian performing arts. The paper proposes to present such an analysis of illustrated examples from a performative context drawn from the process of meaning construction involved in the unfolding of the story of Iphigenie in the staging of the dance theatre “Goethe’s Iphigenie”. The four modes of representation defined in the Indian performing context, viz., a) spoken/sung expression, *vachika abhinaya*, here the original German text b) corporeal representation, *angika abhinaya*, here the Indian gestural tradition c) expression through costumes, *aharya abhinaya*, here a blend of Indian and Greek dress traditions and finally d) the inner conceptualization, *satvika abhinaya*, here the ability of the performers to feel into the role of Iphigenie in their respective performative traditions, are integrated from an intercultural perspective. The implications to both gesture research and Indian performing traditions lie in the enormous congruity found in the theoretical framework of linguistic discoveries and practice of gestural representation in performing arts.

(See also R. Ramesh’s lecture performance on Wednesday evening)

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The gestural realization of some grammatical features in Russian

Co-speech gestures have been the focus of linguistic research in several languages already, in English (McNeill 1992, Kendon 2004) or German (Holle 2007), but also in comparative studies (Müller 1998). The research on slavonic languages has so far mostly been on gestures substituting speech. The work by Krejdlin for Russian mainly focuses on emblems and shows that these gestures may overlap between cultures, but are also culture as well as language specific.

Metaphoric and iconic gestures as differentiated by McNeill (1992) play a central role while people are producing spontaneous speech. However, as several research studies demonstrate, beats and batons seem to be of specific importance for speech production in spontaneous speech, which leads to questions concerning the structuring of oral texts.

Russian as an intonation language shows the typical parameters of intonation (e.g. accentuation, speech melody, declination). Accentuation including reduction plays a significant role in Russian. In a study on the co-occurrence of accents and gestures, not only speech production, but also speech perception has to be focused. This is particularly important because most phonetic and nonverbal processes are beyond awareness. For Russian (and also for other languages), it seems likely that accentuation is perceived prosodically as well as nonverbally (cf. Swerts/Krahmer 2008).

A further subject of investigation is the modification of verbs by aktionsarten. In Russian, we find at least ten different kinds of grammatically differentiated aktionsarten that in their spatial/non-spatial reading can also be transferred by nonverbal means (cf. Müller 2000). Such gestural transfer of different kinds of aktionsarten shall be described precisely, so that the realization of the gestures can be compared to the verbal realization and thus the cognitive basis of such rather grammatical gestures shall be determined.

It is especially interesting to see how grammatical phenomena are realized by gestures (and facial expressions). By looking at authentic Russian examples taken from TV debates and interviews that are accessible via the internet we will investigate both the prosodic structure and the co-occurring gestures of the speech samples. We found in those speech samples the use of such gestures accompanying and substituting the verbal realization of aktionsarten, like a hopping movement of a hand in one example where there is no aktionsart realized verbally. Does the large amount of aktionsarten in Russian mean that they are more often realized by gestures than in other languages?

The grammatical phenomenon of negation shall be analysed as well. In example (1) (it cannot pay) where a speaker is uttering negation gesturally he is using an emblem-like gesture (sweeping movement performed with two hands held horizontally) not only to underline the negation but also to announce it in the first place. The gesture starts shortly before [pla-], which is definitely before the negation particle and thus the negation is produced nonverbally before its verbal realization.

Russian is grammatically so interesting that a detailed analysis of co-speech gestures might offer new insights into speech production processes.

(1) platit’ ne mozhet
payINF NEG can3psgpres

References

- Holle, H. (2007) *The comprehension of co-speech iconic gestures: behavioral, electrophysiological & neuroimaging studies*. Lpz.
Kendon, A. (2004) *Gesture: visible action as utterance*. Cambridge.
McNeill, D. (1992) *Hand & mind: What gestures reveal about thought*. Chicago.
Müller, C. (1998) *Redebegleitende Gesten: Kulturgeschichte – Theorie – Sprachvergleich*. Berlin.

- Müller, C. (2000) Zeit als Raum: Eine kognitiv-semantische Mikroanalyse des sprachlichen & gestischen Ausdrucks von Aktionsarten. In: Hess-Lüttich, E. et al. (Hg.) *Botschaften verstehen*. Frankfurt/Main.
- Swerts, M./E. Krahmer (2008) Facial expression & prosodic prominence: effects of modality & facial area. In: *J Phon* 36, 219–38.

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How to disagree on a church window's shape gesturally. Typology-based explanations for meta-communicative acts in MM dialogue

The relation of gesture to dialogue structure has so far not been a prominent topic in gesture research, an exception being the research of Bavelas et al. The classical typology into gesture categories like iconic, indexical and so on fares quite well, at least if we consider single contributions, turns or propositions. If, however, we inspect first, second and third turn positions in dialogue, say, from a Sacks-Schegloff-Jefferson perspective, we better move from a categorial view on gesture to a more functional one. This is the methodology I want to suggest in this talk which has four sections: to illustrate the gesture-dialogue relation, I first discuss an example (translated into English) from the Bielefeld Speech-And-Gesture-Alignment corpus (SAGA), where a Router reports his car ride through a virtual town to a Follower. Somewhere in the dialogue, the Follower recapitulates the Router's description of a particular church:

Follower: The windows of the church with the round roof, they were typical church windows, too. Well, square, round. (two-handed drawing gesture starting with bottom of church window and proceeding to top).

Router: Exactly, it had mainly windows towards the bottom. These were simply these church windows. Simply, straight at the bottom and kind of pointed at the top. (two-handed drawing gesture for gothic church window).

The Follower's ellipsis starting with *Well* can only be understood if interfaced with her gesture. The gesture specifies where exactly squareness and roundness reside. Hence, it provides complementary information. The Router's use of gesture is perfectly aligned with his speech. His speech AND gesture also contain a repair, kind of pointed substitutes for round. Why is the Router's gesture essentially similar to the Follower's? Why will his repair work? This may be due to a convention for signing church-windows or due to an act of ad-hoc alignment. Both versions lead to the problem that specific gesture shapes co-occurring with speech can be equipped with specific meaning. Issues like these will lead us to conventionalisation, gesture typology and partial ontology.

Secondly, I briefly explain the typology model for the SAGA corpus, roughly a multiple inheritance hierarchy and an associated partial ontology specifying the semantics of gesture constituents and gestural wholes. The multiple inheritance hierarchy contains entities based on gesture morphology. These are single features like hand-shape, wrist-movement and others, then objects of various dimensions ranking from 0 to three and, finally, composites of objects of same or different dimensions. For example, idealizing somewhat, the church-window gesture consists of an "open" cuboid and a triangular prism grafted onto it.

In the last section it is shown how the information coming from the gesture typology interfaces with verbal meaning. It interfaces with the propositional information contained in the contributions of the dialogue passage and the dialogue structure, especially the meta-communicative grounding action. The repair gesture leads to down-dating the information of the Follower and to achieve grounding, i.e. mutual belief among Follower and Router about the church window's shape.

References

- Bavelas, J., Chovil, N., Coates, L., Roe, L. (1995). Gestures Specialized for Dialogue. In: *PSPB*, Vol. 21 No. 4, pp. 394–405.
- Rieser, H.: On Factoring out a Gesture Typology from the Bielefeld Speech-And-Gesture-Alignment Corpus (SAGA). In: *Proceedings of GW 2009*, (to appear 2010).
- Rieser, H., & Poesio, M. (2009). Interactive Gesture in Dialogue: a PTT Model. In P. Healey et al. (Eds.), *Proceedings of the SIGDIAL 2009 Conference* (pp. 87–96). London, UK: ACL.

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Corpus-based gesture typology

Questions of gesture typology have always been a topic in the literature on gestures co-occurring with speech, see for example Kendon (2004). However, the situation for typology work in this field has drastically changed due to annotated MM corpora based on sophisticated data acquisition techniques and the application of statistical methods. We report about joint work on gesture typology in the Bielefeld CRC 673, Alignment in Communication, starting with our corpus. Then we go into the technology developed for gesture investigation, called grid-technology. In the sequel, the statistical underpinning for a typology of the whole corpus is given. Finally, we show the use of statistics-based typology and partial ontology in the description of a MM dialogue.

Our typology work is based on the Bielefeld Speech-And-Gesture-Alignment corpus, SAGA. It comprises 25 MM dialogues, route and landmark descriptions of a sight-seeing tour through a virtual town given by a Router to a Follower. The dialogues are video-filmed and recorded using speech recordings, body-tracking techniques and eye-tracking. Of the corpus containing some 6000 gestures, roughly 5000 have been annotated in ELAN. Annotation is carried out inter alia with respect to agents, hands and features for e.g. hand-shape. The annotation is manual-based and has been rated, (agreement score 75%).

The annotation features provide the basis for the typology set up in two steps:

In the first step, a complete typological grid is developed for one video film (see Rieser 2010) as follows: The features originating from the annotation are grouped into single features, feature complexes, and objects of various dimensions. The grouping is motivated by gesture identity conditions and considerations of compositionality, i.e. by observations concerning which feature bundles are recurring in the grid-datum. Obviously, the feature configurations have to have a specifiable distribution. They are assembled in a multiple inheritance hierarchy using a special graph-theoretical tool. Independently, every feature configuration is mapped onto a partial ontology description giving its semantics: A gesture using specific hand-shape, wrist-movement, palm-direction, and back-of-hand-direction can depict a cylinder partially. Depictional content can in turn interface with the lexical semantics of the noun "tower".

The second step takes the typological grid as a hypothesis for the whole SAGA corpus. Using up-to-date statistical methods it checks, how the categories set up for the grid are distributed in SAGA (henceforth "SAGA-groupings"). The statistics uses only gesture morphology, it does not incorporate partial ontology. As a consequence, we get an independent estimate as to whether some partial ontology description newly stipulated for a SAGA-grouping matches the partial ontology attributed to a grid item, for example, whether a configuration of gesture features in the grid partially depicts a particular entity in the WHOLE SAGA corpus.

Finally, gesture typology is put to work: using a two-turn exchange of a MM dialogue, two things are shown: the interface of gesture meaning and verbal meaning yielding MM propositions and the function of gesture meaning for dialogue management.

References

- Kendon, A.: *Gesture: Visible Action as Utterance*. CUP, (2004)
Rieser, H.: On Factoring out a Gesture Typology from the Bielefeld Speech-And-Gesture-Alignment Corpus (SAGA). In: Proceedings of GW 2009, (to appear 2010).
Rieser, H., & Poesio, M. (2009). Interactive Gesture in Dialogue: a PTT Model. In P. Healey et al. (Eds.), *Proceedings of the SIGDIAL 2009 Conference* (pp. 87–96). London, UK: ACL.

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Dance and spaces: Multimodal metaphors for emotions, interpersonal relations, and society

This paper is about the creation of spaces and multimodal metaphors in a contemporary dance performance from Rui Horta.

The way people position themselves in relation to one another in space and the different spaces in interaction they create convey relevant cues for the interpretation of both interpersonal relations and the engagement and disengagement in interaction/conversation. These aspects were considered in the turn-taking rules, in the descriptions of the rights and obligations attached to the roles of speaker and hearer in a conversation and in other regulating principles for conversation.

The positioning of interacting people in space has been the object of research of some scholars, such as Hall (1969) and Kendon (1990), more recently Haviland (2000), Özyürek (2002), Sweetser/Sizemore (2006). Kendon (1990) observed the occupation of space in multiparty conversations in time and uses the expression F-formation system to describe the way participants adjust their positions in relation to each other during face-to-face interactions. This kind of studies is now being pursued in the I.A., for the development of embodied agents, such as Tapus/Mataric (2007).

Categories like Kendon's F-formation system, o-space and face-address system, or different classifications by others for personal space, gesture space and interactional space represent the theoretical background for the description of the relation between body movements, speech and position in space.

The analysis of dancers' body movements and of the spaces they create (or not) is a way to find out how the choreographer uses proxemics to express abstractions like freedom, standardized society, as well as emotions (Camurri et al., 2003) in relations between the single and the group.

These concepts correspond to the theme of the performance, according to Horta, the idea of space for freedom and for singularity in the standardized society. The oscillations between distance and body contact function as concrete representations for the a.m. abstract dimensions, i.e., as metaphors. Furthermore, movements taken from the video material recorded during the creation processes of Horta will be interpreted with the background of conventional vs. idiosyncratic metaphor and multimodal metaphor (Müller/Cienki, 2009). Understanding that metaphor occurs in other modes than language alone, the analysis of metaphors on dance videos will be framed within the Multimodal Metaphor theory as presented on Forceville/Urios-Aparisi (2009). We suggest that conceptual metaphors find expression in the dance movements themselves, and indeed in some visual sign used by the choreographer, in ways that are not always translatable into language. They may be taken, as "direct" manifestations of the conceptual metaphors unmediated by language.

References

- Camurri, A./Lagerlöf, I., Volpe, G. (2003) "Recognizing emotion from dance movement". In: *Int. J. Human Computer Studies*, 59, 213–225.
Forceville, C./Urios-Aparisi, E. (2009) *Multimodal Metaphor*. Berlin, de Gruyter.
Hall, E. (1966) *The Hidden Dimension*. New York, Doubleday.
Haviland, J. (2000) "Pointing, gesture spaces and mental maps". In: McNeill, D. (ed.) *Language and Gesture*. Cambridge, CUP.
Kendon, Adam (1990) *Conducting Interaction*. Cambridge, CUP.
Müller, C./Cienki, A. (2009) "Words, Gestures and beyond". In: Forceville, C./Urios-Aparisi (eds.) *Multimodal Metaphor*, Berlin, de Gruyter, 297–328.
Özyürek, A. (2002) "Do speakers design their co-speech gestures for their addressees?". In: *J. of Memory and*

Language 46, 688–704.

- Sweetser, E., Sizemore, M. (2006) "Personal and interpersonal gesture spaces". In: Tyler, A., Kim, Y. Takada, M. (eds.), *Language in the Context of Use*. Berlin, Gruyter, Berlin, 31–58.
- Tapus, A./ Mataric, M. (2007) "Socially assistive robots: the link between personality, empathy, physiological signals and task performance". In: <http://www.aai.org/Papers/Symposia/Spring/2008/SS-08-04/SS08-04-021.pdf>, (15.12.2009).

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The facial expression of anger in Ancient Rome

The objective of this paper is to analyse the facial gestures that expressed the sentiment of anger in the culture of Ancient Rome.

There are many difficulties involved in conducting a study of gestures in the realm of a now-defunct civilisation without any speakers that can be observed. For obvious reasons, the study of gestures in the Roman world cannot be carried out through the direct observation of behaviours and must be based solely on sources that encompass two complementary fields: on the one hand, literary testimonies, and on the other, iconographs extracted from Roman sculpture, architecture and painting.

After analysing the sources, we found that Roman writers observed in detail the behaviour of angry subjects, especially Seneca, who dedicated a treatise precisely to anger and recorded in his works a large number of facial gestures that he considered manifestations of this sentiment, such as furrowed brows, rolling eyes, inflated nostrils, pursed and bitten lips, grinding teeth, etc.

Nonverbal acts indisputably constitute a key and characteristic part of each culture at the same communicative level as verbal acts. These nonverbal acts are part of our cultural heritage. They have been passed down from generation to generation since antiquity and largely reference Ancient Rome, as do Romanic languages. Thus, at the same time that the Romans passed down their language –Latin–, they also passed down an entire series of non-verbal elements in such a way that idiomatic and cultural integration also involved gestural integration.

Certainly, all studies on non-verbal communication have always underscored the "cultural" character of most nonverbal messages. Thus, Latin philology must also have a place in research on gestures, not only because the analysis of gestures in Ancient Rome –inasmuch as gesture is not a universal resource, but rather is culturally moulded– is an indispensable part of the study of Roman culture, but also because its study can help understand the cultural dimensions of contemporary forms of non-verbal communication and place them in their historical context.

Therefore, it is necessary to establish a repertoire of gestures in Ancient Roman and to this end, a group of professors at the University of Barcelona and the University of Balearic Islands are devoting our research work, for example:

References

- "Rascar-se l'orella i altres gestos per l'estil", *Ciència, didàctica i funció social dels estudis clàssics* (B. Usobiaga – P.J. Quetglas, eds.), Barcelona 2004, 207–218;
- "La gestualidad facial según los textos latinos: gestos realizados con la boca", *La Filología Latina. Mil años más* (P.P. Conde Parrado–I. Velázquez, eds.), Madrid 2005, 330–357;
- "Los gestos de burla en la Roma antigua y hoy", *Minerva. Revista de Filología Clásica* 18, 2005, 137–151;
- "La gestualidad de la barba y el mentón en la Antigüedad romana" *Revista de Estudios Latinos* 5, 2005, 175–192;
- "El beso al moribundo" y "El beso a distancia según los textos latinos", *Actas del XI Congreso de la Sociedad Española de Estudios Clásicos*, Madrid 2005, vol. II, 919–926;
- "Los gestos con el pulgar en los combates de gladiadores", *Latomus* 65,4, 2006, 963–971;
- El porqué de nuestros gestos. La Roma de ayer en la gestualidad de hoy*, Barcelona 2008.
- Also M. Puig, "La gestualidad facial según los textos latinos: gestos y maneras asociados a la nariz", *Latomus* 66, 2007, 67–79.

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Conceptualization of time via hand gestures: Case study of Patau syndrome

In this research we will look at the relationship between hand gestures and meaning construction in communicative situations (e.g. Goodwin 2003a, 2003b). We will focus particularly on communication possibilities of an 18-year-old girl with the mosaic variant of Patau syndrome and her communication using hand gestures and contextual information.

Our theoretical framework follows contemporary approaches to linguistic and cognitive research. In addition to spoken language communicative situation includes also bodily movements of the communicators – body posture, gaze, and hand movements (e.g. Kendon 1986, 1995, 2004, Streeck 1988, Streeck and Knapp 1992).

Our subject's speech is disturbed due to motor dysphasia, a disturbance of speech caused by organic damage of the speech centres of the cerebral cortex. Majority of her communication proceeds thus by hand and head movements accompanied by specific sounds.

We have reported in the case study subject's ability to understand and to create the concept of time via hand gestures. We will demonstrate in our study how communicative functions of subject's gestures get understood in the context and translated into verbal utterances by the partners.

The material has been recorded with a video camera and analyzed in detail. Without further studies it is difficult to hypothesize how language is actually presented in subject's perceptions. However, we can say that her language comprehension area in the brain is obviously under control, although her ability to impart speech is missing. At this point we need to take into consideration the relation between human cognition and brain activity (e.g. Damasio 1994, 1999, cf. Rizzolatti and Arbib 1998). This also supports linguistic views regarding the way symbols that human beings construct emerge from forms of experience that have a crucial embodied component (Johnson 1987; Lakoff and Johnson 1999).

The results of the analysis of subject's communicative behaviour can also help to understand the working mechanisms of cognitive abilities and human perceptual processes in a broader sense.

References

- Damasio, A. (1994). *Descartes' Error: Emotion Reason, and the Human Brain*. New York: Grosset/ G. P. Putnam's Sons.
- Damasio, A. (1999). *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. New York, San Diego, London: Harcourt Brace & Company.
- Goodwin, C. (2003a). Introduction. In C. Goodwin (Ed.), *Conversation and Brain Damage* (pp. 3–20). Oxford: Oxford University Press.
- Goodwin, C. (2003b). Conversational Frameworks for the Accomplishment of Meaning in Aphasia. In C. Goodwin (Ed.), *Conversation and Brain Damage* (pp. 90–116). Oxford: Oxford University Press.
- Johnson, M. (1987). *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. Chicago: University of Chicago Press.
- Kendon, A. (1986). Current Issues in the Study of Gesture. In J.-L. Nespoulous, P. Perron, & A. Roch Lecours (Eds.), *The Biological Foundations of Gestures* (pp. 23–48). Hillsdale N.Y.: Lawrence Erlbaum Associates.
- Kendon, A. (1995). Gestures as illocutionary and discourse structure markers in Southern Italian conversation. *Journal of Pragmatics*, 23(3), 247–279.
- Kendon, A. (2004). *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Lakoff, G., & Johnson, M. (1999). *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.
- Rizzolatti, G., & Arbib, M. A. (1998). Language Within Our Grasp. *Neuroscience* 21(5), 188–194.
- Streeck, J. (1988). The Significance of Gesture: How it is Established. *IPRA Papers in Pragmatics*, 2(1), 60–83.
- Streeck, J., & Knapp, M. L. (1992). The Interaction of Visual and Verbal Features in Human Communication. In F. Poyatos (Ed.), *Advances in Nonverbal Communication* (3–24). Amsterdam, Philadelphia: John Benjamins Publishing Co.

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Design principles for gestures in man-machine-interaction

In engineering sometimes any movement that is produced with the intention to cause some effect is called a gesture. Only those which are performed to transmit messages are considered as gestures in the social sciences, and this is the meaning with which the word / gesture/ will be used here.

Gestural man-machine-dialogs suffer from the same problem as written or spoken ones, namely from the necessity of completely memorizing and recalling the proper expressions. Interaction designers strive to attenuate this problem by employing gestures which they think are especially “intuitive” or “natural”. The concepts of intuitiveness and naturalness probably both refer to what is called a motivated sign in Saussurean semiotics. This means that the association between a gesture and what is meant with it is either based on some similarity (iconic sign) or on some physical or logical connection (indexical sign) between the spatiotemporal form of the gesture and its referent.

Dialog based man-machine-interaction consists of communicative acts, which are in many cases of the directive kind (“Delete this file!”). In every communicative act three units of information must be explicitly or implicitly transmitted, namely the type of act (assertive, declarative, directive, expressive, commissive or a subclass of these), a referent and a predicate for this referent. In the file deletion example those information units can be made explicit by reformulating the act in a form like “Herewith I order that [= directive] this file [= referent] is deleted [= predicate]”.

It is convenient to encode only one of these components in the gesture itself, and to make the other two obvious from the context. In that case the gesture only needs to refer to an object or a process or state that applies to that object. For example, if a media player application is running in the foreground, then a gesture specifying the goal state “open” is sufficient, because only a command is permitted and it is clear that the referent is an audio or video file. Three design rules can be formulated for such situations:

1. Because in many cases the object or process or state to be represented by the gesture is abstract or invisible a suitable conceptual metaphor must be found for it.
2. One should try to directly represent the source of the metaphor through a gesture.
3. If a direct representation seems infeasible then the shortest possible chain of references should be constructed, starting with some iconic representation, in which the hands draw or model or embody a shape and/or imitate a movement. The thus represented object or movement should refer through synecdoche or metonymy to another entity, and this should be repeated until the desired referent is finally reached.

For example to stop a video a hand movement as if warding something off could be made. The hand motion would be an iconic sign for the real movement, and this movement would be a synecdochal (pars pro toto) expression for stopping something.

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Pointing gesture as a syntactic element

Polish Sign Language (Polski Język Migowy, hereinafter PSL) is an understudied natural sign language used by the Deaf community in Poland. The aim of the present paper is to discuss the role of pointing in the grammar of that language. I address this issue by examining the grammatical properties of PSL pronouns.

One of the most characteristic typological features of sign languages around the world is a close relationship between indexical pointing and pronominality. The aim of this paper is to discuss some arguments for treating the pointing sign (an index handshape directed to a point in the signing space) as a grammaticalized linguistic element, rather than mere gesturing. Note that there are several signs that could be interpreted as personal pronouns in PSL: “I” (an index handshape directed towards the speaker), “you” (an index handshape directed towards the person spoken to), “he/she/it” (an index handshape directed towards one of a potentially infinite number of points in the signing space, previously associated with the referent in question). However, the fact that all these signs are based on the same handshape makes me assume that they are contextual forms of the same demonstrative pronoun, which is the only pronoun that PSL has. By proposing this analysis, I attempt to take a position in one of the most important debates in contemporary sign linguistics. According to many researchers (e.g. Emmorey (2002)), sign languages have personal pronouns inflected for person and number. Meier (1990) argues that sign languages have a two-person pronominal system – first and non-first: first person has a default location (center of the chest), whereas for second/third person there is no single default location. He also assumes that locations used for non-first person reference are nonlistable (fully gradient – the signer can point to anywhere in the environment), which makes them impossible to analyze in terms of linguistic features. Liddell (2003), on the other hand, assumes that the use of space for pointing is purely gestural (gradient) rather than linguistic, which in turn means that all pronouns are simply deictic points (pronouns “point to” their referents in the same way as hearing people point to locations while gesturing). My point of view is different: I follow Liddell (2003) in assuming that there are no reasons to distinguish first and non-first person; I show that even “first-person” pronouns may be subject to displacement, e.g. when telling a story about oneself; however, this does not mean that pointing is nonlinguistic. The pointing sign is a pronominal element but, unlike its counterparts in spoken languages, it is not associated with person features. The only formal feature associated with the pointing sign is that of referentiality (therefore, it resembles definite articles in spoken languages). The sign in question enters into a two-directional matching relation with the context (the signing space), thus being provided with a semantic value. Therefore, the signing space becomes a kind of grammatical feature, unparalleled in spoken languages.

References

- Diessel, Holger (2006), “Demonstratives,” in: Keith Brown (ed.), *Encyclopedia of Language & Linguistics*, Oxford: Elsevier, pp. 430–435.
- Emmorey, Karen (2002), *Language, cognition, and the brain: Insights from sign language research*, Mahwah, NJ: Lawrence Erlbaum Associates.
- Liddell, Scott K. (2003), *Grammar, gesture, and meaning in American Sign Language*, Cambridge: Cambridge University Press.
- Meier, Richard P. (1990), “Person deixis in ASL,” in: Susan D. Fischer and Patricia Siple (eds.), *Theoretical issues in sign language Research, vol. 1: Linguistics*, Chicago: University of Chicago Press, pp. 175–190.

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Gesture production in an animation narration task by Chinese-Japanese bilinguals: A near-infrared spectroscopy study

Introduction: Gestures are produced for listeners to decode message and for speakers to encode information. Bilinguals need more encoding work in their second language (L2) than in their first language (L1). Gestures are classified into two categories: “Representational gestures” which depict the semantic content of speech, and “beats” which are simple, rhythmic movements with no symbolic referent. Marcos (1979) found that the gesture rate in L2 was significantly higher than in L1 for beats, but not for representational gestures. Most neuroimaging studies have focused on gesture perception due to strict motion restriction (Dick et al., 2009). To examine the role of gesture production in an animation narration task in L2, we measured the brain activity of bilinguals using near-infrared spectroscopy (NIRS) which imposes few physical constraints on participants.

Method: Sixteen Chinese-Japanese bilinguals watched two separate stories of the Pingu (a famous penguin) animated cartoon series and then narrated the contents in L1 and L2, respectively. The order of language conditions and stories were counterbalanced across participants. We focused on the changes in the concentration of oxygenated hemoglobin (Coxy-Hb) measured by a 48-channel NIRS unit.

Results: We confirmed the results that nonverbal behavior (gestures) has a function in the central processing of information (in L2) reported by Marcos (1979).

Ten participants were included in a further NIRS analysis, five (gesture group) gestured in both L1 and L2, and the other five (no-gesture group) gestured in neither L1 nor L2. The average change in the Coxy-Hb of three 2s-measurement periods consisted of a pre-gesture (pre-G), a gesture (G), and a post-gesture (post-G) was calculated for each channel.

A 2-group (gesture, no-gesture) × 3-period (pre-G, G, post-G) ANOVA was separately conducted for L1 and L2. We obtained a significant interaction between the groups and the periods in both the left inferior frontal gyrus (IFG) and the left inferior parietal lobule (IPL) in L2. The activation of the gesture group significantly increased through the three periods in the left IFG, but decreased marginally in the left IPL. In contrast, in L1, we obtained no significant interaction in the left IFG, and a significant interaction in the left IPL, in which the activation of the no-gesture group increased through the periods.

Conclusion: Taken together, the cortical activation in the left IFG was observed in the gesture group when they narrated in L2, and the cortical activation in the left IPL was observed in the no-gesture group when they narrated in L1.

The present results may suggest that gesture production plays an important role in L2 to activate the left IFG that contributes to integrate information from gesture and speech.

The asymmetric function of gesture production in the left IFG and the left IPL will be examined in a future experiment.

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About the interpretation of representational gestures

The lack of meaning conventions for co-speech gestures makes them highly ambiguous. For instance, a circular hand movement may refer to a concrete object like a ball, or an abstract concept like the universe. It is well-known that speech influences the interpretation of these ambiguous co-speech gestures, but here we argue that the general abstractness level of preceding speech has a subtle effect on their interpretation as well. In particular, we show that processing abstract or concrete language will influence the way these gestures are interpreted.

Multiple studies have shown that activating concepts in a linguistic priming task has a powerful effect afterwards on cognitive processes like emotion, behavior and perception ([2]). Recently, Krahmer & Stapel ([3]) have shown that the overall abstractness level of words can already be sufficient to influence basic cognitive processes like the perception and interpretation of information. Although their series of experiments considered the influence of abstract and concrete priming on other types of perceptual tasks, we believe that similar priming effects can take place across conversational modalities such that priming words may influence the interpretation of representational gestures as well. We aimed to test this in the current study.

To investigate this, forty-eight participants were randomly assigned to one of two experimental conditions, the abstract or the concrete priming condition. Participants had to memorize ten words and were told that they had to recall these words later on in the experiment. Dependent on the condition, this list consisted of ten concrete (e.g. 'dishwasher', 'office chair') or ten abstract nouns (e.g. 'democracy' and 'hypothesis'). Next, participants were shown eight film fragments showing representational gestures and interpreted these by means of an open question (i.e. 'what do you think this person was telling during the making of the particular gesture?'). The film fragments showed only chest, in order to avoid distraction and cues from face (see figure 1).



Figure 1. Two examples of experimental video clips.

For the analyses, the given interpretations were annotated as 'concrete', 'abstract' or 'other' with the use of strict annotation guidelines. To control for objectivity of annotations, a random sample of the interpretations was annotated by three annotators independently, who reached a substantial overall agreement (κ : .73, $p < .001$). Annotations for 'other' were equally frequent in both conditions and were therefore ignored for the current analyses. Results for 'concrete' and 'abstract' interpretations among the conditions are shown in figure 2.

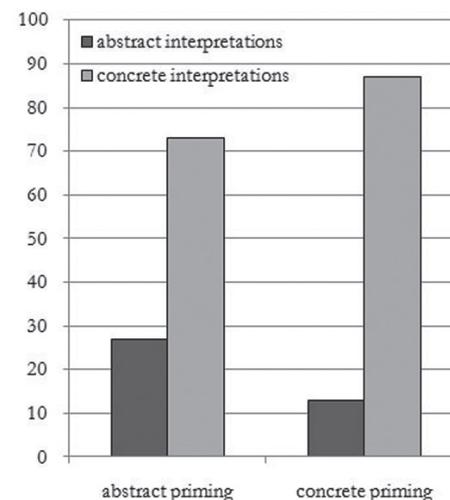


Figure 2. Percentage of concrete and abstract interpretations among the conditions.

As predicted, priming influenced the way in which participants interpreted the gestures. Despite a concrete bias, participants who were primed with concrete words were more likely to assign a concrete interpretation to the gestures ($M=7.00$, $SD=1.50$), while abstract primed participants interpreted more gestures with an abstract meaning ($M=5.93$, $SD=1.89$), $F(1, 46)=4.84$, $p < .05$, $\eta^2 = .095$. This result suggests that preceding linguistic context subtly primes the interpretation of co-speech gestures.

References

- McNeill, D. (1992). *Hand and mind. What gestures reveal about thought*. Chicago: University of Chicago Press.
- Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253–285). New York: Cambridge University Press.
- Krahmer, E., & Stapel, D. (2009). Abstract language, global perception: How language shapes what we see. *Proceedings of the 31th Annual Conference of the Cognitive Science Society*.

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Sociolinguistic variation in the 1 handshape in British Sign Language: Pointing versus non-pointing signs

In this paper, we report the results from the first sociolinguistic study being undertaken as part of the British Sign Language Corpus Project, a three-year project (2008-2010) that will create a machine-readable digital video corpus of British Sign Language (BSL) collected from 240 Deaf signers in 8 cities across the United Kingdom. Our study examines variation in BSL signs produced with the 1 handshape (i.e., with a hand configuration involving the index finger extended from a fist, with the thumb and other fingers closed). Signs in this class exhibit variation with, for example, the thumb and/or pinky finger sometimes being extended in addition to the index finger. They also exhibit orientation variation with the hand variously oriented with the palm downwards or sideways, with some researchers suggesting that orientation may be linked to grammatical function (e.g., Pfau, in press). Preliminary results from 1220 tokens of 1 handshape signs, collected from 122 deaf signers in 4 cities (Glasgow, Birmingham, Manchester and Bristol), indicate that variation in the 1 handshape is conditioned by both linguistic and social factors, as also found for American Sign Language (ASL, see Lucas, Bayley & Valli, 2001). Variants with thumb extension account for almost two-thirds of all the non-citation forms in our data, while variants with pinky extension or index finger bending are relatively few in number. Significant factors conditioning 1 handshape variation include the degree of indexicality shown by the sign, with pointing signs (e.g., PRO-1) showing significantly more variation than non-pointing signs (e.g., THINK). This effect could be one of the main reasons grammatical category was also significant, with function signs (and pronominal signs in particular) showing significantly more variation than content signs. The phonological environment is also important, with our data showing evidence of both progressive and regressive assimilation. Lastly, gender is a significant social factor, with female signers producing significantly fewer tokens with handshape variation than male signers. Other social factors such as a signer's region of origin, age, language background (having deaf versus hearing parents), and BSL teaching experience were not significant. We discuss our findings in relation to previous work on phonological variation in American, Australian and New Zealand sign languages (Schembri et al., 2009). We will explore the results with regard to the relative importance of grammatical category versus lexical frequency effects, the importance of indexicality as well as the role of the surrounding phonological environment (Bayley & Lucas, 2005). In particular, we will focus on the possible reasons that pointing signs appear to show quantitatively different phonological behaviour than non-pointing signs in both BSL and other sign languages, and discuss how this supports models of sign language lexicons that suggest a subset of signs exhibit varying degrees of fusion with gesture (e.g., Johnston & Schembri, 2007).

References

- Bayley, R. & Lucas, C. (2005). Variation in ASL: The role of grammatical function. *Sign Language Studies* 6(1).
 Johnston, T. & Schembri, A. (2007). *Australian Sign Language: An introduction to sign language linguistics*. Cambridge: Cambridge University Press.
 Lucas, C., Bayley, R. & Valli, C. (2001). *Sociolinguistic Variation in American Sign Language*. Washington, DC: Gallaudet University Press.
 Pfau, R. (in press). A point well taken: On the typology and diachrony of pointing. To appear in: Napoli, D.J. & G. Mathur (eds.), *Deaf around the world*. Oxford: Oxford University Press.
 Schembri, A., McKee, D., McKee, R., Johnston, T., Goswell, D. & Pivac, S. (2009). Phonological variation and change in Australian and New Zealand Sign Languages: The location variable. *Language Variation and Change* 21(2).

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Audiovisual orchestrations of metaphoric gestures in a TV report

Although metaphoric gestures in TV reports have already been the subject of gesture studies (e.g. Cienki 2004), so far, they have not been systematically analyzed either with regard to their form-based meaning construction or in the context of their audiovisual orchestration. Furthermore, metaphoric gestures have not yet received any systematic attention in either television or film studies. This deficit serves as the starting point of the present talk. We aim to fill these gaps by presenting a linguistic form-based approach to gesture analysis (Müller 2007) and a form-based approach to film analysis with regard to cinematic expressivity (Kappelhoff 2004, 2008). We will give a short presentation of a linguistic analysis of the verbo-gestural metaphoric expressions used in a TV report and then focus on the aesthetics of the audiovisual image in which they are embedded.

With a microanalysis of a report on the current financial crisis broadcasted in the German political TV program "Report Mainz", we will illustrate that focusing on metaphoricality in audiovisual images draws attention to the intertwining of metaphoric gestures and film techniques. For example, in the report a close-up shot of the performing hand makes the movement of the gesture become more visible. In comparison to metaphoric gestures that occur in everyday-life, film techniques like camera movement, framing and editing construct a cinematic perceptive space in which metaphoric gestures only appear within the respective audiovisual staging. We will show how verbo-gestural metaphoric expressions are integrated in a dynamic and temporarily organized aesthetic audiovisual structure. Our analysis of this integration reveals that the metaphoricality of verbo-gestural expressions correlates with specific compositional features of the expressive qualities of the audiovisual image. On the basis of these findings we further investigate how the audiovisual image highlights certain expressive qualities of the metaphoric gestures performed. Since our subject matter concerns verbo-gestural metaphoric expressions on television, a film-analytical perspective on cinematic expressivity (Bellour 2005, Deleuze 1986, Kappelhoff 2004) and, more specifically, on expressional movement (Kappelhoff 2004, Kappelhoff et al. subm.) is required.

This interdisciplinary approach is productive for both perspectives: Linguistic form-based gesture analysis can offer a vocabulary for describing gestural phenomena as well as a differentiated perspective on gestures with regard to the issues of multimodality and Metaphor Foregrounding Analysis (Müller & Tag subm.), all of which are relevant to film studies. Approaches to cinematic expressivity in film studies (Kappelhoff 2004) can offer a contribution to determining the meaning construction of multimodal metaphors in media contexts which, in turn, is of relevance to gesture studies.

References

- Bellour, R. (2005). Das Entfalten der Emotionen. In: M. Brütsch, V. Hediger, U. von Keitz & M. Tröhler (Eds.) *Kinogefühle. Emotionalität und Film*. Marburg: Schüren, pp. 51–102.
 Cienki, A. (2004). Bush's and Gore's language and gestures in the 2000 US presidential debates: A test case for two models of metaphors. *Journal of Language and Politics* 3:3, pp. 409–440.
 Deleuze, G. (1986). *Cinema I: The Movement-Image*. Minnesota: University of Minnesota Press.
 Müller, C. (2007). MGA – Methods of Gesture Analysis. Unpublished Manual.
 Müller, C. & Tag, S. (subm.). Attention, Foregrounding, and Embodied Activation. Multimodal Metaphors in Spoken Discourse. In: *Cognitive Semiotics*.
 Kappelhoff, H. (2004). *Matrix der Gefühle. Das Kino, das Melodrama und das Theater der Empfindsamkeit*. Berlin: Vorwerk 8.
 Kappelhoff, H. (2008). Die Anschaulichkeit des Sozialen und die Utopie Film. Eisensteins Theorie des Bewegungsbildes. In: G. Boehm, B. Mersmann & C. Spies (Eds.), *Movens Bild. Zwischen Evidenz und Affekt*.

München: Wilhelm Fink Verlag, pp. 301–324.

Kappelhoff, H. et al. (subm.). Das Projekt *eMAEX* – Ansätze und Potentiale einer systematisierten Methode zur Untersuchung filmischer Ausdrucksqualitäten, in: *montage/av*.

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Body postures as signs

In communication science and semiotics, gesture has been studied extensively as a sign system, as have intentional body movements. Body postures, on the other hand, have received very little attention, apart from their function as vehicle of emotion that has been studied in behavioral psychology (Bull 1987, Wallbott 1998). In my Ph.D. thesis, body postures will be investigated from a semiotic perspective. Though body postures have sometimes been described as signs, they have never been taken seriously as a sign system with syntactic, pragmatic and semantic dimension.

Body positions with any kind of meaning can be called “body postures”; for body postures with conventional meaning, the term “emblematic posture” is proposed. The syntactic analysis of the sign system “body posture” studies anatomical configurations and their combinations. Basic categories of anatomic position-taking such as sitting, standing or lying (Hewes 1957) can be distinguished by body orientation, joint configurations and position of head, trunk, upper and lower extremities. Further factors have to be considered, e.g. body tension, extension in space, characteristics of artefacts used, position-taking vs. static position (cf. *to straighten up* vs. *upright position*).

The semantic analysis of body posture relies on empirical work to determine and delimitate the meaning of body postures. This will be done in an in-depth analysis for one basic category (e.g. sitting). In a first step, pictures of different anatomical sitting positions will be shown to subjects asking to relate them to meanings. If the varieties shown are sufficiently fine-grained, the limits between variants of the same meaning and different meanings should become visible, and a basic repertoire of postures can be described. A special focus of the investigation will lie on emblematic postures (Zachar’in 2000). At the moment, a pilot study is done to test the study design.

The distinction between conventional core meanings and situation-dependent components (cf. Poggi 2007) has to be taken into account and clarified. Another interesting question arises in regard to the relation between the expression plane, which is anatomically determined, and the content plane: Is meaning as found in body postures just reflecting the possibilities of our anatomy, or is it to a certain degree independent? The answer to this question might throw some light on the possibilities and limits of the concept ‘embodiment’ as discussed in cognitive science.

In a last step, language material can be taken into account: Idioms and terms like ‘to sit sth. out’ or German ‘grangebeugt’ might throw light on processes of meaning production, as for example symbolization and metaphorization. Body postures lie on the frontier between biologically determined mechanisms (e.g. aggressive postures) and cultural meaning construction (e.g. penitence positions) conventionalized in genres and traditions (e.g. tableaux vivants).

References

Bull, Peter E. (1987): *Posture and gesture*, Oxford.

Hewes, Gordon (1957): The anthropology of posture, in: *Scientific American* 196, 123–132.

Poggi, Isabella (2007): *Mind, Hands, Face and Body. A Goal and Belief View of Multimodal Communication*, Berlin: Weidler.

Wallbott, Harald G. (1998): Bodily expression of emotion, *European Journal of Social Psychology* 28, 879–896.

Zachar’in, Dimitri (2000): Symbolische Körperhaltungen, in: M. Egidi et al. (Eds.) *Gestik: Figuren des Körpers in Text und Bild*, Tübingen, 87–102.

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Joint attention and shifting spatial reference points in ASL

American Sign Language (ASL) users take full advantage of their surrounding space to localize conceptual entities they wish to reference in their discourse. Most investigations have focused on relative spatial relationships among these reference points (e.g., Liddell 1990, 2003; Winston 1995). In the present study we investigate cognitive aspects of how the signer uses spatial reference points in more complex ways having to do with the inter-relation of conceptualized proximity, construal, and how the signer chooses to focus joint attention.

That signers direct attention to spatial reference points has been made clear, but it also appears that attention is directed dynamically to various reference points so as to profile primary and secondary entities or ideas with the effect that some such references are clearly subordinate to others. Thus the signer may maintain primary attention on one element while also directing attention to other more subordinate, or dependent, elements to a lesser degree, or may subordinate a previously focused element by shift primary attention to a new element while retaining some attention, however secondary, to the original element in some space. Critical to this dynamicity is how the signer incorporates his or her own body in directing attention. These elements are evident, for example, in differentiating passives from actives where reference to an agent is backgrounded but often present (Janzen and Shaffer 2007), in certain simultaneous constructions (Janzen 2008; see also Vermeerbergen, Leeson and Crasborn 2007), and in creating constructed spaces which anchor reported speech evidentials to a non-present third person, both in time and in distance (Shaffer 2007), through pointing, focusing eye gaze alternately to locations in space and to the addressee, and the use of body partitioning (Dudis 2004).

Lastly, we explore how attention is jointly focused, and what this might tell us about how signers conceptualize the relation between articulation space and complex mental spaces. Thus we conclude that joint attention in signed discourse involves complex cognitive tasks in that attention is distributed as signers use and layer multiple spaces that lend cohesion to their discourse texts.

References

- Dudis, Paul G. 2004. Body partitioning and real-space blends. *Cognitive Linguistics* 15(2), 223–238.
- Janzen, Terry. 2008. Perspective shifts in ASL narratives: The problem of clause structure. In Andrea Tyler, Yiyoung Kim, and Mari Takada (Eds.), *Language in the Context of Use: Usage-Based Approaches to Language and Language Learning*. Berlin/New York: Mouton de Gruyter. 129–154.
- Janzen, Terry, and Barbara Shaffer. 2007. The Agentive Presence in ASL Passive Constructions, Paper presented at the 2nd international AFLiCo conference: Typology, Gesture, and Sign, Université Lille 3, May 10 – 12, 2007, Lille, France.
- Liddell, Scott K. 1990. Four functions of a locus: Re-examining the structure of space in ASL. In Ceil Lucas (Ed.), *Sign Language Research: Theoretical Issues*. Washington, DC: Gallaudet University Press. 176–198.
- Liddell, Scott K. 2003. *Grammar, Gesture, and Meaning in American Sign Language*. Cambridge: Cambridge University Press.
- Shaffer, Barbara. 2007. A Discourse analysis of evidentials in American Sign Language. Paper presented at the 10th ICLC conference, AGH University of Science and Technology, Krakow, Poland, July 15 – 20, 2007.
- Winston, Elizabeth A. 1995. Spatial mapping in comparative discourse frames. In Karen Emmorey and Judy S. Reilly (Eds.), *Language, Gesture, and Space*. Hillsdale NJ: Lawrence Erlbaum. 87–114.
- Vermeerbergen, Myriam, Lorraine Leeson, and Onno Crasborn, (Eds). 2007. *Simultaneity in Signed Languages: Form and Function*. Amsterdam and Philadelphia: John Benjamins.

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Handedness discrepancies in deaf signers with stroke: Looking at signing, fingerspelling and gesturing skills in British Sign Language (BSL)

Handedness is not a structural property of the hands but rather a property of the brain itself. There is a strong link between handedness and cerebral lateralisation. Sign languages provide an unusual vehicle for exploring the link between handedness and hemispheric specialisation for language, since in sign language the hands themselves are the articulators.

This research looks at discrepancies in handedness and cerebral lateralisation for three main communication abilities of deaf signers and signer aphasics in British Sign Language (BSL)—fingerspelling, signing, and gesturing. Since the left and right hemispheres each control movements of the contralateral hand, study of the linguistic use of the two hands in sign language, fingerpelling and gesturing in deaf signers may provide a more direct evaluation of the language capacities and interactions for language processing of the two cerebral hemispheres.

Fingerspelling is a manual representation of written language, used by signers to fill lexical gaps in a sign language. It entails rapid sequential motor actions to a greater extent than sign. Sign Languages are linguistic systems as opposed to Gestures which are non-linguistic. Signs and gestures are represented differentially in the brain. It was essential to ask signers to gesture and not sign in the gesture task, since it often resulted in an overlap between these two skills. These skills impose different motoric as well communicative and linguistic demands. Do these constraints influence handedness and cerebral lateralisation in deaf people? Do linguistic features of sign language influence handedness patterns? This study aims to explore some of these questions.

The study focuses on the use the dominant and non-dominant hand, for these three skills. The study was carried out under three different task conditions: (a) use of Dominant hand vs Non-Dominant Hand (b) use of just one hand (c) “impeded” hand condition which involved participants to wear a hand splint and perform the tasks.

The experiments in this study look at handedness patterns and any asymmetries produced during the production of signs, fingerspelling and gestures by deaf signers of BSL. The experiments were designed to explore patterns of handedness and what coping strategies are employed by signers when faced with a motor constraint. This was then compared with data from deaf signers who have suffered stroke.

Preliminary observations from this study has found a few coping and compensatory strategies that are employed by deaf signers who have suffered stroke. Some more strategies are observed in normal unimpaired signers when they are faced with a degree of motor constraints. This also looks at dissociation in breakdown between signing and gesturing in deaf aphasics.

The study of hand asymmetries in deaf signers and deaf aphasics offers a unique perspective on the relationship between handedness and language functioning and provide insights about the relationship between handedness and language organisation in the brain.

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When the hands say it all: Comprehension of contemporary American emblems

In 1975, Johnson, Ekman and Friesen examined emblem comprehension in Caucasian, middle-class, men in the United States and identified a corpus of emblems that were universally understood. Purpose: The current study builds upon these data and extends our knowledge of emblem comprehension in the United States. In Study 1, we extend Johnson and colleagues' findings by characterizing emblem comprehension in a contemporary sample of adults with varied ethnic/racial backgrounds. Study 2 examines emblem comprehension in children and adolescents to determine whether there are developmental differences in comprehension for participants within the same culture but of different generations. Study 3 explores the impact of facial expressions on emblem understanding, by comparing emblem decoding when gestures are accompanied by facial expressions versus no face. Participants: Participants in Study 1 were 64 university undergraduates (18- to 22-years old). Study 2 participants were 19 children/adolescents (10- to 17-years old). Study 3 participants were 20 undergraduates (18- to 21-years old). All were native English speakers, living in the United States since at least age 2, with no knowledge of American Sign Language. Procedure: In Studies 1 and 2, participants viewed a video of a model performing 151 American emblems derived from a variety of sources including Johnson and colleagues (1975), Morris (1994), Wagner and Armstrong (2003), and naturalistic observations. For each emblem, participants then described the gesture's meaning, how sure they were of their response (using a 5-point Likert scale), and whether they recalled having seen the gesture before. In Study 3, the same emblems were shown to each participant in two conditions: one with the model's face visible and one with the model's face occluded. Results: In all studies, we calculated the percentage of participants who translated each emblem using the established verbatim meaning (derived from prior studies and emblem production tasks). This approach was consistent with Johnson and colleagues' methodology. Three types of emblems were derived from our data: Verified emblems (70%-100% verbatim response, 70%-100% seen before), Probable emblems (70%-100% verbatim response, 50%-69% seen before), and Ambiguous emblems (50-69% verbatim response, 50%-69% seen before). Study 1 yielded 20 Verified (e.g., A-OK, I don't know), 0 Probable, and 17 Ambiguous emblems (e.g., surprised, call me). Study 2 yielded 21 Verified (e.g., loser, peace), 2 Probable (e.g., talks too much, choking), and 12 Ambiguous emblems (e.g., whatever, raise the roof). In Study 3, preliminary data from our first 6 participants was analyzed via a one-way ANOVA with condition (face visible, face occluded) as the within subjects variable. This yielded a trend towards significance, with a higher percentage of participants providing verbatim responses for emblems when the face was present compared to when it was occluded. Discussion: Alternative scoring systems for emblem comprehension will be explored, and interpretations of findings will be discussed in relation to how emblem understanding likely shapes everyday social behavior. Clinical applications of findings will also be addressed.

References

- Johnson, H. G., Ekman, P., & Friesen, W. V. (1975). Communicative body movements: American Emblems. *Semiotica*, 15, 335–353.
- Morris, D. (1994). *Bodytalk: The Meaning of Human Gestures*. New York: Crowned Publishers, Inc.
- Wagner, M. & Armstrong, N. (2003). *Field Guide to Gestures: How to Identify and Interpret Virtually Every Gesture Known to Man*. Singapore: Quirk Productions, Inc.

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“What is this?” Gesture as a potential cue to identify referents in discourse

Young children learning null-argument and subject-prominent languages have shown sensitivity to discourse-pragmatic features in their speech and gestures. Then how do they develop sensitivity to discourse-pragmatic principles? One possibility is they learn the principles from their caregivers. Only a few studies have addressed this issue (Paradis & Navarro, 2003; Guerriero, Oshima-Takane, and Kuriyama, 2006). And their findings have not yet reached consensus of whether caregivers display sensitivity to discourse-pragmatic principles in their speech and gestures when interacting with their children.

Given the contradictory findings, the first aim of this study was to add to the existing literature and ask whether caregivers follow discourse-pragmatic principles during interactions with their children. The second aim was to investigate whether the children are responsive to their caregivers' pragmatic behaviors. To address these two questions, we videotaped ten Chinese-speaking caregivers in China and eight American-speaking caregivers in America who were spontaneously interacting with their children. We examined the caregivers' sensitivity to the information status of referents (i.e., given vs. new) in gestures and their children's responsiveness to the gestures.

We specifically looked at the utterances in which the caregivers asked their children to label a particular referent among all objects, e.g., “What is this?” (“Zhe4ge shi4 shen2me le?”). A referent was considered to be given if both caregiver and child were engaged in a conversation on this referent in the preceding 20 utterances. Otherwise, it was considered as a new referent. Both groups of caregivers tended to use pronouns or demonstrative pronouns rather than nouns when asking their children to identify both given and new referents. We also examined the gestures (iconic gestures, deictic gestures) that co-occurred with the caregivers' questions. The Chinese caregivers gestured more than American caregivers. Yet both groups of the caregivers produced gestures more often when asking about new referents than when asking about given referents, thus following the discourse-pragmatic principle of information status. Repeated measures ANOVA found a significant effect of information status, $F(1,16)=18.81$, $p=.001$, a significant effect of language, $F(1,16)=12.05$, $p=.04$, and no interaction, $F(1,16)=.02$, $p=ns$. (Figure 1).

Finally, we explored whether the children identified the referents their caregivers were asking about. We looked at the proportion of time the children could identify new and given referents with and without gestures. We found a significant effect of information status of referents, $F(1,16)=10.65$, $p=.005$, a significant effect of gesture, $F(1,16)=67.59$, $p<.001$, insignificant effect of language, $F(1,16)=.71$, $p=ns$, and significant interaction between information status of referents and gesture, $F(1,16)=15.85$, $p=.001$ (Figure 2). Both groups of the children identified given referents more often than new referents. Yet they were more able to identify the new referents that were accompanied by gestures than the new referents that were not, Chinese: $t(9)=4.57$, $p=.001$; American: $t(7)=4.56$, $p=.003$. Putting new and given referents together, both groups of the children were equally able to identify new referents that were accompanied by gestures and all given referents. Thus, gesture serves as a potential cue for the children to identify referents according to discourse-pragmatic principle.

Figure 1. The proportion of referential expressions indicating given referents (left) and new referents (right) accompanied by gestures produced by the Chinese caregivers (black bars) and the American caregivers (white bars)

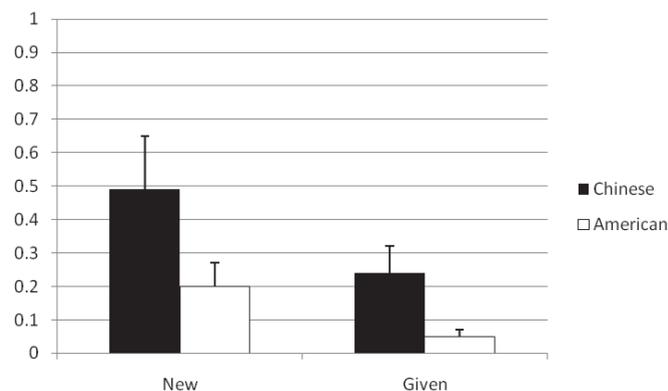
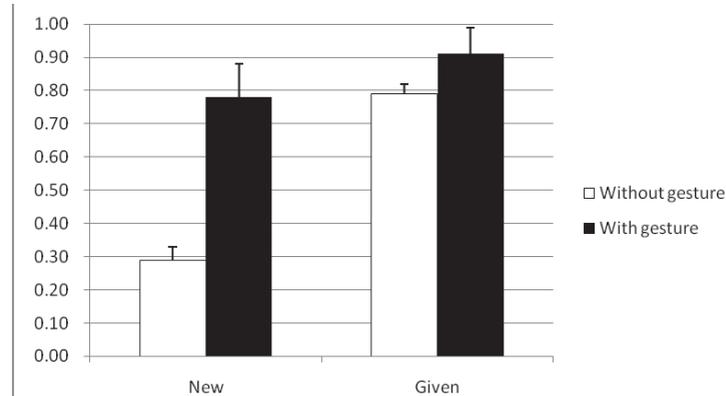


Figure 2. The proportion of times that the Chinese children (top) and American children (bottom) identified new referents (left) and given referents (right) when they were accompanied by gestures (black bars) and when they were not accompanied by gestures (white bars)

Chinese children



American children

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Semantic coordination between speech and gesture: Insights into mental representation of discourse entities in bilinguals

To produce a comprehensible and cohesive narrative, a speaker has to carefully track the references. Besides nouns and pronouns, adults use gestures to track references. In So, Kita, & Goldin-Meadow (2009)'s study, the speakers used image-driven gestures (iconic and abstract deictic gestures) in addition to speech to indicate references. Specifically, they used gestures to identify references when the references are also specified in speech. Lexical specificity in speech thus appears to go hand-in-hand with referential identification in gesture. However, do bilingual speakers who are imbalanced in language dominance use gestures to identify references that are not specified in speech? And do concrete deictic gestures coordinate with speech differently from image-driven gestures?

The present study addressed these issues by exploring the circumstances under which the imbalanced bilinguals use concrete deictic and image-driven gestures to identify references. We look at fifty bilinguals who have learnt English and Mandarin-Chinese in early childhood but are imbalanced in language dominance of both languages. We identified their language dominance by administering a self-report questionnaire developed by Lim, Liow, Chan, & Onslow. (2008) and calculated the difference scores (total rating score in English-total rating score in Chinese). We assigned the ten participants who got the lowest difference score to the Chinese-dominant group and another ten participants who got the highest difference score to the English-dominant group. We manipulated lexical specificity in referential expressions in speech by asking the bilinguals to describe two stories, the Man-Woman (M-W) story involving protagonists of different genders, and the Man-Man (M-M) story involving protagonists of the same gender.

All references were specified in the M-W story but not in the M-M story. Thus, our analyses focused on referential identification in the M-M story. The English- and Chinese-dominant speakers used gestures in different ways. Regarding concrete deictic gestures (Figure 1), repeated measures ANOVA showed a significant effect of references, $F(1,18)=16.99$, $p=.001$, a significant effect of language dominance, $F(1,18)=8.30$, $p=.01$, and a significant interaction, $F(1,18)=9.98$, $p=.005$. The English-dominant speakers were more likely to use concrete deictic gestures when the references were not specified than when the references were specified, $t(9)=5.47$, $p<.001$. However, the Chinese-dominant speakers used concrete deictic gestures irrespective of whether the references were specified, $t(9)=.65$, $p=ns$. Regarding image-driven gestures (Figure 2), there was a significant effect of references, $F(1,18)=26.72$, $p<.001$, a significant effect of language dominance, $F(1,18)=10.15$, $p<.001$, and a significant interaction, $F(1,18)=26.06$, $p<.001$. The English-dominant speakers were more likely to use image-driven gestures when the references were specified than when the references were not specified, $t(9)=7.57$, $p<.001$. However, the Chinese-dominant speakers did not display this pattern, $t(9)=.43$, $p=ns$.

Our findings suggested that both image-driven gestures and concrete deictic gestures were tightly integrated with the discourse representation of the accompanying speech in the English-dominant speakers but not in the Chinese-dominant speakers. Since gestures reflect the way speakers organize their thinking, the way the Chinese-dominant speakers gestured probably suggests that they failed to distinguish the references that were uniquely specified from those that were not in their underlying mental representation of discourse.

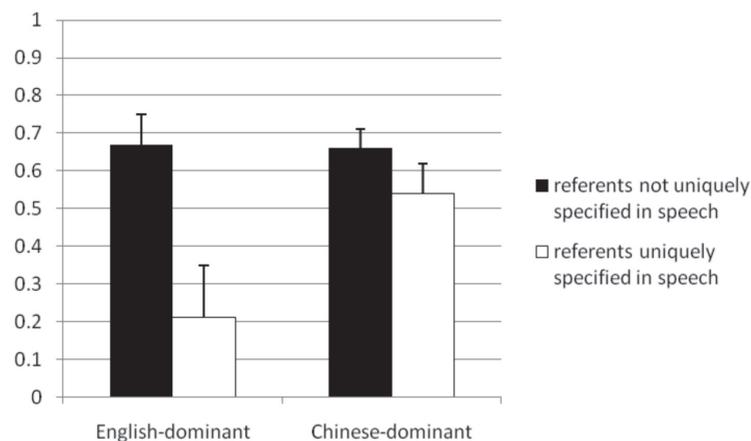


Figure 1. Proportion of references accompanied by concrete deictic gestures in the English- and Chinese-dominant speakers. The black bars represent references not uniquely specified in speech; the white bars represent references uniquely specified in speech. The references produced by the English-dominant speakers are displayed in the left panel; the Chinese-dominant speakers in the right panel.

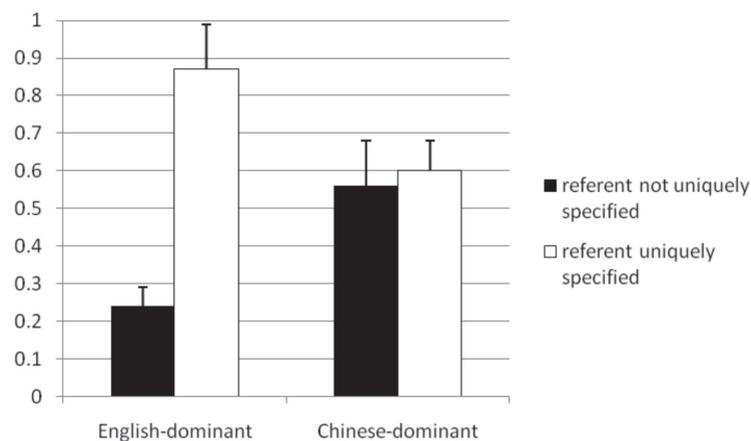


Figure 2. Proportion of references accompanied by image-driven gestures in the English- and Chinese-dominant speakers. The black bars represent references not uniquely specified in speech; the white bars represent references uniquely specified in speech. The references produced by the English-dominant speakers are displayed in the left panel; the Chinese-dominant speakers in the right panel.

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L1 thinking for speaking before age 3

Slobin (1991) has proposed that in first language (L1) acquisition, children learn a particular pattern of thinking for speaking. Based on where the language encodes path, Talmy (1985, 2000) has classified languages into two categories: verb-framed and satellite-framed languages. Verb-framed languages encode directionality on the verb, while satellite-framed languages encode directionality on a satellite (an adverb particle). Cross-linguistic research on motion events has demonstrated that speakers of typologically different languages have different patterns of thinking for speaking about motion and spatial relations (for studies, see Stam, in press).

English is an example of a satellite-framed language. Motion and manner are indicated by the verb, and path is indicated by a satellite. English speakers tend to describe processes and to accumulate path components in speech (Slobin, 1996; Berman and Slobin, 1994), and they tend to produce path gestures with a satellite component, either alone or as part of a larger construction, and to accumulate path gestures in a single clause (McNeill & Duncan, 2000; Stam, 2006).

Berman and Slobin (1994) have pointed out that L1 English children use manner verbs as young as three years old and consistently use particles and prepositions. They claim that “particle and prepositional elements are highly salient and readily accessible to English-speaking children from early on in their development of language structure and language use” (Berman and Slobin, 1994, 161).

McNeill (1992, 2005) has shown that by the age of two, children produce iconic gestures. He has proposed that the expression of cross-linguistic differences in thinking for speaking in speech and gesture is related to children’s development of a language-imagery dialectic around the age of three.

Little is known about the longitudinal development of L1 thinking for speaking both linguistically and gesturally in English. In this paper, the presenter will report on the first year of a longitudinal study that examines how thinking for speaking develops both linguistically and gesturally for an English-speaking child, age 2:4 to 3 years old. She will discuss whether English thinking for speaking patterns are in place before the age of three.

References

- Berman, R. A. and Slobin, D. I. (1994). *Relating Events in Narrative: A Crosslinguistic Developmental Study*. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.
- McNeill, D. (1992). *Hand and mind*. Chicago: The University of Chicago Press.
- McNeill, D. (2005). *Gesture and thought*. Chicago: The University of Chicago Press.
- McNeill D. and Duncan S. (2000). Growth points in thinking-for-speaking. In D. McNeill (Ed.), *Language and gesture*, 141–161. Cambridge, GB: Cambridge University Press.
- Slobin, D. I. (1991). Learning to think for speaking: Native language, cognition, and rhetorical style. *Pragmatics*, 1, 7–26.
- Slobin, D. I. (1996). From “thought and language” to “thinking for speaking.” In J. J. Gumperz and S. C. Levinson (eds.), *Rethinking linguistic relativity*, 70–96. Cambridge, GB: Cambridge University Press.
- Stam, G. (2006). Changes in patterns of thinking with second language acquisition. Unpublished Ph.D. Dissertation. Committee on Cognition and Communication. Department of Psychology. The University of Chicago.
- Stam, G. (in press). Can a L2 speaker’s patterns of thinking for speaking change? In Z. Han, and T. Cadierno (Eds.), *Linguistic relativity in L2 acquisition: Evidence of L1 thinking for speaking*. Clevedon: Multilingual Matters.
- Talmy, L. (1985). Lexicalization patterns: Semantic structure in lexical forms. In Shopen, T. (ed.), *Language typology and syntactic description: Vol. 3. Grammatical categories and the lexicon*, 57–149. Cambridge: Cambridge University Press.
- Talmy, L. (2000). *Towards a cognitive semantics. Volume II: Typology and process in concept structuring*. Cambridge, MA: The MIT Press.

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Metaphors in the modals: ASL modals and mental spaces

Modal verbs – such as *need*, *should*, and *must* – are traditionally discussed in terms of strength. We implicitly perceive modals as carrying different degrees of strength as grounded in their degree of obligation: strong modals are strongly obligatory, whereas weak modals are mere suggestions. Here it is shown that this concept of strength has a deeper grounding in primary embodied metaphor (Lakoff and Johnson 1999) as informed by mental spaces theory (Fauconnier and Turner 2002). Drawing on Liddell's (1995) demonstration of signing space in ASL as a conceptually blended mental space, Taub's (2001) work on the primary metaphoric iconicity of signs, and Wilcox and Shaffer's (2006) work on ASL modals, this paper demonstrates that ASL modals iconically reflect the semantics of their relative degrees of obligation. One key feature of these signs is that many such verbs share phonemes like handshape and movement; the differences occur in the strength of the modal, which translates to differences in the degree of emphasis in of the sign's motion phoneme. What is normally considered to be an aspect of sign language prosody – force of movement – is shown to reflect the constructional semantics of the verb.

For example, obligatory SHOULD and MUST have the same handshape, location, and palm orientation. They differ in that MUST is accompanied by (a) a facial expression of a furrowed brow and head nod and (b) a decisive, harsh single motion downward; SHOULD has (a) a more neutral face and (b) two slight up-and-down motions. Therefore MUST, the stronger modal, has a more forceful sign than its weaker counterpart SHOULD. OUGHT-TO is simply a weaker version of SHOULD, with a more neutral, even positive, face.

Each set of modals is decomposed into its underlying primary metaphors, resulting in the conclusion they convey the kind of causality grounded in the metaphor Causes are Forces. Thus, it is argued that modals “move” the agent into a mental space representing the hypothetical reality created by the modal. By moving in signing space, they move from one mental space to another as Liddell has argued. Furthermore, the intensity of the modal reflects the intensity of the causal force driving that movement. Strong modals like MUST forcefully push the agent into the mental space while weaker modals like SHOULD and OUGHT-TO do not have that same force behind them and only suggest movement. The force dynamics driving this mental causative action are visually realized through the amplitude of the motion's force. Hence, the implicit nature of modal strength is not an arbitrary conception, but rather a facet of semantics that reflects the deeper cognitive underpinnings of mental spaces.

References

- Dancygier, Barbara, and Eve Sweetser. 2005. *Mental spaces in grammar: conditional constructions*. Cambridge, New York: Cambridge University Press.
- Fauconnier, Gilles, and Mark Turner. 2002. *The way we think: conceptual blending and the mind's hidden complexities*. New York: Basic Books.
- Lakoff, George, and Mark Johnson. 1999. *Philosophy in the flesh: the embodied mind and its challenge to Western thought*. New York: Basic Books.
- Liddell, Scott K. 1995. Real, Surrogate, and Token Space: Grammatical Consequences in ASL. *Language, Gesture, and Space*, ed. by Karen Emmorey and Judy Reilly, 19–41. Hillsdale, New Jersey: Lawrence Erlbaum.
- Taub, Sarah F. 2001. *Language from the body: iconicity and metaphor in American Sign Language*. Cambridge, New York: Cambridge University Press.
- Wilcox, Sherman, and Barbara Shaffer. 2006. Modality in American Sign Language. *The expression of modality*, ed. by William Frawley, 207–237. Berlin; New York: Mouton de Gruyter.

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On pointing with the thumb

Based on a previously developed model of the perceptual, cognitive and interactive parameters that come into play when interlocutors point verbally (deixis) and visually to entities in the actual spatio-temporal surroundings (Stukenbrock in press), this paper elaborates upon a specific instance of manual gesturing: pointing with the thumb.

Although a growing body of research has been concerned with human pointing (Butterworth 2003; Goldin-Meadow 2003; Goodwin 2000, 2003; Kita 2003; Haviland 2000), formal as well as functional differences between various kinds of pointing gestures have mostly been neglected. Apart from very few exceptions (Kendon 2004; Kendon & Versante 2003), the focus has mainly been on index-finger pointing as the most prominent and species-specific form of human pointing. However, as Kendon & Versante (2003) have shown for ordinary face-to-face communication among Neapolitans, there is not only a wide range of different pointing gestures interlocutors may choose from, but also a close form-function link in the use of different pointing gestures. Taking the formal variability of manual pointing gestures as a starting point, this paper examines in detail how, when and why interactants point with the thumb. It is argued that there are context-specific perceptual, cognitive, interactive and epistemic affordances and restraints which guide the choice of the thumb gesture instead of, for instance, pointing with an extended index finger, with the little finger or with an open hand.

The data consist of video recordings from various settings (everyday conversation, cooking sessions, medical interaction, guided city tours). Drawing on the linguistic theory and methodology developed by interactional linguistics and linguistic anthropology, my approach is decidedly multimodal and works from the assumption that the use of visual resources such as gaze, gesture, body movement, the handling of objects, spatial arrangements etc. form an integral part of utterance construction in face-to-face interaction and need to be accounted for in linguistic analysis.

References

- Butterworth, George (2003). Pointing is the Royal Road to Language for Babies. In: Kita (ed.), 9–34.
- Goldin-Meadow, Susan (2003). *Hearing Gesture. How Our Hands Help Us Think*. Cambridge MA: The Belknap Press of Harvard University Press.
- Goodwin, Charles (2000). Pointing and the Collaborative Construction of Meaning in Aphasia. In: *Proceedings of the Seventh Annual Symposium About Language and Society. Austin (SALSA)*, Texas: University of Texas Press, 67–76.
- Goodwin, Charles (2003). Pointing as Situated Practice. In: Kita (ed.), 217–241.
- Haviland, John (2000). Pointing, gesture spaces, and mental maps. In: McNeill, David (ed.). *Language and gesture*. Cambridge: Cambridge University Press.
- Kendon, Adam (2004). *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Kendon, Adam (2008). Some reflections on the relationship between ‘gesture’ and ‘sign’. In: *Gesture* 8:3, 348–366.
- Kendon, Adam/Versante, Laura (2003). Pointing by Hand in ‘Neapolitan’. In: Kita (ed.), 109–137.
- Kita, Sotaro (ed.) (2003). *Pointing. Where language, culture and cognition meet*. Mahwah, N.J.: L. Erlbaum Associates.
- Stukenbrock, Anja (in press). Referenz durch Zeigen. Zur Theorie der Deixis. To appear in: *Deutsche Sprache*.

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Multimodality, indexicality and iconicity

Gesture and spoken language share dependence on contextual structure. Indexicality and viewpoint are equally deeply embedded in the meaningful nature of both “tracks” of multimodal communication, but manifest themselves differently because gesture is an embodied real-space blend in a different way from spoken language. Using data from recorded two-participant conversations about finding lodging in the San Francisco Bay Area, and videotapes of lectures, I examine these contrasts.

As Goodwin, Haviland and others have noted (cf. Kita 2003, McNeill 2000), humans readily interpret “deferred” points (points made “as if” the speaker were in some imagined location, and pointing from it), and points to loci representing abstract entities. Predictably, my data contains points to non-present locations and also to digits in telephone numbers, stages of imagined processes, etc. This is similar and not similar to the situation in spoken language. Speakers do “deferred” deixis with no trouble – they say, in Berkeley, Will you come visit me when I’m in Australia? But in monomodal speech, the label for the digit 5, or the stage of a process is not in itself located in a linguistic deixis system (except order of utterance relative to Now) relative to the speaker – added construal may be needed before someone can even label it this digit or that stage. Multimodality allows speakers to just say “5275...”, pointing to loci as they speak. Then they refer back to this 5 and that 5, disambiguating by re-pointing to the loci. Since gesture is necessarily enacted in a bodily field of indexical relations to Ego, these affordances are automatic.

Equally automatic, and equally different between the co-performed modalities, are the interleavings of iconic and indexical structure. English, for example, cannot in one word (cf. Slobin 1987, 2000) depict direction and manner of motion, and certainly not a referent’s location and her facial expression; gesture can co-articulate these things, thanks to the flexible multiple bodily articulators, automatically spatially superimposed on the bodily indexical field. My second case study will be the indexical partitioning of space – following on Özyurek (2000) and Sizemore and Sweetser (2008), I note that in my data there is a real difference between indexical and iconic uses in space “owned” by the speaker, space shared with the addressee, and “unclaimed” space. Specifically, the speaker/addressee line is limited (though accessible) in both indexical and iconic usage, though prolifically used for speech-interaction adjustment gestures. Different kinds of iconicity are also differently distributed with respect to space: miming a non-directional activity (dish-washing) is perfectly acceptable in the speaker’s immediately front-of-Ego space, but a directional gesture (throwing or moving) needs to stay off the S-H line; and iconic construction of peripheral topics tends to be spatially off center as well. Without gesture, discourse markers, intonation, and other structure would differentiate between peripheral vs. central-topic content, or content vs. speech act regulation. The abstract “indexical field” of the speaker or narrator needs more construction than indexical structures which can exploit the bodily indexical field directly.

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Meaning construction of language and gesture in Taiwan Sign Language

Under the pressure of informative and efficient constraints to narrate a coherent discourse, simultaneous constructions are prevalent in sign language discourse (Perniss 2007 a, b). These simultaneous constructions are constructed on-line through integrating both manual and non-manual signals to encode events from character’s or observer’s perspective (Liddell and Metzger 1998, Metzger 1995, Metzger and Bahan 2001, Pyers and Senghas 2007, among others). This study identified various simultaneous constructions in Frog Story narratives of Taiwan Sign Language (TSL) with reference to Talmy’s framework of conceptual analysis (2000). In particular, the non-linguistic gestures, co-sign gestures and non-manual signals will be examined in details.

Like co-speech gestures, most gestures and non-manual signals in sign language are context-based. Some provide the parallel meaning with the linguistic signals (examples (1) and (2)). Others provide the complementary meaning (example (4)). Still others provide different meanings from the linguistic signals (example (3) and (5)).

Based on Bahan and Supalla (1995), the function of eye-gaze at hands in examples (1) and (2) is to outline the precise shape of the object JAR and the precise path of the moving object DOG, respectively. Eye-gazing at the audience in example (3) represents the signer is the narrator describing the event that the boy’s being taken away is awful or unfortunate. In contrast, breaking the eye-gaze away from the audience represents the signer becomes the character involving in the event (example (4) and (5)). In example (5), the non-manual expressions indicate the suspect or guess of the character DOG about the event that the frog may be there.

How can we determine the meanings of these gestures and non-manual signals, especially when they encode meanings different from the manual signs? The example (6) includes at least six simultaneous constructions. They are constructed to express enriched actions (Fig. A), emotions (Fig. B, C), or attitudes (Fig. A) in addition to the meanings the manual signs provide. The facial expression of Fig. A has the meaning of ‘awful, unfortunate’ from the sign NOT.GOOD in Fig. C. The nonmanual signal of Fig. C represents the character’s feeling when he saw what happened, although there are no signs FEEL or THINK encoded.

The visual-gestural modality allows signers to integrate language, gesture, and non-manual signals simultaneously to represent the conceptualization of reality more iconically. How they are constructed on-line to get their meaning interpretation will be explained in terms of the blending theory (Fauconnier 1997, 1998, Fauconnier and Turner 1998, Liddell 2003).

(1) JAR



(2) WINDOW_{pro}+DOG_{pro}-fall

(3)

eye.gaze.front.and.tongue.protruding.out

BOY_{pro}.on.DEER_{pro}.and.DEER_{pro}.move(4) JAR_{pro}+DOG_{pro}-head.into

(5) _____ head.turn.left.and.nod++

TREE+point



(6)

CARELESS DOG WINDOW_{pro}+DOG_{pro}-fall.to.i (Fig. a) //

'(It is awful or unfortunate that) the dog fell from the window carelessly.'

MALE SEE.indicating.i.with.eye.gaze.to.i (Fig. b) //

'The boy saw what happened.'

NOT.GOOD.with.eye.gaze.to.i (Fig. c)

'(The boy thought) it is so bad!!'



Fig. A.



Fig. B.



Fig. C.

References

- Bahan, B. & S. Supalla. 1995. Line segmentation and narrative structure: A study of eyegaze behavior in American Sign Language. In K. Emmorey & J. Reilly (eds.)
- Fauconnier, G. 1997. *Mappings in Thought and Language*.
- Fauconnier, G. 1998. Mental paces, language modalities, and conceptual integration. In M. Tomasello (ed.),
- Fauconnier, G and M Turner. 1998. Conceptual integration networks. *Cognitive Science* 22(2), 133–187.
- Liddell, S. 2003. *Grammar, Gesture, and Meaning in American Sign Language*.
- Liddell, S. and M. Metzger. 1998. Gesture in sign language discourse. *Journal of Pragmatics* 30, 657–697.
- Metzger, M., 1995. Constructed dialogue and constructed action in American Sign Language. In Lucas, C. (Ed.)
- Metzger, M. and B. Bahan. 2001. *Discourse analysis*.
- Perniss, P. M. 2007a. Achieving spatial coherence in German Sign Language narratives. *Lingua* 117, 1315–1338.
- Perniss, P. 2007b. Locative functions of simultaneous perspective constructions in German Sign Language narratives. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.),
- Pyers, J. and A. Senghas. 2007. Reported action in Nicaraguan and American Sign Languages. In P. Perniss, R. Pfau & M. Steinbach (Eds.)
- Talmy, L. 2000. *Toward a Cognitive Semantics*.

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Comparing French native speakers' and second language learners' gestures

This paper is part of an ongoing research project that investigates the use of co-speech hand gestures in expository oral discourse. A first study conducted with a group of Australian learners of French as a second language showed that these speakers use mainly two types of gestures: presentational, to introduce ideas and information, typically with a 'palm up' hand, and representational, to offer a visual depiction of an entity, typically 'iconic' gestures (Tabensky 2008). A second study observed Australian learners of French, German and Greek giving oral presentations of similar format and found that they frequently use 'palm up' gesture not only to present and develop their topic but also, in a much lesser rate, to point to a member of the audience as a way of acknowledging this person's contribution (Tabensky, unpublished paper, IPrA World Congress 2009). The findings are in line with Kendon's thorough studies on this hand shape and its functions (Kendon 2004), but a comparison with native speakers' gestures performing a similar task would also increase our understanding of the learners performance and use of gestures. The purpose of the present study is precisely to conduct this comparison through the analysis of oral presentations given by French native speakers. The research questions are: 1. How do French native speakers use 'palm up' hand and other presentational gestures? 2. Does their gesturing differ in any way from the learners'?

The data were collected at the University of Paris 3, in 2009. Four post-graduate students, native speakers of French, were video-taped giving a prepared oral presentation during a seminar. They followed the same instructions previously given to the Australian second language learners. Ethics consents were obtained and individual debriefing sessions were also organized. Speech was transcribed using CA conventions, all gestures were coded and analyzed following mainly the methodology described in Kendon 2004.

Although results are rather disperse – there is no strong tendency – two main types of presentational gestures appear: bi-handed and one hand 'palm up' gestures, the former being preferred by some of the speakers, while the typical one-hand 'palm up' is often associated with discourse markers such as 'donc' (thus) or 'par contre' (on the contrary), a feature that is not characteristic of the learners' corpus. The gesture is also used to present content but no occurrences of a pointing hand were found. Native speakers do use however some representational gestures to depict an object or an action that is relevant to the topic. Without taking other factors into consideration (for example, the small size of the native corpus), these findings suggest that these two groups of speakers may use 'palm up' hand in different ways, although this may not be necessarily tied to language ability.

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What do emblems do? A tentative approach towards the functions of emblems and recurrent gesture

This talk attempts to give an overview about some of the functions of emblems and recurrent gestures, their differences and similarities. We will resume what has been found out about emblems or quotable gestures, their form-meaning stability and their communicative functions (Kendon 1981, Kendon 1992, Brookes 2004, 2005, Payrató 1993, 2004, *inter alia*). According to these studies it seems that most emblems are suited to meet interactive and communicative needs, that is, that they are mainly used to regulate the behavior of others, to display one's own mental or physical state, and to evaluate the actions or the behavior of others (see also Teßendorf 2008).

With the publication of Adam Kendon's (1995) article about gestures that serve as discourse and illocutionary force markers, a rather understudied "class" of gestures came into focus. Case studies of gestures appeared, which seemed to be situated in between the categories of emblems and so-called spontaneous gestures (see Müller 2004 for the "palm-up-open-Hand", Müller & Speckmann 2002 for the "brushing aside gesture" in Cuban Spanish, Müller, Bressen & Fricke in prep. for recurrent gestures of exclusion and negation in German, Montes 2003 for diverse "setting aside" gestures, Seyfeddinipur 2004 for the "pistol hand" in Iran, Ladewig 2006 for the "cyclic gesture" in German, Teßendorf 2005 for the "brushing aside gesture" in Iberian Spanish, and, in a more general approach, Streeck 1994). We will call them recurrent gestures in the following (see Ladewig *fc.*). They differ from spontaneous gestures in that they have a stable form-meaning pairing and that they seem to be used primarily for interactional purposes, just as emblems do. They also seem to be able to stand on their own, without accompanying speech and therefore share some of the main features formerly ascribed to emblems, only. But, in opposition to emblems, these gestures are most often used in conjunction with speech and act upon it in a meta-communicative manner. And, as Streeck (2005, 2009) points out, they seem to be used in passing, "as a background activity" (Streeck 2009: 151) while speaking, which clearly contrasts the intentional and even pursuable use of (certain) emblems.

The talk will thus revolve around the differences and similarities of emblems and recurrent gestures. By considering Payrató's work on the repertoire of Catalan emblems (1993), which also addresses the development of standardization and emblemization of spontaneous gestures, possible routes of recurrent gestures towards standardization will be discussed.

References

- Brookes, H. (2001). The case of the *clever* gesture. *Gesture* 1(2), 167–184.
- Brookes, H. (2004). A repertoire of South African quotable gestures. *Journal of Linguistic Anthropology* 14 (2), 186–224.
- Brookes, H. (2005). What gestures do: Some communicative functions of quotable gestures in conversations among Black urban South Africans. *Journal of Pragmatics* 32, 2044–2085.
- Kendon, A. (1981). Geography of gesture. *Semiotica* 37-1/2, 129–163.
- Kendon A. (1992). Some recent work from Italy on quotable gestures (emblems). *Journal of Linguistic Anthropology* 2,1, 92–108.
- Kendon, A. (1995). Gestures as illocutionary and discourse structure markers in Southern Italian conversation. *Journal of Pragmatics* 23, 247–279.
- Ladwig, S. H. (2006). Die Kurbelgeste – konventionalisierte Markierung einer kommunikativen Aktivität. Unpublished MA thesis, Free University Berlin.
- Ladewig, S. H. (forthcoming) Putting a recurrent gesture on a cognitive basis. *CogniTertes*.
- Montes, R. (2003). "Haciendo a un lado": gestos de desconfirmación en el habla mexicano. *IZTAPALAPA* 53, 248-267.

- Montes, R. (2004). The Palm-Up-Open-Hand. A case of a gesture family? In Müller, C. & R. Posner (Eds.), *The semantics and pragmatics of everyday gestures*. Berlin: Weidler, 233–256
- Müller, C. & G. Speckmann (2002). Gestos con una valoración negativa en la conversación cubana. *DeSignis* 3. Buenos Aires: Gedisa.
- Müller, C., Bressemer, J. & E. Fricke (in prep.). “No, not, none of that” – cases of exclusion and negation in gesture.
- Payrató, L. (1993). A pragmatic view on autonomous gestures: A first repertoire of Catalan emblems. *Journal of Pragmatics* 20, 193–216.
- Payrató, L. (2004). Notes on pragmatic and social aspects of everyday gestures. In *The semantics and pragmatics of everyday gestures*. In: Müller, C. & R. Posner (eds.), Berlin: Weidler, 103–113.
- Seyfeddinipur, M. (2004). Meta-discursive gestures from Iran: Some uses of the ‘Pistol Hand’. In Müller, C. & R. Posner (eds.), *The semantics and pragmatics of everyday gestures*. Berlin: Weidler, 205–216.
- Streeck, J. (1994). “*Speech-handling*”: The metaphorical representation of speech in gesture. A cross-cultural study. Unpublished manuscripts.
- Streeck, J. (2009). *Gesturecraft – The manu-facture of meaning*. Amsterdam: John Benjamins.
- Teßendorf, S. (2005). Pragmatische Funktionen spanischer Gesten am Beispiel des “gesto de barrer”. Unpublished M.A. thesis, Free University Berlin.
- Teßendorf, S. (2008). Pragmatic and metaphoric gestures – combining functional with cognitive approaches. Unpublished manuscript.

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Gestures of Korean emotion metaphors: A case study for anger and happiness

Earlier studies have already argued that metaphors are not just a phenomenon of verbal language (c.f. Cienki 2005, 2008; Cienki & Müller, 2008; Gibbs, 2008; Müller & Cienki, 2009); rather the interaction between metaphoric language and gesture plays an important role in providing plausible evidence for cognitive semantics, namely, the embodied nature of meaning and the grounding of abstract conceptions in perceptual and motor experience (Langacker, 2008). Accordingly, Lakoff (2008) notes that metaphoric gestures provide evidence – independent of words – for the theory of conceptual metaphors. This study examines the metaphoric gestures for two emotion concepts, namely ANGER and HAPPINESS in Korean. Türker (2009) examined the metaphorical expressions of ANGER, HAPPINESS and SADNESS in Korean based on a detailed corpus-based analysis. The earlier research presented central and submetaphors of emotion concepts and provided a detailed analysis of source vs. target domains of each emotion metaphor. It is claimed that although Korean emotion metaphors manifest significant similarity in the source vs. target domains via universal metaphors, their specificity in relation to each other can nevertheless be assessed with the help of a quantitative distributional analysis of the frequencies as well as productivity occurrence of metaphoric expressions associated with each of the concepts under study. The results of the earlier study indicated that to a considerable extent Korean emotion metaphors support the universality of conceptual metaphor theory; however, such emotion domains also have individual features with their own characteristics governed by the Korean cultural model. In connection to the earlier research analysis, the aim of the present study is to provide further non-linguistic evidence for the emotion metaphors by investigating Korean gestures. I will specifically concentrate on the kinds of relations that appear in speech and/or gesture in case of ANGER and HAPPINESS metaphors. In particular, I identify Korean gestures which have developed fixed meanings in the culture for expressing emotions, rather than the ones produced spontaneously and are highly dependent on context. The research questions are i) What type of gestures does Korean employ in expressing ANGER and HAPPINESS; ii) to what extent these gestures coincide with emotion-related conceptual metaphors which I have identified with the corpus analysis iii) to what extent Korean co-verbal gestures represent or indicate the source domain of emotion metaphors. The data is collected from regularly broadcast Korean TV programs. Television programs such as talk shows, dramas or documentaries prepared for adult audiences are recorded and analyzed for gesture identification. Each gesture examined from the moment articulators begin to depart from a position of rest or completion until the moment when they return to rest, thus accounting for what Kendon (2004) calls a “gesture unit.” Identified gestures are coded in terms of the different types of features that can describe a gesture for each emotion metaphor. The results indicate that Korean gestures can be a source of conceptual metaphors of emotions which are motivated by the universal embodied experiences and cultural beliefs or understandings, which may or may not be appear in verbal expression in speech.

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The role of gesture in expressing locative information

This talk examines how English and French speakers use co-speech gestures to express locative information. We know surprisingly little about how this occurs, even though we are often required to communicate the locations of objects and landmarks in our everyday lives. Drawing on an experimental study in which participants described two spatial scenes to an addressee, this paper shows that speakers recurrently use gesture to express unlexicalised directional information. This information complements the locative semantics of the co-occurring lexical spatial item(s), thereby enabling a finer-grained locative expression. There are recurrent ways in which this occurs. For example, speakers use the prepositions *between* and *entre* to encode the location of an object (the 'Figure', following Talmy 2000), in relation to two reference objects (the 'Ground', *ibid*). However, *between* and *entre* can encode location along any of the three spatial axes: that is, along the vertical (up/down), frontal (front/back) or lateral (left/right) axes. Therefore, when speakers need to provide clear and unambiguous locative information – as they were required to do in this study – they should specify which of these spatial axes underlies the use of the preposition. The results presented here show that English and French speakers provide such clarification in gesture only, by marking the isomorphic locations of the two Ground entities in gesture space. This common pattern of gesture production suggests the comparable semantic networks of *between* and *entre*. Further evidence for the role of gesture in the expression of directional information emerges from an analysis of how speakers use *next to* and *à côté de*. Speakers typically recruit these prepositions to encode a Figure's adjacency to a Ground along the lateral axis. However, neither of these prepositions encodes whether the Figure is to the right or to the left of the Ground: this information recurrently emerges in gesture alone.

By presenting examples of these particular speech/gesture locative combinations, this paper shows that speakers habitually use gesture to express directional locative information. This information is not only unlexicalised, but is also pivotal to the correct depiction of the Figure's location. The results therefore highlight an understanding of speech and gesture as complementary modalities which communicate different aspects of a single, unified locative message (see McNeill 1992, 2005; Kendon 2004).

References

- Kendon, A. (2004). *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
 McNeill, D. (1992). *Hand and mind. What the hands reveal about thought*. Chicago: University of Chicago Press.
 McNeill, D. (2005). *Gesture and thought*. Chicago: University of Chicago Press.
 Talmy, L. (2000). *Toward a Cognitive Semantics*. Cambridge, MA: MIT-press.

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On embodiment of onomatopoeia: Its cognitive developmental implication

In this talk we would like to introduce and describe highly embodied linguistic expressions with onomatopoeia, and consider how effectively they are exercised with gesture and phonetic characteristics in order to stimulate communicative activities of children with language impairment.

Onomatopoeia has rather been understudied in linguistics, especially in formal theories of grammar. Onomatopoeia is sound-symbolic lexicon phonologically and morphologically governed by rules: 'pocha-pocha' (chubby), 'kira-kira' (twinkle-twinkle), etc., the sort of vocabulary quite frequently uttered in everyday life to convey vivid sensory images of what the speaker wants to express in communication.

Onomatopoeia has long been underestimated, often thought childish or too informal to use in educational contexts, which seems to be why the expressions tended to be neglected in theoretical studies. We think it quite important that we should be reminded that bodily expressions play important roles when children acquire various kinds of ability to communicate with the outside world. The knowledge and exercise of onomatopoeia even seems to be the prerequisite to the acquisition of proper, more developed form of the language later.

Investigating the relation between language development and linguistic properties of onomatopoeia, we believe it valid to observe children with mental retardation; they show us how linguistic ability is developed over a very long time span. We think we may be to encounter a situation where onomatopoeia triggers the child's communicative ability, especially in the context of education: the embodied expressions often encourage handicapped children to communicate with their teachers or peers. In order to get empirical data, we conducted visits to schools for handicapped children in Japan, and also in Korea. Audio-visual data was recorded where possible.

Our work will deal with the episode-description of the discourse where the bodily linguistic expressions are effectively used in communicative interactions, which often seem to facilitate children's activities. We will then try to analyze how the utterances with onomatopoeic expressions are actually performed in terms of their prosody and gestures. This should give us clues to understand what properties of bodily language inject developmental impact in communicative ability.

Certain onomatopoeic utterances by the teachers are articulated in quite an eloquent manner, uttered with particular prosodic and musical characteristics, accompanied by gestures to go with the verbal rhythm, sometimes reminiscent of articulatory manner, especially with regard to plosive sounds in word-initial or word-final positions, seemingly some kind of sound-symbolic manifestations of gestures. All these seem to contribute to catch the hearer's attention, i.e. forming a kind of joint attention between the children and the teachers. We will show some audio-visual data in order to demonstrate the interesting characteristics.

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About the phylogeny of human expressive behavior

Psychiatry approached the psycho-motor phenomena derived from the psycho-pathology. But, the early descriptions were vague and initially confined just to para-kinetic compared to normal behavior. Dissatisfied Karl Leonhard (1904-1988) created a description of facial expressions, gestures, and phonics in everyday behavior. It goes far beyond what dominated the psychological literature since the sixties.

Starting from the relationship between sender and receiver of the nonverbal communication, four groups can be found that follow one another and use the previous mechanisms of expression: vegetative expressions (the psycho-motor part of somatic reactions), affections (the psycho-motor stake of the emotions), judgments (the demonstration of valuations) and intentions (the steering of an interpersonal relationship). In the first two stages an increasing refinement of the representation mechanisms is found, in the third just combinations, in the fourth a coarsening of the embodiment of the experiences.

This applies to facial expressions, gestures, and phonics as well. That allows to estimate the phylogenetic age of an expressive phenomenon.

These groups correspond with the historic development of social relationships and form an ancillary communication channel aside the verbal language.

In modern life the unreflected expressions do not dominate the nonverbal communication, but showmanship within social conventions. The contents of these behaviors are maneuvers (the conscious use of formerly unreflected expressions), as well as locally and temporally differing sign language gestures. Through the formation of habits, that can become an unconscious behavior.

All this is overlaid by solidified specificities: Anatomical features, scars, habits, aging processes. Prior to the assessment of a gestural phenomenon; therefore, an analysis of multiple overlays must be done.

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Speech/gesture coordination in deictic pointing

This study is a behavioural experiment on spoken language in adults, questioning the interaction processes between speech, gesture and language in the deictic function. It investigates the correlation between the shape of the gestural pointing, the shape of the vocal pointing, and the distance of the pointed object, in a deictic production task. It also questions the nature of the iconicity of demonstrative words in the world's languages.

We carried out an experimental study in a soundproof room, where three Light Emitting Diodes were placed at three different distances from the subjects (close in the peri-personal space, mid and far, in the extra-personal space). The subjects were asked to point at and/or name the turned-on LED (2 tasks: speech only vs speech + gesture), with a sentence containing either a deictic word or a non-word (2 word-types: "it is there", "it is pa"), to a dummy placed in the room in order to emulate a real communication situation. The lip opening distance as well as the first and second formants of the vowel /a/ have been recorded. Kinetic properties of the manual gestures have also been recorded with an Optotrak system. The data for 12 subjects have been analyzed with a repeated-measures Anova with 3 fixed factors: task, word-type and distance.

The first hypothesis was that, if the vocal and gestural systems are cooperating within the process of deixis, lip opening and formant values would show larger variations for speech only than for speech+gesture. The second prediction was that these values would vary as a function of the pointed LED's distance from the subjects. We were expecting larger F1 values and lip opening for farther distance. This hypothesis being based on typological studies, which indicate that increasing distance is favourably correlated with opening of vowels in demonstratives (Diessel, 1999, Woodworth 1991, Traunmüller 1996).

The first results show that lip opening varies with the task. Lip opening is significantly larger when the subjects are producing speech only than when they are producing speech and gesture, which means that they compensate for the absence of manual gesture with a reinforced vocal gesture. Furthermore, lip opening and F1 increase significantly with distance. The further the pointed object, the more open the lips, and the higher the first formant.

These results are showing that vocal and manual gestures are two cooperating modalities, which are used in a complementary and not redundant way for the implementation of the linguistic function of deixis. They are thus in favour of an online interaction process between the gesture generator and the speech generator, as proposed in Kita & Özyürek (2003). The results also suggest that the universal tendency of languages worldwide to use open vowels for distant objects, and close vowels for close objects might be rooted in this interaction between the vocal and gestural modalities.

Further developments of this study include evaluating the variations of the shape of the manual gesture with regards to speech, and to the spatial properties of the target of pointing.

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Use of metaphoric gestures in an architectural design meeting: Expressing the atmosphere of the building

More and more studies show that people use gestural metaphors in interaction (Cienki & Müller, 2008). In this paper, based on video data collected in a professional working setting, we examine how an architectural designer, in a project meeting with two clients, uses metaphoric gestures in order to convey certain attributes of the building under design, especially certain abstract qualities, such as the atmosphere of the building. The project concerned the design of a crematorium. Examples of atmosphere-related qualities that Adam, the architect, happens to express through metaphoric gestures are the bold, intimate, or private character of the building or of one of its spaces. In the study presented, we will examine if such atmosphere-related qualities are conveyed systematically through gesture or also in other modes, combined with a gesture or not. If they are also expressed without a gesture, we will analyse the specific possibilities offered by gesture, compared to other expression modes (such as verbal).

In the example of intimacy, Adam conveys it both with and without a gesture. The first time he—and, some seconds later, one of his clients—refers to the intimacy of a space—the sanctuary for the very small funerals—he expresses it only verbally, relating it to the size of the sanctuary (if we make it too big it loses its sort of intimacy; I quite like the idea of a smaller place so the intimacy on that). The second time, Adam makes a particular sphere-shaping gesture while he says but if it's stained glass it'll be a much more intimate space. We analyse the first reference to the intimate character of the sanctuary as sufficiently clear through its relationship to the size of the space (The Size of a Space Determines {the Ease of} its Ability of Intimacy). For his second representation of the sanctuary as intimate, Adam pleads—verbally—for the contributory relationship between stained-glass windows and the intimacy of a space. The basis of this relationship remains implicit: Adam does not try to justify it. What he does by his gesture is to add to this further characterisation of the sanctuary as intimate through an expression of intimacy as protecting. To do so, he uses a gesture through which he expresses intimacy as a space enclosed in a protecting container. Here the concept of protection is expressed metaphorically by what might be a gesture—or perhaps rather an action—that an adult makes in order to shield a child that she/he is holding. Not only underlying the second expression of intimacy, but also underlying the first one, we can identify the conceptual metaphor Emotional Intimacy is Physical Closeness. It is indeed easier for smaller spaces than for bigger spaces to bring people physically close to one another.

We will apply similar analyses to the expression of the other atmosphere-related qualities attributed in the meeting (mostly by the architect).

References

Cienki, A. J., & Müller, C. (2008). *Metaphor and gesture*. Amsterdam: John Benjamins.

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Three layers of significance revealed through a semiotic analysis of gesture-word mismatches in dialogues between Israeli Arabs and Jews

In this research, cases of gesture-word mismatches in conflict situations, taken from a series of video-recorded sessions between Israeli-Arab and Israeli-Jewish students, were analyzed using the theory of Phonology as Human Behavior (PHB) of the Columbia School (CS) sign-based theory of linguistics (e.g. Davis 2006, Tobin 1990, Tobin & Schmidt 2008) and the theory of Word Systems (e.g. Aphek & Tobin, 1988). These approaches were originally designed for the study of linguistic signs. The present study, however, includes bodily signs in its analyses.

The author is both a linguist and a dance-movement therapist which gives her a holistic perspective on the linguistic text that includes the adaptation of various movement analyses that are used in the field of dance movement therapy. Therefore this study contributes to our understanding of linguistic/non-linguistic mismatches in situations of conflict and may pave the way for similar research in sociology, socio-linguistics, psycholinguistics, and political science.

According to Goldin-Meadow (2003) mismatches occur when gesture and speech convey different information. One of McNeill's mismatch experiments revealed that listeners were prepared to go to a "quite radical length" to avoid conflict between the modalities, to come up with a message that avoided the contradiction caused by the mismatch between them. In fact, the gestures of the speaker were unconsciously taken in, aiming to recover the conveyed meaning (McNeill 1992:143).

The present study examined the occurrence of word/gesture mismatches using a large corpus of natural spoken and audiovisual recorded data. Mismatches seem to point to a state in which the speaker's high emotional state leads to a search of a different, highly emotive means of expression. This conclusion is consistent with Goldin-Meadow's claim that mismatches serve as a signaling of a transitional state (Church & Goldin-Meadow, 1986; Goldin-Meadow et al., 1993; & Goldin-Meadow, 2003). Interestingly, in the context of learning processes, she found that mismatching actually helps the learner formulate new ideas. Indeed, the mismatch phenomena mark a point of significance in the text and act like a guide, revealing islands of significant events, of emotionally significant interactions.

Mismatches between verbal and non-verbal modalities provide a rich and promising area of research for many and diverse fields. The role of the mismatches in the text can be regarded as a crack in the glass, or a slit in the fabric that engulfs the speech production process. Analyzed through the theories of PHB and CS sign-based theories and the semiotic framework of Word Systems, mismatches were found to mark a point when the speaker reveals the depths of the multiple layers that compose the complex act of speech production.

References

Aphek, E. & Tobin, Y. (1988). *Word Systems in Modern Hebrew*. Leiden/New York: E.J. Brill.

Church, R.B. & Goldin-Meadow, S. (1986). The mismatch between gesture and speech as an index of transitional knowledge. *Cognition* 23: 43–71.

Davis, J., (2006). Consistency and change in Columbia School linguistics. In Davis, J., Gorup, J.R., & Stern, N. (eds.) (2006). *Advances in Functional Linguistics, Columbia School beyond its origins*. Amsterdam, Philadelphia: John Benjamins.

Goldin-Meadow, S., Alibali, M.W. & Church, R.B. (1993). Transitions in concept acquisition; using the hand to read the mind in: *Psychological Review*. April, 100 (2) pp. 279–297.

- Goldin-Meadow, S. (2003). *Hearing gesture—how our hands help us think*. Cambridge, MA/London: Harvard University Press.
- McNeill, D. (1992). *Hand and mind—what gestures reveal about thought*. U.S.A.: The University of Chicago Press.
- Tobin, Y. (1990). *Semiotics and Linguistics*. London/New York: Longman.
- Tobin, Y., & Schmidt, J. (2008). The language of paradox: interpreting Israeli psytrancers unspoken discourse. *Israel Studies in Language and Society*, 1(1): 103–116.

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How to do things with words and gesture – Bimodal speech acts

Cognition is the basis of speech and gesture as co-produced and co-perceived channels of communication. While gesture semantics receive much attention, to date no systematic account of pragmatic form and function of gesture has been given. Previous analyses of gesture pragmatics (i) spotlight interactive gesture (Bavelas et al., 1992) and (ii) are unconcerned with modifying prevalent speech act theoretical assumptions (cf. Austin, 1962; Searle, 1996). I investigate full and partial speech act functions of three gesture categories: content gesture, emblem and discourse structuring gestures (cf. Wehling, 2009; DSG, henceforth), analysing their relation to propositional content and illocutionary force. I show that specific gestures (i) add to content, (ii) enforce or modify illocutionary force or (iii) embody content and force as autonomic speech acts.

(I) Content gestures contribute to the propositional content of a speech act, by depicting speech content or introducing new content.

(II) Emblems (cf. Kendon, 2004) may function as autonomic speech acts. E.g., performing the *thumbs up* sign as an EXPRESSIVE, the semantics being ‘well done’. Shared access to the communicative act is provided via cognitive frames that structure social knowledge and context. (I.e., the above emblem performed by an emperor in ancient Rome means ‘he may live’, not ‘well done’.) Further, emblems change illocutionary force as do utterances. E.g., “Hey!” functions as GREETING or WARNING depending on context and prosodic features and so does a hand wave (including gestural performance mode, or: *gesture* prosody, cf. Wehling, 2009). Emblems also function as COMMISSIVES in relation to constitutive rules. E.g., raising an index finger in an auction (context) puts one under obligation to buy (via constitutive rule). My work further shows that emblems act as the sole illocutionary force of a COMMISSIVE with the content lying in the utterance (cf. i) and modify the speech act force (cf. ii,iii):

- (i) Performative emblem changing speech act from DECLARATIVE to COMMISSIVE
Forming the I swear sign while uttering a sentence that does not contain a performative:
“I did not eat the cookie.”
- (ii) Emblem that must accompany spoken performatives in institutionalised context
E.g., Swearing-in in court, religious ceremony
- (iii) Emblem functioning against COMMISSIVE
Crossing one’s fingers while swearing.
- (III) My categorization of DSG speech act functions draws from analyses of political interviews. I show that co-speech DSG may accentuate illocutionary force of direct speech acts or bring to surface the covert force behind indirect speech acts, as in this example from a George W. Bush interview:
- (iv) Context: interviewer interrupts George W. Bush during his utterance
Utterance tier: “May I finish?” [overt: QUESTION; covert: DIRECTIVE]
Gesture tier: metaphoric hold and push back gesture [illocutionary force: DIRECTIVE]
Thus, DSG provide visual cues (bimodal perception) to access speaker intention (bimodal production) based on shared conceptual structures like metaphor (here: the manual push gesture based on Speaking is Forward Movement). I further introduce instances of DSG functioning as autonomic speech acts, direct and indirect.

References

- Austin, John. 1962. *How to do Things with Words*. Oxford: Clarendon.
- Bavelas, Janet Beavin, Nicole Chovil, Douglas A. Lavrie and Allan Wade. 1992. Interactive Gestures. *Discourse Processes*, 15/4, 469–489.

- Grady, Joseph. 1997a. *Foundations of Meaning: Primary Metaphors and Primary Scenes*. Ph.D. dissertation, University of California, Berkeley.
- Johnson, Mark and George Lakoff. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.
- Kendon, Adam. Gestures as illocutionary and discourse markers in Sothorn Italian conversation. *Journal of Pragmatics*, 23, 247–279.
- Kendon, Adam. 2004. *Gesture. Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Lakoff, George and Elisabeth Wehling. 2006. *Auf leisen Sohlen ins Gehirn*. Heidelberg: Carl-Auer.
- McNeill, David. 1992. *Hand and Mind. What Gestures reveal about Thought*. Chicago: University of Chicago Press.
- Searle, John R. 1969. *Speech Acts. An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press.
- Sweetser, Eve. 1998. *Regular Metaphoricity in Gesture: Bodily-based Models of Speech Interaction*. In: Actes du 16^e Congrès International des Linguistes, Elsevier.
- Wehling, Elisabeth. 2009. Argument is Gesture War. Function, Form and Prosody of Discourse Structuring Gestures in Political Argument. In: Proceedings of the 35th Annual Meeting of the Berkeley Linguistics Society (in preparation). Berkeley.

Data

- Interview with Bill Clinton on FOXnews Sunday (09/11/2009):
http://www.youtube.com/results?search_query=clinton+interview
- Interview with George W. Bush on RTE Ireland (09/11/2009):
<http://www.youtube.com/watch?v=Mp4vLBvU1bA&feature=related>
- Hillary Clinton / Barack Obama CNN Debates 2008 (09/11/2009):
<http://www.youtube.com/watch?v=mb3JHexXljk&feature=related>

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Bodily display of emotions as an interactional tool

In this paper we will present a study of how body communication involving gesture is used in communicating emotions. The data is from a clinical setting involving interlocutors participating in a naming task. The interlocutors are a four year old boy with specific language impairment with word finding difficulties and a speech and language therapist. Our analysis will focus on several points in the interaction in which the boy appears to have difficulties finding the right words. Thus he explicitly says “I can’t” or alternatively “I don’t know” and meanwhile showing signs of frustration through his body communication. The interesting feature though is that he more or less simultaneously is capable of displaying ‘positive feelings’ as well. The analysis will focus on the various emotional cues (Planalp 1999) he uses in this process in particular gesture, body movements as well as facial and vocal cues. Even though he has great difficulties in performing the naming task, he apparently manages to display an involvement and a willingness to interact. We would like to argue that the fact that he seems to display positive emotions while verbally expressing frustration. This suggests that he employs a meta-knowledge about the interactional situation in the sense that even though he can’t perform the task, he is orientated towards “keeping the interaction going”. In other words he is demonstrating alignment (Goodwin 2007) and pragmatic competence through his body communication. In our analysis and subsequent discussion we would like to address the following questions: What do we mean by emotional communication in terms of body movements and emotional cues? How do we interpret gestures and other kind of movements as displays or expressions of emotional states – as for instance frustration vs. positive feelings? How do we distinguish between communication of emotions and emotional communication? The method used is a primarily interactional approach to gesture and communication (Cienki 2008, Streeck 2009) which focuses on different types of body communication such as body posture, head movements, gaze direction, facial expression and arm and hand movements (Kita 2000, McNeill 1992, Månsson 2003).

References

- Cienki, A. (2008): “Why study metaphor and gesture?”. In A. Cienki & C. Müller (Eds.) *Metaphor and Gesture*. Amsterdam/Philadelphia: John Benjamins.
- Goodwin, C. (2007): “Environmentally Coupled Gestures”. In S. Duncan, J. Cassel, and E. Levy (Eds.) *Gesture and the Dynamic Dimensions of Language*. Amsterdam/Philadelphia: John Benjamins: 195–212.
- Kita, S. (2000). How representational gestures help speaking. In D. McNeill (Ed.), *Language and gesture*. Language, culture and cognition (pp. 162–186). Cambridge: Cambridge University Press.
- McNeill, D. (1992): *Hand and Mind. What Gestures reveal about Thought*. Chicago: University of Chicago Press.
- Månsson, A-C. (2003). *The relation between gestures and semantic processes*. Gothenburg Monographs in Linguistics 23.(PhD dissertation). Göteborgs universitet
- Planalp, S. (1999): *Communicating Emotion. Social, Moral and Cultural Processes*. Cambridge: Cambridge University Press.
- Streeck, Jürgen (2009): *Gesturecraft. The manu-facture of meaning*. Amsterdam/Philadelphia: John Benjamins.

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Gesture in everyday scientific reasoning and explanation

My research focuses on the functions of gesture in everyday problem solving and in communicating with and teaching others. I approach these topics from the perspective of distributed cognition, showing how gestures coordinate conceptual models with environmental structures to produce functional outcomes (Hutchins, 2005; Williams, 2008b), and from the perspective of cognitive linguistics (emphasizing image schemas, mental spaces, and conceptual integration [Fauconnier & Turner, 1998, 2002]), showing how gestures guide conceptual mapping and anchoring in the quest for common ground and mutual understanding (Williams, 2007, 2008a).

The present study focuses on the question: How does gesture function in everyday scientific reasoning and the communication of scientific ideas? To explore this question I have made videorecordings of small groups of college students discussing and explaining their answers to such questions as “What causes the seasons?” “What causes the phases of the moon?” and “What causes the tides?” These questions involve consideration of the relations among multiple entities—the sun, earth, and moon—and their relative motion and effects on one another in a three-dimensional space. In responding to these questions, students must negotiate their conceptions of the situation, including such common misconceptions as the earth being closer to the sun in the summer (vs. the earth tilting toward or away from the sun), the earth casting its shadow on the moon (as producing the crescent moon vs. an eclipse), and the gravitational effect of the moon being the sole cause of tidal motion (disregarding the lesser effect of the sun and how it aligns with the moon). These prompts elicit many gestures from students during both the discussion and explanation phases of the activity.

The gestures produced by students are analyzed in terms of their conceptual functions in the problem-solving and communicative situation. Particular attention is paid to gestures that contribute to referential meaning (in the sense of chapters 9 and 10 of Kendon [2004] but analyzed here from the perspective of distributed cognition and conceptual integration theory). Preliminary findings include students producing gestures to anchor their own reasoning, copying and elaborating the gestures of others in communicating and coordinating their conceptions (establishing shared cognitive artifacts), and gesturing together in a shared space when describing the relative motion of the sun, earth, and moon simultaneously. These findings will be discussed in terms of their implications for our view of gesture and its functions in human activity.

References

- Fauconnier, G. & Turner, M. (1998). Conceptual integration networks. *Cognitive Science*, 22(2), 133–187.
- Fauconnier, G. & Turner, M. (2002). *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*. New York: Basic Books.
- Hutchins, E. (2005). Material anchors for conceptual blends. *Journal of Pragmatics*, 37(10), 1555–1577.
- Kendon, A. (2004). *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Williams, R. F. (2007). Using mapping and anchoring gestures to establish common ground. Paper presented in the panel on “common ground” at the 3rd conference of the ISGS, Northwestern University, June 18–21.
- Williams, R. F. (2008a). Gesture as a conceptual mapping tool. In A. Cienki & C. Müller (Eds.), *Metaphor and Gesture* (pp. 55–92). Amsterdam: John Benjamins.
- Williams, R. F. (2008b). Situating cognition through conceptual integration. Paper presented at the 9th conference on Conceptual Structure, Discourse, and Language, Case Western Reserve University, October 18–20.

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The use of the notion ‘phoneme’ for the description and analysis of signs and gestures

Sign language phonology is an established discipline in sign language linguistics. It is common practice to apply phonological notions, categories and theories of spoken language to sign language (for ASL, Liddell & Johnson (1989); for DGS, Becker & Hessmann (in prep.); for IPSL, Zeshan (2000)). Nowadays there is a growing interest in applying the so-called ‘parameters of sign language’, which are taken to be functionally equivalent to phonemes, to the analysis of gestures as well (cf. Müller (2004), Fricke (2008), Ladewig & Bressems (subm.)). This is one of the rare studies in which results from an analysis based on sign language linguistics are fruitfully transferred to a branch of spoken language linguistics, namely gesture studies – usually the transfer process works the other way round.

This fact provides the reason for revising the status of phonological categories in sign language linguistics by contrasting different theoretical approaches in papers selected from the literature on sign language. In particular, the revision that I have carried out challenges the applicability of the notion of the ‘phoneme’ to sign language phonology, because

- sign languages do not seem to have phonological entities that are systematically comparable to those detected by early structural linguists in their analyses of spoken language;
- due to the simultaneity, common phonological processes (e.g. the neutralisation process) do not occur and representative tests (e.g. the substitution test) cannot be applied;
- three of the four common phonemes that occur in sign language can be interpreted as parts of other phonemes;
- movements of the face, the eyes, the shoulders and the head can also be used to instantiate distinctiveness.

The results of the revision show that the usefulness of categories like hand form, movement, place of articulation and orientation as analytic tools for detecting and describing both gestures and signs is documented and undeniable (Prillwitz & Zienert (1999), Müller (2004)), whereas their analytical status in sign language phonology has to be reconsidered. We have to deal with the fact that gestures and signs are not arbitrary, but motivated symbols. I will sum up the consequences of maintaining a phonological theory by comparing spoken language onomatopoeics and the semiotics of different types of signs. In a second step, these findings will be transferred to throw light upon the semiotics of gestures as well. As a result, semiotic differences and similarities between gestures and linguistic signs in both the vocal and the kinesic modalities will be shown.

References

- Becker, C. & Heßmann, J. (in prep.). Sign phonology: The formational characteristics of signed languages. In: T. Johnston, A. Schembri, G. Turner (eds.). *Sign Linguistics: An Introduction*. Edinburgh: Edinburgh University Press.
- Fricke, E., 2008. Grundlagen einer multimodalen Grammatik des Deutschen: Syntaktische Strukturen und Funktionen [professorial dissertation; will be published by de Gruyter in 2010].
- Ladewig, S. H. & Bressems, J. (subm.). Discovering structures in gestures on the basis of the four Parameters of Sign Language.
- Liddell, S. K. & Johnson, R. E., 1989. American Sign Language: The phonological base. *Sign Language Studies*, 64; 195–277.
- Müller, C., 2004. Forms and uses of the Palm Up Open Hand: A case of a gesture family? IN: C. Müller, R. Posner, (eds.). *The semantics and pragmatics of everyday gestures*. Berlin: Weidler.
- Prillwitz, S. & Zienert, H., 1990. Hamburger Notation System for Sign Language: Development of a sign writing computer application. In: S. Prillwitz, T. Vollhaber, (eds.): *Current Trends in European Sign Language Research. Proceedings of the 3rd European Congress on Sign Language Research*. Hamburg: Signum; 355–380.
- Zeshan, U., 2000. *Sign Language in Indo-Pakistan. A Description of a Signed Language*. Philadelphia/ Amsterdam: John Benjamins Publishing Company.

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Iconic gestures resolve lexical ambiguity: Comparison of gestures accompanying homonyms and non-homonyms

Gestures convey semantic content for both the speakers and listeners (McNeill, 1992; Goldin-Meadow, 2003; Thompson & Massaro, 1994; Cohen & Harrison, 1973). When presented with short stories containing homonym nouns (e.g., bark that refers to either the sound made by a dog or the branches of a tree), young children and adults produced gestures to convey the semantic meanings of those homonyms (Holler & Beattie, 2003; Kidd & Holler, 2009). However, previous studies did not include a control condition in which the participants were presented with non-homonyms (e.g., “dog” and “tree”) that were semantically-related to the homonyms (e.g., “bark”). Thus, it is not clear whether the participants would gesture the homonyms more often than non-homonyms. If so, we would have strong evidence showing that gestures resolve lexical ambiguity. This study addressed this issue by testing non-homonyms as well. In addition, each homonym has its own dominant and subordinate meanings. Thus, we investigated whether the participants gestured dominant and subordinate meanings of homonyms equally often.

We identified fifty-two homonyms and their dominant and subordinate meanings according to Foss and Jenkins (1973). Each homonym was paired with two non-homonyms that were semantically-related to its dominant and subordinate meanings. The non-homonyms were derived from the words listed in free association norms (Nelson, McEvoy, and Schreiber, 1998). All the homonyms and non-homonyms were concrete nouns. Then we made three sentences for each homonym and its associated two non-homonyms. The sentence structure was the same, e.g., His bark was unusual (homonym); his dog was unusual (non-homonym semantically related to the dominant meaning); his tree was unusual (non-homonym semantically related to the subordinate meaning). Altogether, there were 208 sentences of 4 types: 1) homonyms carrying dominant meaning; 2) homonyms carrying subordinate meaning; 3) non-homonyms carrying dominant meaning of homonyms; and 4) non-homonyms carrying subordinate meaning of homonyms.

Eighteen participants participated in this study and each of them was asked to describe 52 sentences (13 of each type) to a naïve listener. A picture that helped the participants to identify the meaning of words (particularly the homonyms) was presented prior to each sentence. The whole experiment was videotaped and speech and gestures were coded.

The participants produced similar number of words when describing homonyms and non-homonyms, $t(17)=1.56$, $p=ns$. All participants produced gestures, particularly iconic gestures and beats. We looked at the number of co-occurring gestures referring to the homonyms and non-homonyms per sentence. The participants produced significantly more iconic gestures when referring to the homonyms ($M=1.34$, $SD=.02$) than when referring to the non-homonyms ($M=.81$, $SD=.03$), $t(17)=2.76$, $p=.02$. They also produced slightly more beats ($M=1.12$, $SD=.03$) when referring to the homonyms than when referring to the non-homonyms ($M=.95$, $SD=.04$) but the difference was not significant, $t(17)=1.41$, $p=ns$. Among the sentences with homonyms, there was no significant difference in iconic gestures and beats between dominant and subordinate meaning. Thus far, the participants produced more iconic gestures when conveying semantic meanings of homonyms than when conveying their semantically-related non-homonyms. As a result, our findings suggest that gestures resolve lexical ambiguity.

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Differences in frequency of ‘ring’ gesture use across experienced and inexperienced speakers in academic English presentations

As interest in functional accounts of gesture has grown, several semi-conventionalized gestures have been identified as conveying various pragmatic meanings in interaction (Kendon 2005). These semi-conventionalized gestures fall on a continuum between conventionalized emblems and spontaneous co-speech gestures in that they have relatively stable hand shapes yet spontaneously emerge with speech. One such gesture, the ‘ring’ (index and thumb held together), has been shown to function pragmatically to mark key points in Italian and German spoken discourse (Kendon 2005, Neumann 2004). Using academic presentation data from 131 speakers in English, I show that the ring gesture functions similarly when it occurs in these data, and moreover that it occurs far more frequently in the presentations of more experienced speakers, suggesting that it is part of an acquired sociolinguistic style. Such possible sociolinguistic patterns have been virtually unexplored in gesture studies.

Previous work by this presenter, based on academic presentations by 17 experienced native English speakers, corroborated Kendon’s and Neumann’s findings that the ring gesture is used in conjunction with speech in two related ways: as an ‘iconic’ gesture related to precise, small objects, and as a ‘pragmatic’ gesture to mark precise or key points in the discourse. The present paper includes additional data from academic presentations given by 40 native English-speaking presenters with little or no public speaking experience, and from academic presentations in English given by 74 largely inexperienced non-native presenters (representing 20 nationalities). Instances of co-speech uses of the ring gesture were identified and counted. Results show that while 15 out of 17 of the experienced native presenters used the ring gesture more than once (and often many times) to emphasize key points, only 8 out of 40 of the inexperienced native presenters, and only 8 out of 74 non-native presenters, used the ring gesture at all, even when other spontaneous gestures were frequently used. When these two latter groups did use the ring gesture, it was more often iconic than pragmatic in function.

Although second language processes are likely to be an important influence on the use of gesture in the non-native presentations, the relative absence of the ring gesture among inexperienced native presenters suggests that this gesture may be part of an acquired register or style that is adopted by more experienced speakers. In this way, the ring gesture might be comparable to spoken sociolinguistic features, such as prosodic forms, which do not carry semantic meaning but do exhibit variation according to context and social identity. Indeed, the ring gesture’s function to emphasize selected points may allow it to indirectly index a social ‘stance’ (Ochs 1993) of authority on a given topic, especially when used frequently and prominently. This study has implications for considering potentially socially-motivated variation in gesture use within as well as across language communities.

References

- Ochs, E. (1993). Constructing Social Identity: a Language Socialization Perspective. *Research on Language and Social Interaction* 26(3), 287–306.
- Kendon, A. (2005). *Gesture: Visible action as utterance*. Cambridge: Cambridge University Press.
- Neumann, R. (2004). The Conventionalization of the Ring Gesture in German discourse. In C. Müller & R. Posner (eds.) *The semantics and pragmatics of everyday gestures. Proceedings of the Berlin conference, April 1998* (217–224) Berlin: Weidler.

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Gesture use and L2 proficiency in story recall: A case study

This longitudinal case study examines whether and how the gestures accompanying speech (henceforth ‘gestures’) made by one adult second language (L2) learner change as his proficiency progresses over a period of five years. Research has shown that speakers make relatively more gestures in their L2 than in their L1 in story recall (e.g., Gullberg, 1998; Sherman & Nicoladis, 2004; Yoshioka, 2005). Furthermore, speakers produce more deictic gestures in L2 than in L1 at both intermediate (Gullberg, 1998) and advanced levels (Sherman & Nicoladis, 2004). On the other hand, the situation is less clear with respect to the use of iconic gestures. Intermediate Swedish learners of French and French learners of Swedish produce fewer iconic gestures in L2 than in L1 (Gullberg, 1998). However, intermediate Chinese learners of English produce more iconic gestures in L2 than in L1 (Nicoladis, Pika, Yin, & Marentette, 2007). Then again, advanced Spanish speakers of English and English speakers of Spanish produce iconic gestures at the same frequency in their L1 and L2 (Sherman & Nicoladis, 2004). Based on these different research findings, Nicoladis et al. (2007) suggest that the effect of proficiency on the production of iconic gestures in L2 is mediated by task complexity.

The present study uses a longitudinal approach to investigate the possible effect of proficiency on gestures. By keeping other factors such as a source-target language combinations and task constant, this approach is considered most suited for the objective of the study. The research question addressed is whether change in proficiency in L2 is reflected in the quantitative and qualitative aspects of gestures. The data used in the study were collected from a Dutch learner of Japanese who told the same story three times: after six months of learning Japanese, after one year and after five years. His proficiency level of Japanese increased from very beginning, intermediate to low advanced over these years.

The results reveal that an increase in the level of proficiency is not only reflected in speech but also in gestures. For instance, increasing proficiency was reflected both in the total number of gestures and in the number of iconic and deictic gestures. However, the increase in the number of iconic gestures was more distinct than that of deictic gestures. Thus, unlike previously suggested (Sherman et al., 2007), the present results reveal that the increase of proficiency does affect the production of iconic gestures. Changes were also observed in the number of gesture per clause. Interestingly, the changes showed a reverse-U-curve developmental pattern with the intermediate, not the beginning, stage of learning L2 showing the highest number of gesture production per clause. Furthermore, as proficiency progresses, the speaker’s descriptions of the same scene become visually detailed (i.e. with the use of iconic gestures). The results will be discussed in terms of the effect of proficiency and the characteristics of the target language on gesture production in L2 and of their possible implications for the study of gestures in general.

References

- Gullberg, M. (1998). *Gesture as a communication strategy in second language discourse: A study of learners of French and Swedish*. Lund: Lund University.
- Nicoladis, E., Pika, s., Yin, H. & Marentete, P. (2007). Geture use in story recall by Chinese-English bilinguals. *Applied Psycholinguistics*, 28, 721–735.
- Sherman, J. & Nicolaidis, E. (2004). Gestures by advanced Spanish-English second-language learners. *Gesture*, 4 (2), 143–156.
- Yoshioka, K. (2005). Linguistic and gestural introduction and tracking of referents in L1 and L2 discourse. Groningen dissertation in linguistics 55, Groningen: Groningen University.

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Talking during films: Differing treatments of absent and gestural responses by first speaker

Conversation anaexlytic research has shown that a gap after a first pair part can signal that a dispreferred second pair part is forthcoming (Pomerantz 1984) and that a silence can be attributed to a particular interlocutor, i.e. that the turn is relevantly absent and that the absent turn belongs to them (Schegloff 2007).

In a collection of television/film generated talk and assessments, from 15 hours of video recordings of interactions among friends and romantic couples watching television or films, we have found through conversation analysis that interlocutors use events depicted on television and in film to initiate topics and to produce assessments of what they have seen or heard. However, we have found that the responses to first pair parts can be delayed, minimal, or absent. Yet these instances do not necessarily result in a pursuit of the course of action. Despite the lack of pursuit, the first speaker's subsequent talk can have very different characteristics depending on the response received (or lack thereof).

This poster demonstrates the differences in how absent responses and gestural responses are treated by the first speaker in a dyad whilst watching a film together. The participants are a romantic couple in which one pursues topics throughout the film and the other generally produces either no response or a gestural response. Neither participant treats the lack of uptake or the gestural responses as problematic, although the first speaker's subsequent talk differs in cases of absent and gestural responses.

References

- Pomerantz, A. (1984). Agreeing and disagreeing with assessments: some features of preferred/dispreferred turn shapes. In: J. M. Atkinson, & J. Heritage (eds.) *Structures of Social Action: Studies in Conversation*, 57–101. Cambridge: Cambridge University Press.
- Schegloff, E. A. (2007). *Sequence organization in interaction: A primer in conversation analysis I*. Cambridge: Cambridge University Press.

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Mimetics as gesture in Taiwan Sign Language

Mimetics represent physical sensations and impressions and it is divided into two categories: sound mimetics and manner mimetics. While sound mimetics refer to the sound produced by an entity or event, manner mimetics refer to perceptual events in different sensory modalities but not necessarily involve sound (Kita 1997).

Sound mimetics has been observed in American Sign Language (Bridges 2007) and Italian Sign Language (Fontana 2008) and these two studies refer to this linguistic phenomenon in terms of onomatopoeia. Onomatopoeia is manifested in mouth actions which involve various configurations of the jaw, lips, cheeks, tongue and air emission in both sign languages. To exemplify, while signing the utterance 'PEOPLE WHO MARCH IN A PARADE' in Italian Sign Language, the mouth would simultaneously produce [pa-pa-pa] to indicate the sound of the rhythmic marching movements (Fontana 2008: 108).

This study aims to show that the facts of sound mimetics and manner mimetics are evidenced by mouth actions in Taiwan Sign Language. The preliminary results are based on the spontaneous signing data and story-telling data from six signers. There are three illustrative examples of sound mimetics: [hu], [pa] and [po]. [Hu] is produced with signs, such as AIRPANE and FAN, to show the sound produced by an engine-driven machine; [pa] is produced to mean two entities bump together such as a car bumps into another car; [po] is used to indicate something is broken. Regarding manner mimetics, three examples are [puffed cheeks], [continuous air stream from the mouth], and [pu]. [Puffed cheeks] co-occurs with signs CROWD INTO or FAT referring to a large amount or size; [continuous air stream from the mouth] co-occurs with signs, TYPHOON and AUTUMN, indicating a blowing wind; [pu] is used to indicate a swift jump, for instance, a frog jump out of a container.

Those mouth actions mentioned above is suggested as mimetics because those mouth actions give vivid image of an event or state just like Japanese mimetics do, in the spirit of Kita (1997). Unlike Japanese mimetics, TSL mimetics is treated as gesture due to the following three reasons. First, mimetics are optional during signing but when they are produced, they must co-occur with manual signs. Second, the meaning of mimetics depends on context: [pa] could be either sound mimetic (e.g. two entities hit together) or manner mimetic (e.g. something disappear). The meaning which [pa] conveyed is specified by the corresponding manual signs. Third, there is variability: both [pa] and [po] are used to indicate something is broken.

The present preliminary proposal will further be refined by observing more signers. Working on mimetics not only helps to understand the functions of TSL mouth actions and but also how gesture is manifested in sign language.

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An investigation of preschool children's learning of symbolic gestures to represent objects

From as early as 10 months of age, children begin to use gestures with increasing regularity. At around a year of age a child can symbolically represent an object or scene of interest by using their hands (for example flapping their hands to represent a bird) (Acredolo & Goodwyn, 1988). These gestures are symbolic because the hands or arms are used to represent a semantic feature of an object or scene. Children appear to use symbolic gestures to represent aspects of an object of interest to them, but it is unclear how they infer which properties of the object to represent in the gestural medium (i.e. how they acquire the gesture). One possibility is that use of symbolic gestures is learned in a similar vein to conventional (or emblem) gestures (McNeill, 1998), through exposure via social interaction to the form of gesture that carries a particular meaning. For example, whilst English-speaking adults use the index finger to represent the number one, Germans use the thumb (Pika, Nicoladis, & Marentette, 2009). There is a small amount of evidence that children may learn symbolic gestures in this way, through interactive routines with an adult (Acredolo & Goodwyn, 1988). However, an alternative possibility to the social learning account is that children select which aspect of an object to represent through gesture based on their own inferences about the object reflecting its salient physical features or movement.

To test these two accounts, forty 3-year-olds, ranging between 42 and 45 months of age, were shown four novel objects accompanied by a gesture that highlighted either a visual feature of the object or the movement feature of the object. For each object the gesture was presented five times, with each presentation accompanied by an utterance that matched the gesture being demonstrated (for example if the gesture demonstrated the movement of the object, E said "look at how this toy moves"). Children were then asked to describe the object to their caregivers so that the caregivers could select the target object from an array including the target and four other distracter objects, that shared one of the following: (1) the visual feature that was previously demonstrated (or not depending on the condition), (2) the movement feature, that was again previously demonstrated or not, depending on the condition, (3) the colour or (4) the shape. We calculated the proportional use of the modelled gesture vs. some other gesture for each child. We found, contrary to the social learning hypothesis, that children tended to use gestures that had not previously been demonstrated to them to describe the object to their caregivers. This suggests that children do not infer how to represent an object symbolically through learning from a more capable peer. Instead, we suggest, children are able to infer the features of an object on their own, and are capable of transferring this inference into a symbolic representation through their hands.

References

- Acredolo, L. and Goodwyn, S. (1988). 'Symbolic gesturing in young infants', *Child Development*, 59(2), 450–466.
McNeill, D. (1998). Speech and gesture integration. In J. M. Iverson, & S. Goldin-Meadow (eds.), *The nature and functions of gesture in children's communication*. San Francisco: Jossey-Blass.
Pika, S., Nicoladis, E. and Marentette, P. (2009). 'How to Order a Beer Cultural Differences in the Use of Conventional Gestures for Numbers', *Journal of Cross-Cultural Psychology*, 40(1), 70–80.

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Patterns of handedness for communicative gestures in human children

Both neuroanatomical and behavioural studies have shown that gestures and speech entertain close relations during human ontogeny (e.g., Bates & Dick, 2002). Researchers have also highlighted the importance of communicative gestures in the development of symbolic representation and the emergence of language (e.g., Rowe & Goldin-Meadow, 2009).

Moreover, given the cerebral lateralization of speech in humans, the investigation of manual laterality for communicative gestures can provide further evidence of these speech-gestures links. The production of communicative gestures, especially pointing gestures, has been reported to be lateralized to the left cerebral hemisphere. In the context of early language development, this right hand bias has been observed for induced pointing gestures in experimental contexts (e.g., Vauclair & Cochet, submitted), as well as for spontaneous gestures in naturalistic settings (e.g., Cochet & Vauclair, submitted, a). Interestingly, the right-sided bias for pointing gestures was found to be stronger than for manipulative actions, whether it concerned hand use in simple reaching or in bimanual activities (Bates, O'Connell, Vaid, Sledge, & Oakes, 1986; Vauclair & Imbault, 2009). Hand preference for communicative gestures then appears to be independent of handedness for manipulative actions. This has led researchers to postulate the existence of a specific communication system in the left cerebral hemisphere, controlling both gestural and vocal communication, and which may differ from the system involved in purely motor activities. Besides, different patterns of laterality between communicative gestures and non communicative actions have also been observed in nonhuman primates (in baboons: Meguerditchian & Vauclair, 2009; and in chimpanzees: Hopkins, Russel, Freeman, Buehler, Reynolds, & Schapiro, 2005). Altogether, these results strongly support the gestural theory of the origin of speech (Corballis, 2009).

When distinguishing between different functions of pointing gestures (e.g., Tomasello, Carpenter, & Liszkowski, 2007), we observed that the difference in the degree of manual preference between manipulative actions and pointing gestures was the strongest for informative pointing (Cochet & Vauclair, submitted, b), a gesture which aims at helping the adult by providing him/her needed information. This result highlights the need to focus on the function of pointing gestures, in addition to their handedness.

By presenting a number of arguments, including original data of our own, we thus aim to demonstrate the relevance of studying the development of hand preference for communicative gestures, in order to better understand the nature of the speech-gestures links.

References

- Bates, E., O'Connell, B., Vaid, J., Sledge, P. and Oakes, L. (1986). *Developmental Neuropsychology*, 2, 1–15.
Bates, E. and Dick, F. (2002). *Developmental Psychobiology*, 40, 293–310.
Cochet, H. and Vauclair, J. (a). (submitted). 'Features of spontaneous pointing gestures in toddlers.'
Cochet, H. and Vauclair, J. (b). (submitted). 'Pointing gestures produced by toddlers from 15 to 30 months: Different functions, handshapes and laterality patterns.'
Corballis, M. C. (2009). *Brain & Language*.
Hopkins, W. D., Russel, J., Freeman, H., Buehler, N., Reynolds, E. and Schapiro, S. J. (2005). *Psychological Science*, 6, 487–493.
Meguerditchian, A. and Vauclair, J. (2009). *Brain and Language*, 108, 167–174.
Rowe, M. L. and Goldin-Meadow, S. (2009). *Developmental Science*, 12, 182–187.
Tomasello, M., Carpenter, M. and Liszkowski, U. (2007). *Child Development*, 78, 705–722.
Vauclair, J. and Cochet, H. (submitted). Laterality for pointing and language development in toddlers.
Vauclair, J. and Imbault, J. (2009). *Developmental Science*, 12, 1060–1069.

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Free your feet – Free your mind: An analysis of spontaneous coverbal foot gestures

Foot gestures have been an afterthought, at best, in gesture research, because, generally, our feet are not readily available for use in communication. Anecdotally, we know that foot gestures can be deictic, however, the temporal and semantic correlation between speech and foot, hand, and head gestures has not been studied in a systematic fashion. It is well known that speech production and perception are correlated with cortical activation of the hand and orofacial motor areas, but recent research by Luizzi et al.'s (2008) found that the leg motor cortex is significantly more activated during speech production and perception than during non-linguistic tongue and mouth movements. These findings indicate that the feet may serve an integral role in embodied linguistic processes. The aim of this presentation will be to show that the feet can be utilized to create complex spontaneous coverbal gestures in coordination with the hands and head. Using McNeill's methodology (2005), I made a detailed analysis of the foot, head, and hand gestures of individuals who were sitting up on a table so that their feet could move about freely. The individuals either had both their hands and feet available for articulation or, alternatively, their hand movements were completely restricted while their feet were unrestrained. In virtually every utterance, the individuals' feet become rhythmically synchronized with speech prosody. In addition, their feet occasionally served a deictic function either in isolation or alongside deictic gestures of the hands or head. Most significantly, both feet, in unison, sometimes expressed complex iconic gestures. These multidimensional foot gestures were temporally and semantically synchronized with the head, hands, and speech. The frequency and complexity of foot gestures rose significantly when an individual's hand movements were restricted, but rhythmic, indexical, and iconic foot gestures still appeared when an individual's hands were free to move. The complex nature of coverbal foot gestures provides evidence for the idea that we are opportunistic gesturers who unwittingly recruit multiple body parts to embody meaning.

References

- Liuzzi, G., Ellger, T., Flöel, A., Breitenstein, C., Jansen, A. and Knecht, S. (2008). 'Walking the talk—Speech activates the leg motor cortex', *Neuropsychologia*, 46, 2824–2830.
- McNeill, D. (2005). *Gesture and thought*. Chicago: University of Chicago Press.

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Religious values and the nature of cognitive control during co-speech left-hand gestures produced by Bengali-speaking people: A study of left-hand gestural taboo

As far as the identity is concerned, gesture is considered an output of human cognitive process (McNeill, 1992) organized in the specific cortical region of brain, whereas religion is treated as a prime socio-spiritual factor developed over time. Arguably, these two non-identical phenomena exhibit completely two different socio-cultural functions e.g. performing non-verbal expression, and promoting spiritual as well as ritual activities respectively all over the world. But in Bangladesh — a country of South Asia where 85% of its total population is Muslim — religion has been influencing hand gestural activities of human beings for a long time, which controls significantly their cognitive aspects visualized in communicative process in many ways. As human beings all over the world maintain homologous hand structures, they are supposed to produce identical measurement of their hand gestures in terms of both temporal and spatial hand proportion with its three prototypical formation phases — rising and moving hand, the stroke and retraction (Kendon, 1980). But different ethno-cultural identities, as well as socio-regional diversities provide new light, dimension and shape of their hand gestures across culture all over the world. Mainly regional variants, and different social factors, as well as cultural artifacts determining socio-cultural uniqueness of a region motivate people to produce differential hand movements in gestural performance. Alongside, hand movement as 'nonverbal behavior' varies with class, culture, family or individual (Ekman and Friesen, 1969). In Addition, Posner (2002) indicates that gestures of humans are rarely based on innate movement patterns, rather on learnt ones.

In Bangladesh Islam — the prime religion of the country — brings different codes into force in society to be followed by the believers. Such religious codes eventually restrain their psychological states and cognitive domains, like hand gesture in multifarious ways. So, a hand gesture, especially the movement of the left hand is treated as rude behavior. Hence always they have to avoid the spontaneous cognitive incitement, especially hand gesture during speech due to the pressure of religious values and customs. According to the revealed law of Islam, movements of left hand during the activities of daily life, especially offering something to other people, exchanging greetings, and eating or feeding is discouraged seriously. Thus, people always tend to control their free left hand movement in the public space. Such a controlling attitude to left hand movements is started in the house by the parents from childhood. Children are specially taught not to use their left hand publically. Even if a child is identified as left handed earlier, s/he is forced by the family members to change the handedness from left to right. This process continues until achieving the expected outcome. Such an initiative taken by the family members to convert the handedness of children from left to right, and to control the use of free movement of their left hand can be termed as cognitive control. This paper examines the result of an experiment conducted on identifying the nature of the restricted use of left hand movement — a consequence of controlling cognitive aspects — of Bengali-speaking people emphasizing the following topics.

- Cognitive control by religious values
- Speakers internal motivations to control left hand movement
- Taboo neutralization
- Direction indication by left hand
- Reduced space and time during left hand movement

References

- Ekman, P. and Friesen, W. (1969). 'The Repertoire of Nonverbal Behavior: Categories, Origins, Usage, and Coding', *Semiotica*, 1, 49–98.
- Kendon, A. (1980). 'Some considerations for a theory of language origins', *Man*, 26, 199–221.
- McNeill, D. (1992). *Hand and Mind*. The University of Chicago Press.
- Posner, R. (2002). Everyday Gesture As a Result of Ritualization. In M. Rector, Poggi, I., Trigo, N. (eds.) *Gestures: Meaning and Use*. 217–230. Universidade Fernando Pessoa.

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Gesture during deception: The effect of cognitive load on gesture production

It is possible to reveal verbal deception through non-verbal behavior. The current consensus in deception research proposes three main factors are responsible for changes in behavior during deception – emotion, behavioral control, and cognitive load. These factors have been linked to a decrease in co-speech gestures in previous studies (Ekman 1974/1985; Vrij 1995; Mann et al. 2002). As stated, one proposed factor that might interfere with gesturing is cognitive load. However, gesture has long been connected to cognition in co-speech gesture research. An increase in gesturing during lexical access (Morrel-Samuels and Krauss 1992), solving math problems (Goldin-Meadow et al. 2001), and picture description (Melinger and Kita 2007) could be linked to an increased cognitive load. Furthermore, several theories in gesture research have also highlighted the link between cognition and gesture, such as Growth Point Theory (McNeill 1997), the Sketch Model (de Ruiter 2000), and the Information Packaging Hypothesis (Kita 2000). Therefore a possible conflict exists between the expectation of the rate of gesturing with cognitive load during truth-telling and deception. Thus two pilot experiments were developed to test the cognitive load during deception hypothesis.

The first experiment compared spontaneous and rehearsed lying, and all participants were placed in one of the two lying conditions, and were asked to give truthful responses afterward. Spontaneous liars were forced to lie immediately, while rehearsed liars were given ten minutes to prepare. The prompts for deception involved personal recollections of a non-emotional nature and were chosen to elicit description. If cognitive load leads to a decrease in co-speech gestures, then the spontaneous liars should have fewer gestures than those in the rehearsed condition, and both conditions should have fewer gestures than during the truthful condition. The results showed an increase in gesturing during the spontaneous condition between lying and truth-telling, while the number of gestures decreased during the rehearsed condition between lying and truth-telling, most probably due to rehearsal effects.

The second experiment, a modification of Franklin (2007), compares the number of co-speech gestures in a truthful condition to two levels of increased cognitive load. Using the Canary Row video, participants were instructed to retell certain scenes to a non-viewer. Those in the truthful condition reported the scenes accurately. Those in the weak increased cognitive load condition were asked to report the same scenes out of order. Those in the strong increase condition were asked to make changes to the scenes. The number of co-speech gestures in each condition was compared in order to see if an increase in cognitive load leads to a decrease in gesturing. Those in the truthful condition had the lowest number of gestures, and that gesturing increased as a result of cognitive load.

The results of this study do not support the hypothesis that an increased cognitive load during deception inhibits the rate of gesturing. It seems likely that gesture and cognition are connected, and the processes that are often lumped together under “cognitive load” might in fact lead to variations in gesture rates.

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The significance of the body in the pursuit of response in conversation

Conversational interaction is by nature a cooperative endeavour of conversational participants. If a speaker produces an action, his recipient(s) would be expected to provide a response to enable the flow of the conversation. This paper sets out to explore the role of speakers' body movements, especially postural shifts, in the pursuit of response, and how these body movements work with other semiotic resources in this process. We mainly focus on the body movements in two types of conversational activities, a prototypical response-soliciting question-answer sequences, and a less typical response-soliciting news delivery (Maynard, 1997) (or informing) sequences.

There have been mainly two streams of research that address this question. Conversation analysts (e.g. Pomerantz, 1984) account for the phenomenon from its sequential organization, while linguists concentrate on the linguistic features of the speaker's utterance. Stivers & Rossano (in press) try to integrate the two approaches and propose a unified and grading view in the pursuit of response. Although Stivers & Rossano (in press) mention the importance of gaze in addition to other linguistic resources, other parts of the body remain untouched.

The current paper adopts the theory of CA, interactional linguistics, and multimodal analysis to investigate the role of the whole body in soliciting response in question-answer and news delivery sequences. Based on the microanalysis of 6-hour Mandarin Chinese conversational data, some observations are made. First, the question-answer sequences further fall into three categories according to the specific actions performed; they are, request for information, topic initiation, and offers. The speaker tends to move the torso, head and sometimes also hand forward towards the recipient while asking the question as topic initiation (see Fig.1). He holds the forward projecting body until the response, i.e. the answer, is provided, and also probably a new topic is initiated. The forward projecting body movements are not frequently seen in other two types of actions performed by questions. In the announcement of the good or bad news in news delivery sequences, the speaker usually moves his head and torso forward, and performs a stroke of the gesticulation at the prominent syllable which is usually the "newsworthy" word with certain valence in the announcement (see Fig.2). However, instead of holding the projecting body, the speaker would immediately retract his torso and hand backwards to the rest position at the termination of his announcement sequence. This forward projection and backward retraction of the body are often followed by an immediate response from the recipient.

Based on the analysis, it is argued that body movements are of significance in soliciting response in certain questions and assertions. This observation is actually not at variance with Schefflen's (1964, 1973) study on postural shifts in communicational structures. This study tries to connect the postural shifts of the body to the sequential units and specific actions carried out. It is hoped that this study could contribute to our understanding of the role of the body in the demarcation of sequential units and the formulation of actions in conversation.

References

- Maynard, D. (1997). 'The News Delivery Sequence: Bad news and good news in conversational interaction', *Research on Language and Social Interaction*, 30(2), 93–130.
- Pomerantz, A. (1984). Pursuing a Response. In: J.M. Atkinson, & J. Heritage, (eds.), *Structures of Social Action*, 152–164. Cambridge, Cambridge University Press.
- Schefflen, A. (1964). 'The Significance of Posture in Communication Systems', *Psychiatry*, 27(4), 316–331.
- Schefflen, A. (1973). *Communicational Structure: Analysis of psychotherapy transaction*. Bloomington: Indiana University Press.
- Stivers, T. and Rossano, F. (in press). *Mobilizing Response*. *Research on Language and Social Interaction*.



Fig.1 Body movements in question-answer sequence



Fig.2 Body movements in news delivery sequence

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Introducing the affective priming paradigm to explore configurational versus analytic facial processing on Down syndrome

Persons with Down syndrome (DS) are typified by a deficit to recognize negative facial information. Only a minor set of studies have examined face processing in DS, and these have mostly examined emotion recognition through explicit or controlled measures (e.g. Morales, Lopez & Hedlefs, in press; Wishart, Cebula, Willis & Pitcairn, 2007; Wishart & Pitcairn, 2000; Pitcairn & Wishart, 2000; Turk & Cornish, 1998). In this paper, the main concern was to explore automatic appraisal processing for emotional facial recognition. Specifically, young persons with and without DS were required to participate in a set of affective priming studies in order to explore their automatic appraisal mechanisms on emotional faces. A first affective priming study required both groups to categorize in each experimental trial an emotional or neutral target face that was preceded by another emotional face. Stimuli presentation for each facial set (one face after another) was conducted by using an SOA of 300 milliseconds and the ISI set up to 50 milliseconds. In a second experiment with similar experimental settings was conducted. However, an experimental condition was introduced to present emotional faces upside-down to compare reaction times to normal orientation in order to test for configurational versus analytic facial processing. Results to the first experiment showed that most of the participants with DS (not all of them) have automatic recognition difficulties on negative facial stimuli; this is according to empirical evidence obtained in early studies (Morales & Lopez, 2006). The second experiment results aims to a configurational processing style on emotional facial recognition for the experimental as well as the control group. This is so since the affective priming effect was destroyed or diminished in both groups due to facial downward orientation regarding the nature of the prime (positive, negative and neutral). These results are congruent with studies reporting holistic processing in adults (see Shimamura, Ross & Bennett, 2006). This contribution is special since as far as we know there are no academic reports on this peculiar kind of DS face recognition appraisal mechanisms.

References

- Morales, M. G. E., López, R. E. O. and Hedlefs, A. M. I. (in press). *La psicología de las emociones: expresión facial, emoción y pensamiento [Psychology of emotions: facial expression, emotion, and thought]*. Mexico: Trillas
- Morales, M. G. E. and López, R. E.O. (2006). *El síndrome de Down y su mundo emocional [The emotional world and Down syndrome]*. Mexico: Trillas.
- Pitcairn, T. K. and Wishart, J. G. (2000). Face processing in children with Down syndrome. In: D. Weeks, R. Chua, and D. Elliot (eds.), *Perceptual-Motor behavior in Down syndrome*, 123–147. Champaign, Ill: Human Kinetics.
- Shimamura, A., Ross J.G. and Bennett, H. D. (2006). 'Memory for facial expressions: the power of a smile.' *Psychonomic Bulletin & Review*, 13(2), 217–222.
- Turk, J. and Cornish, K. (1998). 'Face recognition and emotion perception in boys with fragile X syndrome.' *Journal of Intellectual Disability Research*, 42, 490–499.
- Wishart, J. G. and Pitcairn, T. K. (2000). 'Recognition of identity and expression in faces by children with Down syndrome.' *American Journal on Mental Retardation*, 105(6), 466–479.
- Wishart, J. G., Cebula, K. R., Willis, D. S. and Pitcairn, T. K. (2007). 'Understanding of facial expressions of emotion by children with intellectual disabilities of differing aetiology.' *Journal of Intellectual Disability Research*, 51(7), 551–563.

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Brief training with co-speech gestures lends a hand to verb learning in a foreign language

How do gestures help people learn foreign words? One recent study has shown that speech accompanied with gestures can help people learn and remember words in a foreign language. In Kelly, McDevitt and Esch's (2008) study, participants learned more Japanese verbs when the instructor defined them while making congruent symbolic gestures than when the instructor presented incongruent gestures or only speech. In Study 1, we replicated Kelly et al.'s (2008) study and examined whether the presentation of congruent symbolic gestures during instruction would help English monolingual adults learn Cantonese nouns and verbs. In contrast with Kelly et al.'s (2008) study, we found no difference between the number of Cantonese words learned in both congruent-gesture and word-only conditions. We found that participants recalled and recognized significantly more verbs and fewer nouns when they were in the congruent-gesture condition than in the word-only condition. Our findings suggest that congruent gestures may carry symbolic information for action words, which may lead to a verb bias (more verbs learned over nouns). Why would symbolic gestures lead listeners to a verb bias? Perhaps symbolic gestures convey congruent symbolic information and movement simultaneously to aid the communication of verbs to listeners. In Study 2, we investigate this possibility through systematic manipulation of symbolic information and movement variables in three conditions: (1) non-moving symbolic information (e.g. a picture of someone sitting), (2) moving symbolic information (e.g. an animated cartoon of someone eating) and (3) non-moving non-symbolic information (i.e. speech only) (4) moving and non-symbolic information (i.e. beat gestures).

We predict that the additive and interaction effects of symbolic information and movement will lead to a verb bias. If this were the case, then we would expect to find a verb bias in the moving symbolic information condition, but not in the non-moving symbolic information and non-moving non-symbolic information condition. Alternatively, if it is the non-moving symbolic information that facilitates this learning, then participants presented with still cartoons will show a verb bias.

The initial results showed that there was a significant difference on the percentage and the numbers of verbs participants learned in the gesture condition relative to the word condition, the still picture condition and the beat condition. In addition, there was no significant difference between the gesture and the animated cartoon condition.

These results suggest that gestures make people attend to foreign language words as verbs because of the simultaneous presentation of moving and symbolic information in a different modality. The findings from our study could have implications for teaching and learning foreign languages in classroom contexts.

References

- Kelly, S. D., McDevitt, T. and Esch, M. (2008). 'Brief training with co-speech gesture lends a hand to word learning in a foreign language', *Language and Cognitive Processing*, 24(2), 313–334.

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Clarifying the relationship between iconic gesture production and working memory among bilingual and monolingual children

There is a great deal of individual variability in how frequently speakers gesture. A number of variables may contribute to that variability (see, for example, Hostetter & Hopkins, 2002). In the present study, we focus on the posited role of iconic gestures in facilitating speech production by utilizing working memory (Krauss, 2004). Working memory refers to the memory system that stores and sustains information temporarily (Baddeley, 2003). By keeping spatial representations in working memory, gestures may facilitate speech production by continually activating prelinguistic sensorimotor features (conceptual representations) of the intended words (Krauss, 2004). Presumably, individuals with higher iconic gesture rates may have greater working memory capacities.

Working memory is a limited capacity system, therefore, knowing more than one language may influence gesture production. Bilinguals are generally more proficient in one language than the other (Mayberry, 2000). The weaker a bilingual's proficiency, the greater the demand on working memory in a speech production task (Ardila, 2003). Accessing words or linguistic constructions from the weaker language may lead bilinguals to gesture more frequently than monolinguals and this may help them to formulate their speech (Nicoladis, 2007, 2009).

This research aims to clarify the relationship between iconic gesture production and working memory among bilingual and monolingual children in a storytelling task. Examining this relationship among children is of interest since constructing narratives is a particularly difficult task for them (McCabe, 1991). We predicted that 1) bilinguals would gesture more than monolinguals, 2) there would be a negative correlation between word types (an indirect measure of proficiency) and gesture rate, and 3) that higher speech rates (an indirect measure of working memory capacity) would be associated with greater gesture rates. We included two groups of bilinguals, to allow for a test of generalizability of the results.

French-English (FE) bilingual (N=21), Chinese-English (CE) bilingual (N=8), and English (E) monolingual (N=13) children were included in this study. The FE bilingual children were nearly equally proficient in both languages, whereas the CE bilingual children were more proficient in English.

Participants watched cartoons and were asked to retell the stories. Their stories were videotaped and transcribed. Gestures were coded and the gesture rate was calculated for each participant. Speech rate was calculated as a measure of working memory.

Our preliminary findings show that the FE and E groups gesture at similar rates, whereas the CE group has a much lower gesture rate and that there was no correlation between proficiency and gesture rate. These findings counter our hypothesis that bilinguals would have higher gesture rates than monolinguals. This finding further suggests that cultural or linguistic norms might be more important in predicting gesture rate than proficiency in a language. Our findings also indicate a robust relation between speech rate and iconic gesture production wherein participants with high speech rates seem to produce a higher rate of iconic gestures than those with low speech rates. This trend is consistent across both bilingual and monolingual groups of participants and seems to be independent of language proficiency. This finding suggests that the greater the working memory capacity, the more likely speakers are to use gestures. We discuss this finding in terms of the role of working memory in facilitating speech production (cf. Krauss, 2004).

References

- Ardila, A. (2003). 'Language representation and working memory with bilinguals', *Journal of Communication Disorders*, 36, 233–240.
- Baddeley, A. (2003). 'Working memory: Looking back and looking forward', *Nature Reviews: Neuroscience*, 4, 829–839.
- Hostetter, A. B. and Hopkins, W. D. (2002). 'The effect of thought structure on the production of lexical movements', *Brain and Language*, 82, 22–29.
- Krauss, R.M. and Morsella, E. (2004). 'The role of gestures in spatial working memory and speech', *The American Journal of Psychology*, 117(3), 411–424.
- Mayberry, R.I. and Nicoladis, E. (2000). 'Gesture reflects language development: Evidence from bilingual children', *Current Directions in Psychological Science*, 9, (6), 192–197.
- McCabe, A. and Peterson, C. (1991). *Developing Narrative Structure*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Nicoladis, E. (2007). 'The effect of bilingualism on the use of manual gestures', *Applied Psycholinguistics*, 28, 441–454.
- Nicoladis, E., Pika, S. and Marentette, P. (2009). 'Do French-English bilingual children gesture more than monolingual children?', *Journal of Psycholinguistic Research*, 38(6), 573–585.

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Gesture and hierarchy in orchestral rehearsal

This paper examines the relationship between the gestures performed by members of a professional orchestra, including the conductor, and the organizational hierarchy seen within the orchestral rehearsal. This paper argues that musicians use their gestural practice, specifically in terms of the size and height of gesture is directly relational to the individual's place, at the time of the gesture, to negotiate and enact their positions within the orchestral hierarchy.

Orchestral hierarchy can be observed as an externally imposed structure; seen, for example, in the seating arrangements of an ensemble where desks of string players closer to the conductor are higher ranked than players further away and 'outside' players (players who, within a pair of string players sharing a stand or 'desk', are closer to the audience) are higher than 'inside players' (cf. Del Mar 1981).

This study uses data from a corpus of twenty-two hours of footage, filmed using four digital cameras, of a professional orchestra (comprised of eighty-two musicians) working with a professional conductor rehearsing a work for performance collected as part of an ongoing project examining musician interaction.

The gestural analysis focuses on manual gestures including actions where musicians are interacting with cultural artifacts (such as pencils, instruments, batons) with their hands. The size of a gesture was defined as the amount of space 'taken-up' by the gesture; both in terms of space traveled through by the entire gesture as well as the distance that the gesture occurs from the gesturer's own body. The height of a gesture was defined as the distance off the ground the stroke of the gesture is made (cf. McNeill 1992). The gestures were analysed using ELAN. The results show that individuals' gestures are both larger and higher when the individual is positioned higher in the hierarchy than when they are positioned lower in the hierarchy. This is shown to be both as a result of functional requirements (higher members of the hierarchy's gestures co-occur more often with the need to communicate with large groups which requires their gestures to be visible over distance) as well as part of a complex system of social interactions within the rehearsal.

This paper argues that orchestral hierarchy is neither fixed nor static. It shows, through analysis of gestures which do not follow the overall pattern described above, that the orchestral hierarchy is both fluid and dynamic; that the hierarchy can subtly change, most importantly in relation to the music being rehearsed. As individual lines within the music become more important so do the position(s) of the player(s) of those lines. This change will be shown as being both reflected in and to a certain extent managed by a change in gestural practice.

Thus, this paper concludes that the relationship between gesture and the changing hierarchy within the orchestra is reflexive; the interactants and their gestures are shaped by their position in the hierarchy but the musicians also manipulate their own gestures as an important part of establishing, challenging and managing roles and identities within the orchestral hierarchy.

References

- Del Mar, N. (1981). *Anatomy of the orchestra*. London: Faber & Faber.
McNeill, D. (1992). *Hand and mind*. Chicago: The University of Chicago Press.

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ACTMAP: A corpus tool for the multimodal analysis of popular music

In the music video for the Hall and Oates song Portable Radio, John Oates sings the line "Now turn it soft and low" while performing three notable gestures. With the phrase "soft and low," he first gestures with his right hand as if turning the volume dial of a radio. Then holding this gesture, he dips his body down and away from the microphone in an iconic dance move. Simultaneously, with an exaggerated gaze into the camera, Oates also gestures vocally. He draws the word "low" into two distinct syllables, dropping his voice nine semitones to sing the final "oh." It is this salient second syllable that is synchronized with the downward dip.

These moments of Oates' musical performance offer a striking example of multimodal expression, incorporating elements of language, gesture, prosody, and embodied metaphor. Moreover, Portable Radio is not especially unique; similarly rich examples abound in popular music videos. Thus our goal was to build a tool to facilitate the analysis of such musical performances by making use of lyrics and audio and video recordings available on the internet. To this end, we developed ACTMAP, a lyrics corpus and web interface for use in the multimodal analysis of popular music. This paper describes the development and functionality of ACTMAP and presents the preliminary findings of a study on the lyrics "high" and "low."

When complete, the corpus will consist of lyrics to over 200,000 songs (currently 75,000), subject to an array of search functions. Lyrics meeting search criteria are presented alongside an automatically embedded YouTube video showing a recorded performance of the song (if one is available). Songs are presented one-by-one in a conveniently scrollable vertical field, allowing quick identification and analysis of relevant results. A checkbox feature allows songs to be tagged and compiled into lists for later analysis.

In conjunction with ACTMAP's development, a study is underway to examine how the spatial words "high" and "low" tend to occur with patterns of vocal melody and other performance-related gestures, including interest to how the spatial meanings are extended metaphorically across modalities. Preliminary analysis identified a random sample of 35 songs for each word (multiple hundreds remain) and measured the word's sung melodic contour. Results show that overall the word "low" is sung lower and with a greater drop in pitch than "high," a pattern that is exaggerated in the context of metaphorical usage (e.g., emotion). Though intuitive, this finding is remarkable in consideration of the strophic quality of most popular music, wherein the same melody is repeated with different lyrics in each stanza. We suggest that results such as these have important implications for how we understand the role of modality and metaphor in communication.

This pilot study also serves to illustrate how ACTMAP enables an impressively large-scale examination of multimodal patterns in popular music. We anticipate that the tool will be of use, not just to gesture researchers, but to linguists, sociologists, musicologists, and indeed anyone interested in the intersections of language, gesture, music, dance, and meaning.

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Speech/hand coordination in the production of prosodic focus for different gesture types

Introduction– Manual gestures are naturally produced in spoken communication. Most studies qualitatively showed that brachio-manual gestures and speech are tightly bound. Some studies (Levelt et al., 1985; de Ruiter, 1998; Rochet-Capellan et al., 2008) analyzed the coordination of speech and manual gestures using motion capture and combined speech/pointing tasks using either noun phrases or non-words. They found effects of gesture on speech production, effects of speech stress location on gesture and relationships between pointing and articulation. Studies on gesture/speech coordination usually focused on only one type of gesture at a time (deictics or iconics). The aim of this study is to analyze the coordination between speech and different manual gestures in the production of prosodic contrastive focus. Focus consists in emphasizing (in a sense, pointing at) a word or phrase within an utterance. It is thus related to manual pointing. This study addresses two main issues: the influence of focus position and the role of gesture type on gesture/speech coordination.

Methodology– We studied four gesture conditions: no gesture (speech only) vs. index-finger pointing (deictic communicative) vs. beat gesture (non-deictic communicative) vs. control gesture (button press; non-deictic non-communicative); and two prosodic focus conditions: subject vs. object focus. A correction task was used to elicit the production of focus. Participants sat in a chair facing a screen (display of visual targets). We recorded their vocal productions (microphone) and the motion of their mouth and right hand (motion capture). Points of interest were annotated for gestures (beginning, apex, return, end) as well as for articulatory lip targets (protrusion and aperture peaks) and for acoustic cues (fundamental frequency and intensity peaks, syllable boundaries). Ten adults participated in the experiment.

Results– We found a significant effect of focus condition on the timing of gesture production. The timing of the acoustic cues of focus did not vary significantly when a gesture was produced or for the different gesture types, except for intensity. The timing of the gestures' points of interest was compared to that of the articulatory targets and acoustic cues for testing potential alignment. The pointing gesture was more strictly coordinated with focus than the other gestures. In particular, the pointing gesture apex was tightly aligned with articulatory lip targets corresponding to vocalic gestures. Control and beat gestures appeared to be either more difficult to elicit or less precise. Speech/gesture coordination was different across gesture types. Moreover the data show that speech onset time was influenced by the production of a gesture but that the utterance's temporal internal organization was not. Gesture onset time was always influenced by the focus condition. However, the gesture's temporal internal organization was influenced by the focus condition only for pointing.

Conclusion– This study allows for a more precise characterization of speech/gesture coordination in spoken communication (entire sentences, dialog context and motion capture). It also shows that speech/gesture coordination is dependent on the functional relationship between gesture and speech (differences between gesture types). For pointing, there seems to be a tight coordination between pointing apex and articulatory targets.

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A call for conformity: Defining gesture in human and non-human primates

Human language is traditionally described as communication by word of mouth and one of the most intriguing questions about language concerns how it came to be the province of the oral modality. Many researchers, over the centuries, have proffered that language evolved from a gestural modality (e.g. Arbib et al., 2008). The comparative approach aids to untangling this question by investigating similarities and differences between human communication and the communication systems of other animal species, especially non-human primates. However, cross-species comparisons are problematic due to inherent biases in the methodological approach, the study species and the use of different gesture definitions. The purpose of this paper is to compare the uses and definitions of the term gesture in studies of human and non-human primate communication and to present a comprehensive definition to be used on future studies. Research on human gestural communication covers a wide range of topics including pre-linguistic gestures, co-speech gestures and signs (Bates et al., 1979; McNeill, 1992; Peng, 1978). Of the non-human primate studies, research has been focused on gestural interactions between conspecifics in captivity and the wild and communicative interactions with humans in a laboratory setting (Gardner and Gardner, 1969; Goodall, 1986; Pika et al., 2005). Topics range from gestural abilities in natural settings to testing understanding of the meaning of specific types of gestures, such as pointing (Leavens et al., 2008). However, research has been concentrated disproportionately on the great apes, particularly the chimpanzee, with less attention paid to the smaller apes and monkeys (Tomasello and Call, 2007). Lack of research attention directed to New World monkeys and prosimians leaves these groups without further discussion.

In this paper, we create a model through which gesture types can be described and categorized, regardless of what species is being studied. To enable accurate comparisons, we combined models from human gestures and animal behavior. We used McNeill's (1992) 'Gesture Continuum' – an arrangement of gesture forms according to their dependence on any accompanying speech as well as their inherent language properties – and Tinbergen's (1963) 'Four Questions' – of which, as applied to behavior, explain immediate and evolutionary mechanisms of such behavior. By combining these two models to explain gesture use, we create a four dimensional framework which may highlight morphological and phylogenetic constraints that may, in turn, explain certain discrepancies between species or genera without necessarily questioning their cognitive capacities.

References

- Arbib, M.A., Liebal, K. and Pika, S. (2008). 'Primate vocalization, gesture and the evolution of human language', *Current Anthropology*, 49, 1053–1076.
- Bates, E., Benigni, L., Bretherton, I., Camaioni, L. and Volterra, V. (1979). *The Emergence of Symbols: Cognition and Communication in Infancy*. New York: Academic Press.
- Gardner, R. A. and B. Gardner. (1969). 'Teaching sign language to a chimpanzee', *Science*, 165, 664–672.
- Goodall, J. (1986). *The chimpanzees of Gombe, Patterns of Behaviour*. Cambridge: The Belknap Press of Harvard University Press.
- Leavens, D., Hopkins, W. D. and Bard, K. A. (2008). The heterochronic origins of explicit reference. In: J. Zlatev, T. Racine, C. Sinha, & E. Itkonen (eds.) *The shared mind*, 187–214. Amsterdam: John Benjamins Publishing.
- McNeill, D. (1992). *Hand and Mind*. Chicago: The University of Chicago Press.
- Peng, F. C. C. (1978). *Sign language and language acquisition in man and ape*. Boulder, CO: Westview.
- Pika, S., Liebal, K., Call, J. and Tomasello, M. (2005). 'The gestural communication of apes', *Gesture*, 5, 41–56.
- Tinbergen, N. (1963). 'On aims and methods of ethology', *Zeitschrift für Tierpsychologie*, 20, 410–433.
- Tomasello, M. and Call, J. (2007). *The gestural communication of monkeys and apes*. Mahwah, NY: Lawrence Erlbaum Associates.

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Categorical perception of handling handshapes in British Sign Language (BSL)

Sign languages contain forms referring to the way objects can be handled or manipulated, 'handling' classifiers (analysis of handling forms as classifiers is poorly understood; for simplicity here I will use the term 'handshape'). The size and shape of the referent differs continuously, so the signer's hand describing the handling of it can also be gradiently varied (e.g. to indicate different degrees of thickness of a book). The aim of the study is to establish whether the continuous information is perceived categorically by deaf native BSL signers and hearing non-signers.

Supalla (1982) argued that classifiers in American Sign Language (ASL) are solely composed of morphemes. A finite set of morphemes can be assumed in the case of entity classifiers because the handshapes do not vary gradiently. However, Zeshan (2003) pointed out that handling forms in a relatively young sign language such as Indo-Pakistani Sign Language (IPSL) combine handshape and movement and seem to be improvised and gestural in nature. Liddell (2003) suggested that classifiers contain blends of both linguistic and gestural elements. This study aims to reveal if there is a closed class of listable handling morphemes or whether handling handshapes in BSL are non-listable and more gestural (gradient) in nature.

Categorical perception (CP) is a psychophysical phenomenon in which certain stimuli are perceived as discontinuous variations despite a continuous change in form (Liberman et al., 1967). CP is defined by increased discrimination performance at the category boundary. In sign language literature, CP has been reported for phonemic handshape contrasts in ASL (Emmorey et al., 2003; Baker et al., 2005), for ASL Size and Shape Specifiers (Emmorey & Herzig, 2003) or for affective and linguistic facial expressions (McCullough & Emmorey, 2008). These studies confirmed that CP for handshapes is mediated by linguistic experience. No study to date has investigated CP for handling handshapes.

The present study measured CP using identification and discrimination (ABX) experimental paradigms. The stimuli were short video clips and comprised of 11 handshapes varying in finger aperture discretely in equal steps along two continua. The continua endpoints were BSL handshapes used to describe handling of a) cylindrical objects (jars); and b) flat objects (books).

Data from 9 deaf BSL signers and 10 hearing non-signers revealed that both groups displayed a peak in discrimination accuracy around the category boundary. In addition, signers were more accurate in discrimination across both types of stimuli than non-signers. In summary, CP was observed for both handshape continua and for both groups.

Similar performance across groups suggests that CP for handling handshapes may not be mediated by sign language knowledge. CP effect can be observed for familiar, but non-linguistic stimuli, e.g. colour (Roberson, Davies, & Davidoff 2000) or facial expressions (Campbell et al. 1997). Handling handshapes may be part of canonical, non-linguistic display, familiarised through handling actions performed every day and thus organised into perceptual, rather than linguistic categories. This study lends support to the argument that signs depicting handling in BSL may contain a blend of linguistic and gestural components.

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Iconic gestures prime words

Gesture and speech are tightly integrated temporally, semantically, and pragmatically despite various linguistic and structural differences between gestures and speech. This study further explored the integrated link between gestures and language by examining the interplay between gestures and the lexical processing system. Among different types of gestures, we focused on iconic gestures since they express meaning that is related to the semantic content of the accompanying speech. We aimed to examine whether the presentation of an iconic gesture (e.g., a two-hands flapping gesture) would activate a semantically related word (e.g., "bird" or "flying"). In order to address this issue, we adopted a cross-modal semantic priming paradigm, with the aim of testing the hypothesis that gestures prime semantically-related words.

In order to select the iconic gestures that conveyed meaningful semantic information for this study, a group of forty-five English-speaking undergraduates were presented with 80 silent videotaped gestures in a speechless context. Then they were asked to write a single word that best described the meaning of a gesture. Forty iconic gestures which had meanings that were agreed upon by at least 70% of the participants were chosen to serve as gesture primes in our study. The gesture primes were paired with the lexical targets that contained both words and non-words. In terms of words, we used the gesture meanings derived from the participants and matched the meaning with the words listed in free association norms (Nelson, McEvoy, and Schreiber, 1998). The non-words were matched to the semantically-related words from the with respect to (1) word length, (2) number of orthographic neighbors and (3) number of syllables.

In our study, sixty-five participants were presented with 10 semantically-related and 10 semantically-unrelated gesture-word pairs, and 20 gesture-non-words pairs. They were instructed to make a lexical decision on the keyboard as quickly and accurately as possible. We expected the participants would respond to words preceded by semantically-related gestures faster and more accurately than words preceded by semantically-unrelated gestures. Our findings supported this hypothesis. Participants responded faster in the semantically-related condition ($M=641$ ms, $SD=143$ ms) as compared to the unrelated condition ($M=670$ ms, $SD=179$ ms), $t(57)=2.16$, $p=.035$. In addition, their lexical decision was more accurate in the semantically-related condition (.7% error rate) as compared to the semantically-unrelated condition (3.8% error rate), $t(39)=3.56$, $p=.001$.

Our results suggest that there is a semantic link between iconic gestures and semantically-related words, such that mere exposure to iconic gestures facilitates the recognition of semantically related words. It implies that our semantic network is composed of both words and gestures. When one learns the meaning of a word, he/she also associates the word with an iconic gesture that directly resembles the physical properties and movement of objects or actions being described in that word. Once the association between iconic gestures and words is established, the presentation of the iconic gesture would activate the semantically related words.

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Gestures facilitate memory recall of object features

Several theories have suggested that gestures facilitate memory recall (e.g., Lexical Retrieval Hypothesis (Rauscher, Krauss & Chen, 1996) and the Image Activation Hypothesis (de Ruiter, 1995). This study examines the role of gestures in recall of spatial details. Specifically, we investigated the effect of representational gestures (iconic gestures, and abstract deictic gestures) on both the numbers and types of object features recalled in speech.

Twenty adults participated in this study. They were shown two different videos containing various furniture items (e.g. sofas and coffee tables) in two conditions (baseline vs. induced-gesture). Each video contained twenty furniture items and was presented twice. The two videos were counterbalanced across both conditions. They were then instructed to remember the furniture in the room and the locations of the furniture. The duration of each of the two videos was 25 seconds. In the baseline condition, the participants were simply instructed to recall the items and their locations. In the induced-gesture condition, the participants were prompted to use gestures as they recalled the items. Their speech was transcribed and the gestures that co-occurred with speech were coded. We analyzed the number of furniture items and corresponding features (particularly shape, size, quantity and spatial location) recalled in both speech and gestures. We focused on the following item features conveyed in speech and gestures.

The results showed the participants did not recall significantly more items in the induced-gesture condition than in the baseline condition. However, they recalled significantly more furniture features in the induced-gesture condition than in the baseline condition, $t(19)=2.84$, $p=.01$ and more unique furniture features (such as the shape and location of furniture items) in the induced-gesture condition as compared to baseline, $t(19)=2.56$, $p=.03$. Interestingly, in both conditions, the participants depicted different types of features in their speech and gestures – furniture shape in gesture but quantity and size in speech, suggesting gesture-speech mismatches (see Figure 1).

These results show that an increased amount of gestures helped participants to retrieve item features, suggesting that gestures aid the speaker in the process of spatial recall, especially for information about target items. These results also indicate that different types of information are conveyed in gesture as compared to speech. Speakers seem to favor the gesture modality, in comparison to speech, for conveying spatial information.

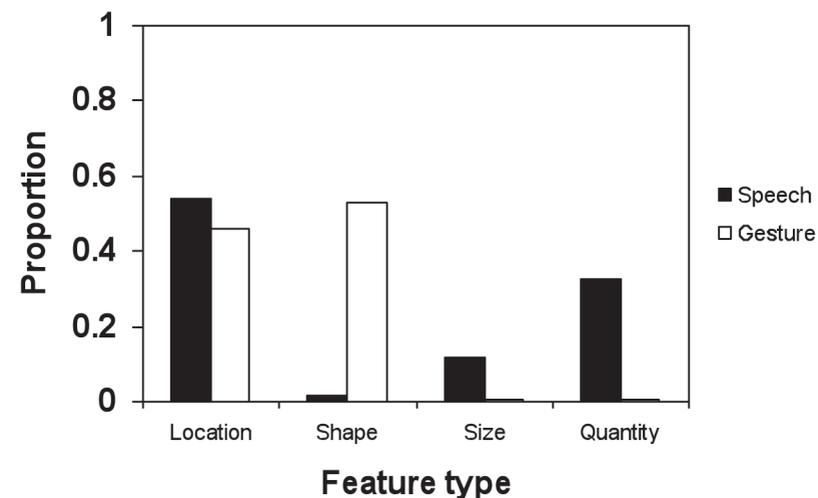
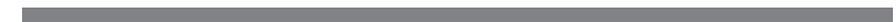


Figure 1. Distribution of types of furniture features expressed in speech and gesture in both conditions.



poster talks



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Interaction between language and gesture meaning systems in a lexical decision task

Gesture is a powerful communication tool like language, as both of them convey meaning. While language has been widely studied, gestures have not yet received due attention. Recent research has shown that gesture is not to be conceived of only as a communication device subordinate to the production and comprehension of language. Instead, gesture has been acknowledged to help modulate cognition, conveying meanings that can complement those conveyed by language.

The Information Packaging Hypothesis by Kita (2000) distinguished between analytic thinking that conveys verbal information, which is segmented and linear, and spatio-motoric thinking that conveys visuo-spatial information, which is holistic in character. In this view, people can benefit from both these two types of information in conveying and comprehending complex meanings in everyday communicative settings.

Aim of the present study was to assess the interaction between the gesture and language meaning systems when the verbalization of the gesture meaning is prevented. In fact, the facilitating effect of gesture on message understanding could be simply due to a covert verbalization of its meaning, i.e. to a priming effect between the covertly verbalized meaning of gestures and the meaning of words. Instead, if the Information Packaging Hypothesis holds, the visuo-spatial information conveyed by gesture should prime the same meaning word even when the gesture cannot be verbalized. Accordingly, the hypothesis of the present study was that with a lexical decision task, which does not imply explicit words' meaning recovery, the gesture and language meaning systems should interact when the verbalization of the gesture meaning is ruled out.

By means of a priming paradigm, we asked forty participants to make a lexical decision task. The participants were presented with forty video-clips of iconic gestures followed either by target words, which could be related or not in meaning to the priming gestures, or by target non-words. The meaning of half of the forty gestures referred to objects (20 nouns), while the other half referred to actions (20 verbs). Participants had to count aloud during the presentation of the prime gesture, thus preventing the verbalization of its meaning, and then to decide if the following target was a word or a legal non-word in Italian. Response times were recorded. The results showed shorter response times when the meaning of iconic gestures and that of words were the same than when their meanings differed.

These results support the hypothesized interaction between the gesture meaning system, conveying visuo-spatial and motoric meaning features and the language meaning system, conveying propositional information, as claimed by Kita (2000).

Reference

Kita, S. (2000). How representational gestures help speaking. In D. McNeill (Ed.), *Language and gesture*. (pp. 162–185). Cambridge: Cambridge University Press.

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Metaphoric gestures used in music classrooms

In Conceptual Metaphor Theory (CMT, Lakoff & Johnson, 1980), metaphor is an underlying conceptualization which is realized by linguistic metaphorical expressions and other manifestations such as gestures. It therefore is claimed to reflect and structure thinking. However, the de-contextualization aspect of CMT is opposed by applied linguistic researchers who insist on the importance of how language is used and presented in context, though they do not totally discard the concept of conceptual metaphor. They claim that metaphor has to be investigated along with its surrounding words and the context in order to be understood.

Gesture, or gesticulation in Kendon's (1988) terminology, being more dependent on language and carrying fewer properties of a language than emblems or sign languages, has been claimed to be another mode via which conceptual metaphor can be manifested. It has been suggested by empirical studies that gestures may provide supplementary, though not independent, evidence of how conceptual metaphor works.

Empirical studies suggest that gestures and metaphors can be effective educational tools in various fields at different school levels, and metaphor can be manifested by both gestures and metaphorical expressions, including in music education. On the other hand, gestural studies conducted in mathematics, English, and music classrooms have shown the frequent co-presentation of gestures with speech, and teachers use them either purposely as a pedagogical tool or spontaneously with other verbal and nonverbal instructions to transfer knowledge to the students. However, most studies conducted in classrooms consider gestures and metaphors separately. It is rare that they show the roles a conceptual metaphor plays in classroom instruction.

By analyzing music sessions at secondary level in Taiwan, where Mandarin Chinese is the official and most commonly used language, the present study examined if any verbal and gestural metaphors were used together as part of instructional sequences. The main aims of this talk are: (a) to have a better understanding of what and how metaphoric gestures, along with speech, are used by music teachers to assist teaching, and (b) to develop an identification procedure for identifying metaphorically used gestures in classroom discourse.

Multiple data sources (different sessions and schools), a variety of research methods (mainly classroom observation and after-session semistructured interviews), and member checks (transcribing the observed sessions and interviews, and coding the metaphor) were used in the study to establish the trustworthiness. In addition, ELAN was used as an annotation tool to help transcribe and analyze data.

At least five educational implications have been found: (a) gestures have been observed as an aspect of one teacher's pedagogical repertoire in music teaching in a Mandarin Chinese speaking context, (b) various pedagogic functions appear to be served by the gestures used, including emphasizing important words and making contrasts, (c) metaphors have been observed, both in speaking and in gesture, (d) pedagogic functions of the metaphoric gestures include labeling new ideas and linking the unfamiliar to the familiar, and (e) multimodal metaphors used by teachers can not only benefit the students but also confuse them. Further studies based on bigger samples are needed before further conclusions are reached.

References

Kendon, A. (1988). How gestures can become like words. In F. Poyatos (Ed.), *Cross-cultural perspectives in non-verbal communication* (pp. 131–141). Toronto: Hogrefe.
Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago and London: The University of Chicago Press.

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One form – one meaning: Humboldt's Principle of semiotic differentiation in the gestural communication of humans and apes

Young apes use a wider variety of synonymous communicative gestures than adult animals do (Pika and Liebal, 2006). This flexible connection between signal and function results in a large number of gestures denoting similar meanings, in particular in the context of "play". In a study on juvenile gorillas, Pika et al. (2003) found that 73% of all gorilla gestures were used in more than one context and that all species-typical gestures were observed in the play context of youngsters. Once the apes reach adulthood, gesture use in general decreases and gestures may be assigned a new function, such as the "throwback head" gesture in gibbons which comes to signify different semantic content in adult animals (Liebal et al., 2004).

Linguistic research on humans has revealed a similar trend with young children applying gestures in a more versatile way than adults (e.g. deictic gestures, see Tellier, 2009, and representational gestures, see Cohen and Borsoi, 1996). This synonymous use of gestures gradually becomes more differentiated as the infants advance towards more adult-like gesture use. The process of overgeneralizing semantic properties and thereby creating synonyms is known as "semantic overextension" and decreases with time as a more differentiated use of linguistic items arises. The splitting of overextensions (synonyms) clears the path for the acquisition of more lucid and differentiated communicative means in children.

Underlying the process of differentiation of synonymous linguistic items is the so-called "Humboldt Principle" which rules that during language development, tendencies toward more clarity and therefore against ambiguity become stronger and eventually split semantically synonymous words into items with different semiotic contents. Real synonyms rarely remain in language. The principle can provide a framework for the investigation of gestural differentiation during subadulthood in apes and humans.

From a divergent point of view, the accumulation of synonyms may reach a threshold level and trigger communicative mechanisms to react against the ambiguity or else communication becomes too indistinct. An alternative explanation may be that the addition of functional contexts in adulthood (e.g. sexual encounters) exerts force on the gestural repertoire to split synonyms and adapt signs for the new contextual situations.

Humboldt's Principle can give insights into evolutionary dynamics behind aspects of primate communication. It shows us that communication aims at lucidity and accuracy in expression and possesses intrinsic mechanisms that prevent obscurity or vagueness. The question remains whether semiotic differentiation during primate gesture development is a matter of convergent or divergent linguistic processes.

My paper reviews current literature on the gestural repertoire of young apes and children and focusses on developmental aspects of gesture use in terms of semantic differentiation.

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Iconic gestures aid memory in five-year-old children

Abundant research has shown that adults can memorize more information when they encode the information with gestures (Woodall and Folger, 1981, 1985; Church, Garber, and Rogalski, 2007; Cook and Tanenhaus, 2009). Tellier (2008) recently found that gestures also help five-year-old children to memorize foreign words. In her study, one group of the children was taught the words with semantically-related gestures and asked to enact those gestures. Another group was taught the words with pictures. Both groups of children learnt foreign words for four weeks. The findings showed that the gesture-group children memorized more words than the picture-group.

However, there were three issues remain unaddressed. First, do gestures help younger children to encode words given that these children might have difficulty in integrating information conveyed in visual and auditory modalities? Second, does mere exposure of gestures (i.e., without enactment of gestures) facilitate encoding of words on the spot? Third, do free-form gestures (gestures that do not carry semantic meanings, such as speech beats) aid memory as well? Our study aimed to address these issues by examining the role of gestures (semantically-related vs. gestures without semantic meaning) in encoding and memorizing words in four- and five-year-old children.

Thirty-one native English-speaking children (sixteen 4-year olds and fifteen 5-year olds) were involved in the experiment. Each child was tested individually in three conditions. In each condition, the children were presented with a list of seven words (animals, occupations, or home furniture) produced by a native English speaker. Each word was presented once only and there was a two-second interval between words. In the no-gesture condition, the speaker solely pronounced the words. In the free-form-gesture condition, the speaker made circular hand movements for each accompanying word. In the semantically-related-gesture condition, the speaker produced iconic gestures for each accompanying word (e.g., two hands flapping as referring to a bird). The three conditions were counterbalanced. After presentation of each list of words, the children were asked to recall them in a free order. In order to prevent them from gesturing during recall, each child was given a stuffed toy to hold to keep their hands occupied.

Figure 1 shows the performance of four- and five-year-old children in all three conditions. Repeated measures ANOVA showed that there was a significant effect of age: $F(1,29)=13.23$, $p<0.001$, a significant effect of condition, $F(2,58)=3.40$, $p=.03$, and a significant interaction effect, $F(2,58)=3.78$, $p=.02$. In general, the five-year-old children performed significantly better than the four-year-old children across all three conditions. However, unlike the four-year-old children, the five-year-old children memorized more words that were presented with gestures, particularly the semantically-related gestures. Bonferroni-adjusted pairwise comparisons showed significant difference between no-gesture condition and semantically-related-gesture condition, $p=.004$, but no significant difference between no-gesture condition and free-form-gesture condition, $p=ns$.

The findings showed that mere presentation of semantically-related gestures accompanying with words facilitated encoding and storage of words. However, such effect was only found in the five-year-old children. It raises the possibility that there is age difference in integrating information presented in visual and auditory modalities.

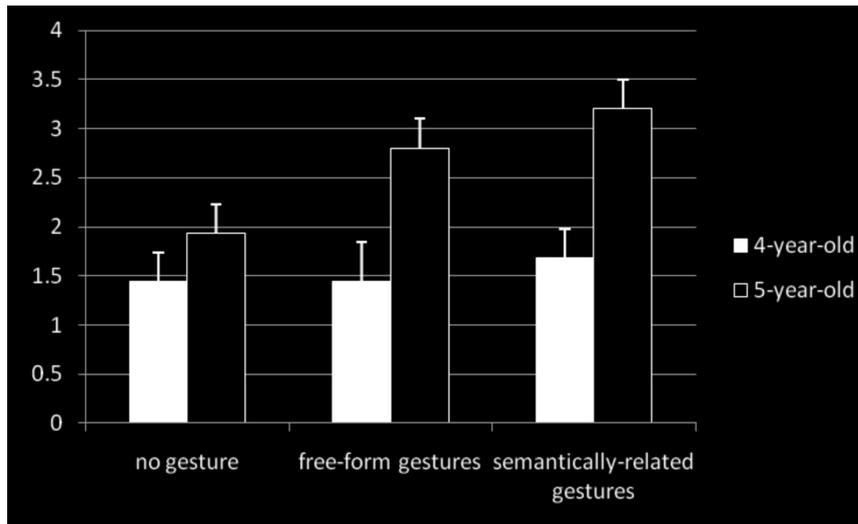


Figure 1. Mean number of words recalled by the four- (black bars) and five-year-old children (white bars) in three conditions.

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Gesture and argumentation in political communication: A semiotic inquiry

The dialogue between gesture studies and semiotics can be acknowledged in two main authors like Kendon and McNeill, even if it is often limited in the search for a typology of gesture signs. Recent research in semiotics, nevertheless, is touching certain topics whose relevance for gesture studies has not yet been evaluated. Three main aspects of this renewed research are i) the elaboration of a semantic of processes of categorisation that are graduated, continuous (see *Tension et signification*, by Zilberberg and Fontanille, 1998); ii) the proposition of a complex theory of body as semiotic figure (*Sema & Soma* by Fontanille, 2004); iii) the development of a theory and consequent analysis of practices, that create a clear distinction between texts as closed configurations and practices where the activity of configuring is taken into account (*Pratiques Semiotiques*, by Fontanille, 2009, *Vissuti di significazione* by Basso, 2008).

In my communication, I try to argue for the heuristic contribution of a semiotic interpretation of the neglected relationship between gesture and argumentation in practices of communication (debating the works of Bull, Calbris and Streeck). For this occasion I will present the result of a detailed analysis of a corpus of Italian political TV transmissions where the different contribution of gestures styles for different politicians is considered.

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Evolution of communication and the gestural origin of language. An interdisciplinary master module

Evolution and the gestural origin of language constitute an important actual field of research in linguistics as well as in biology. Sign language research has recently significantly contributed to this field. Behavioral biology increasingly is coming to the conclusion that animal communication has linguistic traits. The interdisciplinary bringing together of these two areas has a high potential for clarifying the issue of the evolution of communication. At the same time this connection highlights the constructed character of scientific research which can hinder interdisciplinary exchange and provokes questions about basic assumptions.

Our innovative interdisciplinary master module seeks to contribute to the clarification of these issues and to give the students the opportunity of participating in interdisciplinary research.

The theoretical background and basics are examined in an one-hour lecture and a two-hour seminar. During a supervised research period students will collect data on acoustic and gestural communication in animals and humans. During this research part of the module students will cooperate in interdisciplinary groups. The focus will be on hearing and deaf people communicating through gestures and on linguistic aspects of parrot communication.

The module started in winter semester 2009/2010, the research period will cover one month (January 2010), and the data will be presented at the conference in July along with an evaluation of the teaching and learning experience.

References

- Armstrong, David/Wilcox, Sherman (2003): Origins of Sign Languages, in: *Oxford Handbook of Deaf Studies, Language, and Education*. Oxford etc., 305–318
- Corbey, Raymond (2005): *The metaphysics of apes. Negotiating the animal-human boundary*. Cambridge etc.
- Hauser, Marc D./Chomsky, Noam/Fitch, W. Tecumseh (2002): The faculty of language: What is it, who has it, and how did it evolve?, in: *Science* 298, 1569–1579
- Rendall, Drew/Owren, Michael/Ryan, Michael (2009): What do animal signals mean?, in: *Animal behaviour* 78, 233–240
- Zuberbühler, Klaus (2009): Survivor signals: The biology and psychology of animal alarm calling, in: *Advances in the Study of Behavior* 40, 277–322

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Students reflect their level of understanding through non-verbal backchanneling

Backchanneling cues provided by a listener can inform a speaker whether his message is successfully communicated. Non-verbal backchanneling cues are often considered part of motor mimicry or interaction synchrony (e.g., Bavelas, Black, Chovil, Lemery, & Mullett, 1988). In the classroom setting, most research has focused on the role of teachers' gestures that accompany speaking (e.g., Goldin-Meadow, Kim, & Singer, 1999). When naturalistic learner gestures have been examined, the focus has typically been on active exchanges between conversation partners (e.g., Gullberg, 2006; Stam & McCafferty, 2008). We know of only one previous study examining learners' gestures when they were passive listeners (Abbasi, Dailey, Afzulpurkar, & Uno, 2008), which found a significant relationship between particular self-adapters and affective/cognitive state (e.g., head scratch indicated recalling information).

Our study, in addition to examining gestures of learners in a passive listener role, was performed in a typical classroom setting. We also focused on a wider variety of gestures, including head and hand movements, as well as self-adapters. To affect cognitive state, we manipulated the difficulty of material participants were learning (easy vs. difficult). We predicted that head and hand movements would increase for easier material, due to more idle and unfocused activity. In contrast, self-adapters were predicted to increase for difficult material, due to a greater level of discomfort (Heaven & McBrayer, 2000) accompanying less understanding of the material.

The 15 participants were students in a psychology research methods course. Videotaped in their regular classroom, they first read a short study description followed by the teacher lecturing for 4 minutes to explain the description. Class discussion for 5 minutes followed. This cycle was repeated (easy, difficult, easy, difficult). Lastly, participants completed a questionnaire assessing their perceived difficulty of the class material. The two easy descriptions were perceived as significantly easier than the difficult ones.

The authors coded the gestures from videotape, with a physical description and assignment to one category: head movement (e.g., nodding head), single hand activity (e.g., drumming fingers on desk), or self-adapter (e.g., scratching face with fingers). Reliability was 86% for gesture occurrence and 98% for classification. We excluded gestures occurring when a student was talking, as well as instrumental hand activity (e.g., writing, texting).

We calculated the proportion of each gesture type for each description and then averaged the two easy descriptions for the easy condition, and likewise for the difficult (there were no effects of description order). In the easy condition, hand activity and head movements were more prevalent; self-adapters were numerically fewer, but the difference was not significant. Linear regression analyses using perceived difficulty from the questionnaire as a predictor of gesture type proportions corroborated the effect for hand activity and head movements.

Our results show that even when learners are in a more passive listener role, the kinds of gesturing they produce in the classroom can be informative. Since the head and hand movements of several students would be relatively easy to perceive peripherally at once, they may be useful for teachers as a source of information about students' level of understanding.

References

- Delvaux V., Huet K., Piccaluga M., & Harmegnies B. (2008). Perceptually driven VOT lengthening in initial stops by French-L1 English L2-learners. *Proc. of the 8th International Seminar on Speech Production*, Strasbourg, 149–152.
- Delvaux, V. & Soquet, A. (2007). The influence of ambient speech on adult speech productions through uninten-

tional imitation. *Phonetica*, 64, 145–173.

Clairret, S. (2008). Une étude aérodynamique de la nasalité vocale en français méridional, *Actes des 27 ièmes JEP*, Avignon, 297–300.

Wattbled, J. P. (1995). Segmental and suprasegmental structure in southern french, in C. Smith et M. Maiden (eds) *Linguistic Theory and the Romance Languages*, Current Issues in Linguistic Theory 122, 181–200.

Bradlow, A., Pisoni, D., Akahane-Yamada, R., & Tohkura, Y. (1997). Training Japanese listeners to identify English /r/ and /l/: IV. Some effects of perceptual learning on speech production, *JASA*, 101, 2299–2310.

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For you or for me? Speakers gesture for both speaker-oriented and listener-oriented reasons

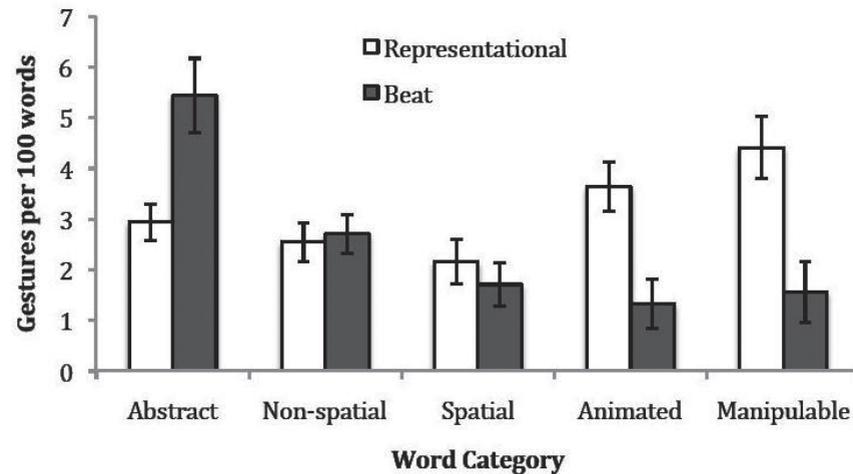
Two types of speech-accompanying gestures are commonly recognized: representational and beat (McNeill, 1992). Theories about the origins of representational gestures have typically focused on either listener-oriented (e.g., gestures are produced to help the listener understand) or speaker-oriented (e.g., gestures are produced as result of the speaker's own cognitive state) factors (e.g., Kendon, 2004). Although these two types of theories are often pitted against one another, they may not be mutually exclusive. However, because few studies have attempted to examine both listener-oriented and speaker-oriented factors within the same paradigm, it remains unclear whether they operate independently or whether they interact to affect representational gesture rates. This is investigated in the present study.

Further, while much research has examined the factors that influence representational gesture rates, little research has investigated the origins of beat gestures. Most studies that examine beat rates at all find them unaffected by manipulations such as visibility that do affect representational rates (e.g., Alibali, Heath, & Myers, 2001). However, the majority of these studies were designed to test hypotheses about representational gestures, and as a result, they largely employ tasks that elicit speech about primarily spatial and motor topics. Such topics do not necessarily elicit a high rate of beat gestures (e.g., Feyereisen & Havard, 1999). To understand more about the origin of beat gestures and the factors that affect their production, the present study will examine the gestures that accompany speech about a wider range of topics.

Sixty speakers described 30 nouns that represented 5 categories (abstract (e.g., circumstance), non-spatial concrete (e.g., vinegar), spatial (e.g., rectangle), animated (e.g., propeller), and manipulable (e.g., pliers)) that varied in terms of how strongly they are associated with spatial and motoric characteristics. The speakers described half of the words from each category while face-to-face with their listener and the other half with visibility blocked by a wooden screen. It was predicted that both word category and visibility would independently affect representational gesture rates. It was also predicted that more beat gestures would occur with abstract and non-spatial descriptions than with the other descriptions.

The analysis of representational gesture rates demonstrated the predicted linear trend across the five word categories, $F(1, 59) = 16.74$, $p < .001$, and the predicted effect of visibility, $F(1, 59) = 25.61$, $p < .001$. There was no interaction. Further, beat gesture rates also showed a linear trend across the five word categories, $F(1, 59) = 38.41$, $p < .001$, but in the opposite direction from the trend in representational rates (see Figure 1). There was also an interaction between word category and visibility for beat gesture rates; speakers produced more beats when their listener could see them, but only when describing abstract words, $F(4, 236) = 3.43$, $p = .02$. These results suggest that speaker-oriented and listener-oriented factors may influence representational gesture rates independently of one another, while beat gesture rates are affected by the interaction of the two.

Figure 1



References

- Alibali, M. W., Heath, D. C., & Myers, H. J. (2001). Effects of visibility between speaker and listener on gesture production. *Journal of Memory and Language*, 44, 169–188.
- Feyereisen, P., & Havard, I. (1999). Mental imagery and production of hand gestures while speaking in younger and older adults. *Journal of Nonverbal Behavior*, 23, 153–171.
- Kendon, A. (2004). *Gesture: Visible action as utterance*. Cambridge: Cambridge University Press.
- McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago: University of Chicago Press.

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The Chinese sign languages in Chinese society under globalization

Chinese people normally will be comparatively uncomfortable to be expressive using the gesture compared with their foreign counterparts. Because of the traditional Chinese culture in which some strict norms for regulating people's behaviors, the accepted practice for Chinese to be self-esteem without too much gesture in public. Otherwise, it tends to regard those who are very expressive with their bodies as uncivilized groups. As a result, people in China are forced to be quiet and obedient to their authority. However, on the other hand, China has a long history with the sign language, which can be dated back to the 14th century. From the very beginning, the sign language was implemented by the limited numbers of communities in China. Expressionless on one's face used to be considered as elegance. As time goes by, especially China was opened to the rest of the world three decades ago, more liberated young Chinese are radically bold enough to get rid of the rigid tradition. Instead, some of the created sign languages in China have been born accordingly in the modern time. This paper tries to address the following issues as far as the sign language is concerned.

1. How much influence is still there prevailing people's communication with body language such as gesture in China?
2. The comparative study with the implications of body language lodged by Westerns and Chinese;
3. The potential stereotype caused by the body language can be avoided by smart non-verbal communication;
4. As globalization thrives, people in China tend to be more expressive either in their body language or in their culture; which brings about more changes in the native language;
5. What significance will be achieved through body language without partiality;
6. Can tolerance be a precondition for accepting body language in the dominance of verbal communicative society? How does it solve the conflict risen by the misunderstanding in various cultures?

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Linguistic and embodied design of offers and requests in everyday interaction

The paper discusses two distinct but related actions that concern the transfer of an object or service – offers and requests. That is, it examines the linguistic and embodied design of the following conversational turns: 1) the speaker offers assistance or (the use of) an object to a recipient and 2) the speaker requests for assistance or an object from a recipient. The paper starts out from the most common linguistic forms of the two actions in the database, i.e. offers of the type do you want X and requests of the type can you X. The paper considers how embodiment, especially gestures but also gaze, body posture etc., differs in these two types of action. The analyses focus on the speaker's hands in relation to the object or service offered / requested.

The presentation relies on methods used in conversation analysis and multimodal interaction analysis, recognizing that actions are situated in complex social-interactive and material settings (e.g. Goodwin 2000). Previous research within conversation analysis has focused on the linguistic structures that are used for doing offers and requests (e.g. Curl 2006, Curl & Drew 2008; Heinemann 2006); the current study complements these findings with observations about the employment of other semiotic resources.

The data are drawn from audio-video recordings of casual face-to-face and in-car conversations from the Oulu Video Corpus of English and material in the research projects Talk & Drive and Habitable Cars.

References

- Curl, Traci (2006). Offers of assistance: Constraints on syntactic design. *Journal of Pragmatics* 38, 1257–1280.
Curl, Traci & Paul Drew (2008). Contingency and action: A comparison of two forms of requesting. *Research on Language and Social Interaction* 41(2), 129–153.
Goodwin, Charles (2000). Action and embodiment within situated human interaction. *Journal of Pragmatics* 32(10), 1489–1522.
Heinemann, Trine (2006). 'Will you or can't you?': Displaying entitlement in interrogative requests. *Journal of Pragmatics* 38(7), 1081–1104.

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The effects of using gestures for vocabulary learning in SLA

Although acquisition of vocabulary is an essential part of second language learning, learners are often left to themselves to find a way to memorize words, and tend to employ a familiar method, perhaps not the most efficient one. By exploring the possibility of using gesture as a memorization technique, one may be able to find a more effortless and efficient way for second language learning.

Gesture has been suggested to facilitate word retrieval by activating kinetic image in the mental lexicon (Krauss & Hader, 1999). Further, in second language learning, gesture has also been found to help learners to memorize foreign words. When learners were presented with a novel word accompanied by a gesture or when they were asked to repeat the gesture by themselves, learners showed greater accuracy in retrieving the target words (Kelly et al., 2009; Tellier, 2008). This suggests that gesture as both visual and motor modality facilitates memorization by creating richer trace in memory for the target words.

Present study tested the effect of enacting various bodily movements on memorization. An experiment was conducted on 116 Japanese college students, whose task was to remember 20 advanced level English words. In Speech-Only Condition, the participants repeated target words four times, each followed by Japanese translation. In other conditions, participants accompanied their speech with 1) Congruent Gesture, 2) Incongruent Gesture, 3) Beat Gesture, or 4) Instrumental Action. While gesture and word matched in Congruent Gesture Condition (i.e., thrusting of an arm while saying 'stab'), they did not in Incongruent Gesture Condition. In Beat Gesture Condition, an arm was moved forward as if emphasizing a word. In Instrumental Action Condition, a movement similar to Beat Gesture but only non-linguistic was used, that is, to move a game controller stick forward. The purpose of including Instrumental Action along with other conditions was to see if it was the semantic component of gesture and not simply the usage of bodily action that assists word learning. Participants' memory was tested five minutes, one week, and one month later.

Results showed that participants in Congruent Gesture condition remembered more words than those in Speech-Only Condition and all the other conditions. This suggests that enacting of a gesture which was co-expressive with the target words had a positive effect on learning. Moreover, although the accuracy rate was not as high as that of the Incongruent Gesture condition, it was also found that participants scored higher if they accompanied their speech with beat gesture but not the instrumental action, showing that it is the semantic component of gesture and not the usage of any bodily movements that benefits ESL learners.

References

- Kelly, Spencer D., Tara McDevitt, and Megan Esch (2009). Brief training with co-speech gesture lends a hand to word learning in a foreign language. *Language and Cognitive Processes*, 24 (2): 313–334.
Krauss, Robert M. & Uri Hadar (1999). The role of speech-related arm/hand gestures in word retrieval. In Lynn S. Messing & Ruth Campbell (eds.), *Gesture, speech, and sign*, (pp. 93–116). Oxford: Oxford Univ. Press.
Tellier, Marion (2008). The effect of gestures on second language memorization by young children. *Gesture* 8(2): 219–235.

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Nouns and verbs in Russian Sign Language: Economy and iconicity

Purpose of research. The aim of this work is to analyze phonologically similar nouns and verbs in Russian Sign Language (RSL) and find out whether the formal differences between nouns and verbs in RSL are similar to the ones found in other sign languages such as American Sign Language (ASL) [3] and Australian Sign Language (Auslan) [2] and to explain the observed differences.

Methodology. 41 pairs of pictures and short films demonstrating objects and actions with these objects were created to elicit 41 noun-verbal pairs. The pictures and films were presented to 11 native signers of RSL and the results were videotaped. After the data had been analyzed, we formulated the list of possible differences and created a second experiment. We took a number of signs from the first experiment with the differences observed and asked a group of other 15 signers to identify whether the signs in RSL were better translated as nouns or verbs in Russian.

Results. We found out that the signers of RSL use 8 different mechanisms to distinguish phonologically similar nouns and verbs. (1) Nouns often contain single movement, while the corresponding verb contains repeated movement (72% of the pairs). (2) A noun may contain no movement while the verb contains some (12% of the pairs). (3) Nouns are made with the shorter amplitude of the movement (92%). (4) Where a noun uses one joint, the verb can use two or more joints (32%). (5) A noun and the verb can have different handshapes (16%). (6) A noun and the verb can differ in orientation (9%). (7) A noun and the verb can differ in location (12%). Finally, (8) mouthing usually accompanies nouns, but not verbs (possible with all pairs). Importantly, 84% of the pairs can combine several differences at once, for example, differences (1) and (3) are observed together in 27 cases. Differences 1-4 are similar to the differences in ASL, and difference (8) is also mentioned for Auslan as well as other sign languages ([1], [4]), while other differences are special to RSL.

The second experiment showed that in 75% of the cases nouns and verbs are correctly identified by the signers.

Discussion. We claim that all differences observed for RSL can be explained by the fact that verbs tend to be more iconic, while nouns tend to be more economic. In verbs, repetition is used to represent iconically the repeated action, while nouns can be repeated without implying the plurality of objects; lack of movement or using the shorter amplitude in nouns is more economic; using more joints helps the verbs to preserve iconicity (to depict the action more thoroughly) while nouns, being economic, use less joints; differences in location, orientation and handshape also contribute to the iconicity of the verbs. It is also natural to suppose that mouthing usually accompanies nouns because being more economic they are less perceptually salient and need a supportive system.

References

- Hunger, Barbara. (2006). Noun/verb pairs in Austrian Sign Language (ÖGS). In: *Sign Language & Linguistics* 9. 71–94.
- Johnston, Trevor. (2001). Nouns and verbs in Australian Sign Language: an open or shut case? In: *Journal of Deaf Studies and Deaf Education* 6. 235–257.
- Supalla, Ted & Elissa Newport. (1978). How many seats in a chair? The derivation of nouns and verbs in American Sign Language. In P. Siple (ed.), *Understanding language through sign language research*, 91–131. New York: Academic Press.
- Voghel, Amélie. (2005). Phonologically identical noun-verb pairs in Quebec Sign Language (LSQ): Form and context. *Toronto Working Papers in Linguistics* 25. 68–75.

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Speaking with or without gestures: Which function(s) do gestures serve in bilinguals?

In face-to-face interaction, gestures, like speech, serve multiple functions. Amongst these functions, gestures appear to facilitate access to items in the mental lexicon (Nicoladis, 2002), they can convey substantive information to recipients (Goldin-Meadow, 2000), they can help speakers to package information into messages (Kita, 2000), they can facilitate some aspects of memory (Krauss, Morrel-Samuels, & Colasante, 1991), etc. However, there is no consensus about the main function provided by gestures amongst researchers, because gestures might serve not only one but several functions in a single interaction, and they seem to play a self-oriented and other-oriented function, they are used for the speaker and the recipient benefits (Alibali, Heath, & Myers, 2001). In addition, some recent support found that bilingual people use more gestures than monolinguals when they speak (Nicoladis, Pika, & Marentette, in press ; Pika, Nicoladis, & Marentette, 2006).

One interpretation of these results is that the use of gestures can help access words, specifically in the weaker language (Nicoladis, Pika, Yin & Marentette, 2007) because bilinguals often speak one language better than the other (Genesee & Nicoladis, 2007). To test this interpretation, we designed a study in which bilingual adults can and cannot gesture during speech. If gestures function primarily for language access, we predicted that bilinguals' spoken stories would be less detailed, particularly in the no-gesture, non-dominant language condition. 32 French-English bilingual adults took part in this project. All were from Edmonton, a mainly English-speaking area in Western Canada with an active French-speaking community. The participants watched two short segments of Pink Panther cartoons and were then asked to recount in English and in French (on different days to different people) what he or she had seen in the stories once with their hands free and once with their hands held still. We transcribed the adults' stories and coded for gestures according to McNeill's taxonomy (1992). We calculated the length of stories in both word tokens and number of scenes from the original cartoon that they included. We also measured the elaborateness of vocabulary by counting the word types used to tell the story. We predicted that it would be few differences between the two narratives in the no-gesture and gesture conditions in the bilinguals' dominant language. We also expected that we would observe big differences between the two narratives in the no-gesture and gesture conditions in the bilinguals' non-dominant language. Specifically, the narrative in the no-gesture condition would be much shorter and less elaborated than the narratives in the gesture condition. We discuss these results in terms of whether we can conclude that the primary function of gestures is to help language access.

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The linguistic variation of the signs used within the Deaf gay community in the United Kingdom

A study at Durham University from 2008 was undertaken to examine the linguistic variation of the signs used within the Deaf gay community in the United Kingdom in terms of morphology, phonology and syntax.

The aim of this research was to establish how much, if any, signs used in the Deaf gay community differ from that of Standard British Sign Language (BSL). These findings were examined from both a linguistic and sociolinguistic perspective, using parallels from research previously conducted with both spoken languages and American Sign Language (ASL).

The structure of the study primarily took the form of a review of three main documents; two from the United States focusing on the lexicon of the Gay Sign Variation (GSV) and information from the United Kingdom which analyses the features of Gay Male Sign Variation. Additionally, eight Standard BSL signs were analysed and compared to GSV.

Results showed that there were differences in Standard BSL and GSV in the following areas:

- Sign type and hand shape
- Key features of GSV – Style
- Identity – people using GSV

This information has implications for sign language interpreters working within the Deaf gay community with respect to comprehension and representation of this client base.

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Getting hold of time – Exploring the temporal window of gesture speech integration

In everyday face-to-face conversation, speakers not only use speech to convey information but also rely, amongst others, on co-speech gestures. Various studies have shown that, for instance, iconic gestures can affect speech comprehension (e.g. Kelly, Kravitz, & Hopkins, 2004; Wu & Coulson, 2005; Holle & Gunter, 2007; Özyürek, Willems, Kita, & Hagoort, 2007). Although being widely recognized as one of the crucial factors for gesture-speech integration (e.g. in the semantic synchrony rule by McNeill, 1992), the temporal aspects of this process have been understudied so far. In the present experiment, we explored the significance of timing for gesture-speech integration using a disambiguation paradigm. Participants were presented with short video clips of an actress uttering sentences like 'She was impressed by the BALL, because the GAME/DANCE...'. The ambiguous noun was accompanied by a dynamic iconic gesture fragment containing the minimal necessary amount of information to disambiguate the noun. This amount was determined by a context guided gating. We used four different temporal alignments between the noun and the gesture fragment: the uniqueness point of the noun was either prior (+120 ms condition), synchronous with (0 ms condition) or lagging behind the end of the gesture fragment (-600 ms/-200 ms conditions). ERPs triggered to the uniqueness point of the noun (i.e. BALL, immediate integration) showed that integration with the gesture fragment depended on timing, as all but the -600 ms condition resulted in N400 effects. In contrast, ERPs elicited at the later target word position (i.e. GAME/DANCE, delayed integration) showed N400 effects independent of timing. Thus, although there seems to be a crucial time window for immediate gesture speech integration, even gesture information present beyond this time window can exert a disambiguating influence.

References

- Holle, H., & Gunter, T. C. (2007). The role of iconic gestures in speech disambiguation: ERP evidence. *Journal of Cognitive Neuroscience*, 19(7), 1175–1192.
- Kelly, S. D., Ward, S., Creigh, P. Bartolotti, J. (2007) An intentional stance modulates the integration of gesture and speech during comprehension. *Brain and Language*, 101(3), 222–233.
- McNeill, D. (1992). *Hand and Mind – What Gestures Reveal about Thought*. Chicago, IL; London, UK: The University of Chicago Press.
- Özyürek, A., Willems, R. M., Kita, S., & Hagoort, P. (2007). On-line integration of semantic information from speech and gesture: Insights from event-related brain potentials. *Journal of Cognitive Neuroscience*, 19(4), 605–616.
- Wu, Y. C., & Coulson, S. (2005). Meaningful gestures: electrophysiological indices of iconic gesture comprehension. *Psychophysiology*, 42(6), 654–667.

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Walking language recognition

Body language is an unspoken language that is actually the most spoken. (Several works have been published about body language, describing it as a language which can be expressed by either the whole body [Lewis 2000, Alexander 1999 and Shephard 1991] or through specific body parts such as the face [Douglas and Hunt 1964]). Body language subconsciously expresses human feelings and emotions and has been investigated in depth by psychologists. Body language also serves as a means for universal communication when other means of communication such as speech are not possible, either due to an inherent inability to express internal physiological activities i.e. emotions due to external causes such as distance, noise or other disturbances (Badler et al 1998). Body language is universally understood and therefore may also be used when there is no known common language (Kuschel 1974). Finally, body language is also used for aesthetic purposes, such as choreography (Albright 1997).

The current article focuses on a special kind of body language which is expressed while walking. Specifically, this research describes a relatively new approach that focuses on a reduced set of body points (joints) and utilizes biometric measurements (Ophir et al 2007) to discreetly measure the frequency and amplitudes of the body movement while walking. A special technique uses image processing of decortications (Fig. 1 and Fig. 2) to discover the joints (Ophir et al 2007).

A Fourier transform analysis (Stein, E., M. and Shaakarchi R. 2003) of an individual's walking pattern can supply multi-level data, depending on the analysis level of the raw data. The initial data identifies the state whereby the individual is walking. A deeper analysis may indicate personal characteristics of the individual's walking pattern which can be used for personal identification. While the final analysis emphasizes the characteristics of the individual's mood.

The algorithm differentiates between emotional and calm movements. Unstable patterns indicate hesitation, sharp movements suggest determination. Creating a database of the various movements of an investigated person and the interpretation of those movements may slightly increase the reliability of the computer analysis.

The algorithm that compares the existing data prepared *a priori*, with a database of behavioural movements. The algorithm includes the following steps:

Alignment: Alignment is the operation by which the set of coordinates of the control-points is found.

Scaling: The two images to be compared must be of the same scale. Therefore, some image scaling should be done.

Least squares method: The square distances of corresponding points in the two sets are analyzed and their statistical parameters, such as average and standard deviation are calculated. The closer the average is to zero means an increase in the similarity between the two walking patterns (of the same person in various moods, enabling the moods comparisons, or of two persons enabling person recognition).

The proposed technique may provide a tool for security services by which they can more reliably interpret the behaviour of an interrogated suspect.

References

- Albright, A.C. (1997). *Choreographing difference: the body and identity in contemporary dance*; Wesleyan University Press.
- Alexander, M. D. et al. (1999). *Body language*. With an introduction by J. Elderfield, New York Museum of Modern Art, New York: Distributed by H. N. Abrams.
- Badler, N. and L. Zhao (1998). Gesticulation Behaviors for Virtual Humans, p. 161, Sixth Pacific Conference on

Computer Graphics and Applications (PG'98).

Bunke, H. and P.S. P. Wang (1997). *Handbook of Character Recognition and Document Image Analysis*, World Scientific Publishing Company, 1997;

Choset, H. et al (2005). *Principles of robot motion: theory, algorithms, and implementation*, MIT Press, Cambridge, Mass.

Clement, C. D. (1997). *Anatomy: A regional atlas of the human body*, Williams & Wilkins, Baltimore, MD.

Douglas D. and Hunt, K. (1964). *Pantomime: The silent theatre*, Atheneum, New York.

Fraenkel, J., Editor "Binat Yisum, Launching a Biometric Portable System Recognition-FALCONTROL", *Defence* (in Hebrew), p.53, No. 15, August 2006.

Kuschel, R. (1974). *A lexicon of signs from a Polynesian outlier island: a description of 21 signs as developed and used by Kagobai, the only deaf-mute of Rennell Island*, Psykologisk laboratorium, Kobenhavns universitet, Kobenhavn.

Lewis, H. (2000). *Body language: a guide for professionals*, Response Books, New Delhi.

MacKey D. (2003). *Information Theory, Inference, and Learning Algorithms*, Cambridge University Press, Cambridge.

Myler, H. R. and Weeks, A., R. (1993). *Computer Imaging Recipes* in C, P T R, Prentice Hall, Englewood Cliffs, NJ.

O' Gorman L. (1999). Fingerprint Verification, in *Biometrics*, Academic Publishers

Ophir, D. and Yakobian, M. (2008). *Biometry; Defence* (in Hebrew), p. 16, No. 21, January-February 2008.

Shephard, R. J. (1991). *Body Composition in Biological Anthropology*. Cambridge University Press, Cambridge.

Shiller, Z., Fujita, Y., Ophir, D. and Nakamura, Y. (2004). Computing a set of Local Optimal Paths through Cluttered Environments and Over Open Terrain; 13th Industrial Engineering and Management Conference, IE & M (March 16-17, 2004) p. 69c.

Figures:

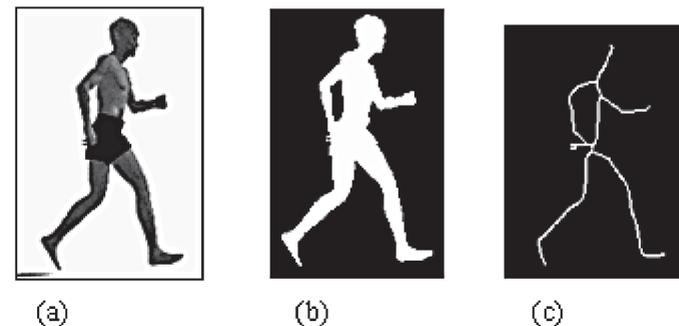


Figure 1: A figure being analyzed: (a) Figure, (b) Silhouette and (c) Skeleton.

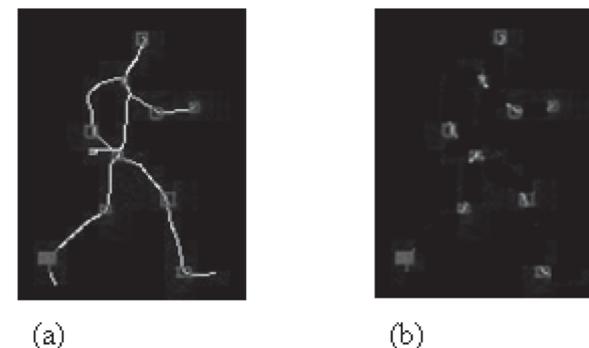


Figure 2: (a) A skeleton (Figure 5 (c)) with its indicated Control Points; (b) The separated CPs.

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Gestures and iconicity in the acquisition of phonology of sign languages in L2 learners

In spoken modality learners of a second language use grammatical and phonological features of their L1 and make some transfers to the L2 they are studying. Such transfers can be successful if the languages have overlapping rules, but unsuccessful when they do not. Hearing learners of a sign language fall into a unique situation given that the differences in modality do not allow spoken transfers. However, gestures and symbols are features present in their world knowledge and might be used as 'cognates' to facilitate the acquisition of highly iconic signs. The aim of this study is to determine the role of iconicity and gestural schemata in the acquisition of a phonological system of a signed language.

The study analyses and compares the errors produced by hearing adults and deaf infants learning British Sign Language (BSL) according to sign type (iconic vs. non iconic) and according to phonological parameter (handshape, location, movement and orientation). This presentation will focus only on the adults' errors. In the study, hearing true beginners enrolled in a BSL level 1 course were shown isolated signs with and without their English translation. These signs had varying degrees of iconicity and phonological complexity. After seeing each sign, participants had to reproduce them as accurately as possible. They were tested once before the course started and again when it finished twelve weeks later. Preliminary results show that subjects produced iconic signs more accurately than non iconic ones when they had access to the English translation. I suggest that learners use the similarities between their gestural knowledge and the iconic signs to map onto existing mental representation and hence execute phonological parameters of signs more accurately.

Results also showed error patterns like distalisation, movement deletion and handshape substitution which have been reported in acquisition of signed languages as an L1.

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Metaphorization of practical action and everyday life experience in words, emblems and coverbal gestures of spoken language

The paper focuses on the impact of practical action and experience on all aspects of oral language, segmental and suprasegmental, verbal and visual (i.e. gestural). It is based on observations of emblems and coverbal gestures in synergy with the words of spoken language over a number of years annotating and studying visual and verboacoustic manifestations in videotaped oral interactions.

Facial expressions, postures, gestures, and body movement in general are the visible part of the spoken utterance. They visually manifest the close semiotic interweaving of movement, space and words in human thought and consequently in human oral expression. The important part of this interweaving results from metaphorization or analogical converging of two notions that share one or more features and otherwise belong to different categories. Thinking and speaking are being experienced as just another form of activity such as the practical action of walking, running, handling objects, only transposed into the virtual world of cognitivelinguistic reality. Thus when speaking, we are handling concepts by using gestures and words as if they were the objects experienced in the outside material reality. The etymology of the words expressing abstract ideas often hide the metaphorical source domain of a concrete phenomenon in our practical life. For example, Latin word 'comprehendere' which means 'catch, get, grasp' or 'comprehend' in English, 'saisir' or 'comprendre' in French, 'shvatiti' in Croatian share the same underlying metaphor 'Understanding is catching'. Therefore the coverbal metaphorical hand gesture grasping an imaginary object seems to visually revitalize in the gesture space the metaphor became 'dead' in the linguistic framework. Dead metaphors are conventionalized to the point that for the majority of the native speakers it has become difficult or impossible to discern their original conceptual source. Of course, the metaphorical mappings often shared by the languages of the Occident are not applicable to the languages of the Amazon or to those of the Australian Aborigines.

The correspondences in verbal and gestural structuring of the metaphorical mappings in the given language are possible because words and gestures are parts of the single framework.

On one hand there's metaphoricality of the emblematic gestures basically pre-shaped by cultural and linguistic tradition. The etymology of the emblematic gestures and their idioms mostly derives from our practical experience and actions in the everyday life (e.g. in Croatian, 'Puna šaka brade' with the accompanying gesture is based on the metaphor 'Satisfaction is the hand wiping greasy chin after a hearty meal', and in French 'La barbe' and its gesture are based on the metaphor 'It is boredom to shave every day').

On the other hand there's the metaphoricality of the coverbal gestures which is at the same time shaped culturally and individually within the pragmatics of the multimodal utterance. We shall observe the examples of coverbal gestures in which the speaker's gesture space becomes the ground for 'objectification' and embodiment of spatial, temporal and abstract concepts and their interrelations.

The examples of metaphorizations in words and gestures show that thinking and speaking developed from practical action and everyday life experience and stay deeply embedded in it.

References

- Bouvet, D. (2001). *La Dimension corporelle de la parole. Les marques posturo-mimo-gestuelles de la parole, leurs aspects métonymiques et métaphoriques, et leur rôle au cours d'un récit*. Paris: Peeters.
Calbris, G. and J. Montredon. (1986). *Des gestes et des mots pour le dire*. Paris: Clé International.

- Calbris, G. and L. Porcher. (1989). *Geste et communication*. Paris: Crédif-Hatier.
- Calbris, G. (2003). *L'expression gestuelle de la pensée d'un homme politique*. Paris: CNRS Editions.
- Calbris, G. (2008). From Left to Right: Coverbal Gestures and Their Symbolic Use of Space. In Cienki and Müller (eds.) *Metaphor and Gesture*, 27–53.
- Cienki, A. and C. Müller. (2008). *Metaphor and Gesture*. Amsterdam/Philadelphia: John Benjamins.
- Colletta, JM. (2009). Comparative analysis of children's narratives at different ages : A multimodal approach. *Gesture* 9:1, 61–96.
- Cosnier, J. (2007). Le corps et l'interaction. In Chabrol, C., Orly-Louis, I. (eds), *Interactions communicatives*, Paris: Presses Sorbonne Nouvelle, 91–95.
- Croft, William and D. Alan Cruse. (2004). *Cognitive Linguistics*. Cambridge: Cambridge University Press.
- Feyereisen, P. (1987). Gestures and Speech. Interactions and Separations : A reply to McNeill (1985). *Psychological Review* vol 94 no. 4/1987, 493–498.
- Fricke E., Mittelberg I. and S. Teßendorf (2008). Inwieweit sind Gesten konkret? (Positionspapier zum Begriff des Konkreten in der Gestenforschung). Konferenzprogramm des 12. Internationalen Kongresses der Deutschen Gesellschaft für Semiotik (DGS) "Das Konkrete als Zeichen", Stuttgart.
- Goldin-Meadow, S. (2003). *Hearing Gesture: How Our Hands Help Us Think*. Cambridge, Mass.: Bellknap Press.
- Johnson, Mark. (1987). *The Body in the mind: The bodily basis of meaning, imagination and reason*. Chicago: University of Chicago Press.
- Kendon, A. (1992). Some recent work from Italy on quotable gestures ('emblems'). *Journal of Linguistic Anthropology* Vol. 2 (1), pp. 77–93.
- Kendon, A. (2004). *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
- Lakoff, G. and M. Johnson. (1980). *Metaphors We Live By*. Chicago and London: The University of Chicago Press.
- Lakoff, G. (1987). *Women, fire and dangerous things: what categories reveal about the mind*. Chicago: University of Chicago Press.
- Lakoff, G. (2008). The Neuroscience of Metaphoric Gestures: Why They Exist. In Cienki and Müller. (eds.) *Metaphor and Gesture*, 283–289.
- Levinson, S. C. (1996). Language and Space. *Annual Rev. Anthropol.* 25: 353–382.
- Levinson, S. C. (2003). *Spatial Language and Cognition*. Cambridge: CUP.
- McNeill, David. (1995). *Hand and Mind-What Gestures reveal about thought*. Chicago/London: The University of Chicago Press.
- Müller, C. (2008). What gestures reveal about the nature of metaphor. In Cienki, A., Müller, C., (eds.) *Metaphor and Gesture*, 219–245.
- Özyürek, A., Allen, S., Furman, R., Kita, S., Brown, A., Ishizuka, T. (2008). Development of Cross-Linguistic Variation in Speech and Gesture: Motion Events in English and Turkish. *Developmental Psychology* vol. 44, 4, 1040–1054.
- Pavelin, B. (2002a). *Le Geste à la parole*. Toulouse: Presses Universitaires du Mirail.
- Pavelin, B. (2002b). Statut et rôle du mouvement dans la communication orale en face-a-face. In Renard, R. ed., *La Phonétique verbotonale*, Tome 2. Bruxelles, Belgique : Editions des Boeck Université, 71–87.
- Parril, F. (2008). Form, meaning and convention : A comparison of a metaphoric gesture with an emblem. In Cienki, A., Müller, C., (eds.) *Metaphor and Gesture*, 195–217.
- Radden, G. (2000). How metonymic are metaphors? In *Metaphor and metonymy at the crossroads: a cognitive perspective*, editor Antonio Barcelona, 93–108. Berlin: Mouton de Gruyter.
- Reddy, Michael J. (1979). The Conduit Metaphor- a case of frame conflict in our language about language. In *Metaphor and Thought*. 1993. (2nd edition) ed. Ortony, Andrew. Cambridge: Cambridge University Press, 164–201.
- Wilcox, S.E. 2004. Cognitive iconicity : Conceptual spaces, meaning and gesture in signed languages. *Cognitive linguistics*, 15, 119–147.

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Individual differences in the role of gesture in lexical retrieval

Although gesture can complement a linguistic message, humans gesture even in the absence of an interlocutor, indicating that gesture may serve a function for the speaker as well as the listener. Both anecdotal and empirical evidence shows that humans gesture more while experiencing a tip of the tongue (TOT)—struggling to produce a word that they know. Yet the evidence that gesture actually facilitates word retrieval is mixed. In Experiment 1, 87 monolingual English speakers (M=19.47, range: 18-22) participated in a picture naming study, and were assigned to one of three conditions, gesture allowed, gesture inhibited, or neck inhibited, such that individual participants in each condition were matched on age and educational background, two variables known to affect word retrieval performance. Participants in each condition named the same set of 52 pictures with low-frequency words. In the gesture-inhibited condition, participants wore gloves that were velcroed to a wooden board. In the neck-inhibited condition participants wore a cervical collar.

There were no differences between the three groups in the number of words correctly retrieved ($F(2,84) = .75$, $p = .47$, $\eta^2 = .02$) or the number of TOTs ($F(2,84) = .33$, $p = .72$, $\eta^2 = .008$). Participants in the gesture allowed condition were able to resolve more of their TOTs than those in the inhibited conditions ($F(2,84) = 3.35$, $p = .04$, $\eta^2 = .07$), although the performance of those in the inhibited condition was significantly more variable than in the allowed condition (Levene's test for equality of variance: $F(2,84) = 4.06$, $p = .02$): some participants in the inhibited condition were more affected by not being allowed to move some parts of their body than others were.

Experiment 2 explored the individual differences that could affect gesture's impact on the ability to resolve TOTs. 24 monolingual English speakers (M=19.42, range: 18-22) participated in a within-subjects study where they named 52 pictures while allowed to gesture and 52 pictures while their gestures were inhibited. Order of conditions and materials were counterbalanced across participants. Participants also completed the Corsi Blocks spatial memory span task and the digit span auditory working memory task. We found no difference between the conditions on any dimension of word retrieval, even in the proportion of resolved TOTs. However, we found a significant relationship between digit span and the ability to resolve a TOT while unable to gesture, even when controlling for individual use of gesture and the proportion of self-resolved TOTs in the gesture-allowed condition ($r = .63$, $p = .002$). Countering some hypotheses, spatial working memory played no role in TOT resolution rates ($r = .29$, $p = .21$). Only those participants with weaker auditory working memory rely on gesture to aid them in the resolution of TOTs.

These findings support a model of working memory that allows the load placed on the auditory working memory system to be off-loaded through body movement.

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Why do we gesture? Experiments on hearing and deaf subjects

The hypothesis of a unique neurological foundation for both speech and gesture has been proposed by several authors, among which Kendon (2004) and McNeill (2005). This study is aimed at further investigating the possibility of a single neuro-motor basis for speech and gesture by means of an analysis of multi-modal spontaneous communication in two congenitally profoundly deaf subjects, and a comparison of these data with the materials already available from hearing participants in conditions of multi-tasking and in normal face-to-face interactions.

The existence of a uniform pattern for gesture and speech has been firstly outlined by Kendon (1980; 1986), who hypothesized a relationship between Tone Unit and Gesture Phrase.

This synchronization pattern, adopted and put forward by McNeill (1985), who stated that gestures “are synchronized with linguistic units in speech” (McNeill, 1985:360), was dismissed by Butterworth and Hadar (1989), who provided a review of different studies on gesture/speech synchronization that led to different findings.

According to the authors, “these findings complicate McNeill’s (1985) first assertion that a gesture occurs at the same time as the related speech event, and they refute the claim of universal synchrony between gesture and speech, even in the minimal sense of temporal overlap” (Butterworth and Hadar, 1989:171).

In a reply to Butterworth and Hadar (1989), McNeill (1989) stated that, on the question of temporal relations between gesture and speech, “Butterworth and Hadar (1989) failed to distinguish the successive phases of gesture production (Kendon, 1980)” (McNeill, 1989:176). Of course, the different phases synchronize differently with the accompanying speech. In particular, the preparation phase has been observed to slightly anticipate the onset of semantically related speech (Bull and Connelly, 1985), while the stroke phase has been found to “...end at, or before, but not after, the phonologically most prominent syllable of the accompanying speech” (Kendon, 1980 quoted in McNeill, 1989:176). The synchronization pattern above explained may help further research on the assessment of the cognitive and computational origin of gesture and could be consistent with other research carried out on the synchronization of gesture and other non-verbal cues with speech (Kelso et al, 1981, Hayashi et al. 2005, Kendon, 1972, McNeill, 1992)

The hypothesis here put forward is that the observation of this synchronization pattern in congenitally deaf orally educated subjects and in hearing subjects intent in multi-tasking or in face-to-face dialogue, would prove that this pattern is inborn and, therefore, that it is not learned on imitation.

In fact, if this synchronization pattern were acquired by imitation, an experiment on congenitally profound deaf subjects or in hearing subjects under masked conditions would highlight some disruptions of the synchronization between gesture and speech.

The results obtained thus far are also maintained to support the hypothesis of the semiotic evolution of gestures from a condition of unavoidable limb movements occurring during speech, and due to neurological structures, to the use of such movements for intended, and thus communicative, purposes.

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The semantic interplay of speech and co-speech gestures during pain communication

Within both clinical and everyday settings the effective communication of pain is essential if the experience is to be understood and empathy given to the sufferer. There is considerable evidence to suggest that the verbal channel alone is insufficient to provide a full and adequate representation of the pain experience and thus that additional information about the experience must be obtained via alternative means (Ehlich, 1985; Ryle, 1949). Numerous studies into human communication have provided evidence that co-speech gestures are an integral part of language and are crucial to successful communication. However, the majority of studies investigating the communicative value of gestures have employed paradigms focusing on neutral topics of talk in which participants describe a controlled stimulus material (e.g. a cartoon or picture) to another participant. While this paradigm has undoubtedly provided valuable evidence in this area, very little is known about the communicative function of gestures within more applied communicational settings. Thus, we investigated the relative contributions of speech and gesture to the representation of meaning when participants were asked to communicate about a recent physical pain experience. In doing so we aimed to investigate (i) whether gestures add important information to the verbal component of speakers’ utterances, (ii) if so, what aspects of speakers’ pain descriptions are encoded in the gestural modality, and (iii) provide support for the communicative function of gestures in a more applied, naturalistic setting. A semantic feature approach (e.g. Beattie & Shovelton, 2001) was used to investigate and quantify the information contained within referential gestures (such as iconic and deictic gestures, McNeill, 1992) and the accompanying speech. The individual gesture-speech units were coded according to whether they contained information about eight semantic aspects of the pain experience: location, size, quality, duration, cause, effects, intensity and presence, and whether this information was contained in speech only, gesture only, or speech and gesture together. The results indicated that information about the location and size of the pain was conveyed significantly more in gesture alone, suggesting that this information may be more amenable to gestural than verbal representation. Further, for all of the remaining semantic features except ‘intensity’ a significant proportion of information was represented in gesture and speech together, suggesting that gesture aids the communication of this information within the pain communication process. These results support the findings of previous research that gestures complement and clarify the information contained in speech and contain important information that is not contained in speech at all (e.g. Holler & Beattie, 2003; McNeill, 1992). Thus, these findings highlight the communicative value of gestures within a more natural and applied communicational context than has previously been investigated. Furthermore, these results suggest that co-speech gestures offer a means by which we can obtain additional information to supplement and clarify the problematic verbal report of pain experiences. In the long term, this research may allow us to improve the empathy and support we provide to pain sufferers.

References

- Beattie, G., & Shovelton, H. (2001). An experimental investigation of the role of different types of iconic gesture in communication: A semantic feature approach. *Gesture* 1, 129–149.
- Ehlich, K. (1985). The language of pain. *Theoretical medicine*, 6, 177–187.
- McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago: Chicago University Press.
- Holler, J., & Beattie, G. (2003). How iconic gestures and speech interact in the representation of meaning: are both aspects really integral to the process. *Semiotica*, 114, 86–116.
- Ryle, G. (1949). *The Concept of Mind*. London, New York: Hutchinson’s University Library.

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ELAN – A multimedia annotation tool for multimodality research, an update

ELAN is a multimedia annotation tool that is being developed at the Max Planck Institute for Psycholinguistics. Its development started about ten years ago and the tool has been extended ever since. It is applied in several types of research such as gesture and sign language research, but also in language documentation projects etc. In this paper an overview is given of the main functionalities the tool currently has to offer, with special attention for the latest developments.

ELAN can be used with audio as well as video files. Up to six videos can be associated with a single annotation document, four of which can be displayed simultaneously in the main window. Media playback in ELAN is based on one of the available media frameworks (e.g. QuickTime, Windows Media Player) of the operating system it is running on. Support for media file formats depends on the available frameworks. A rich set of media player controls is provided, allowing for stepping through the media with different step sizes.

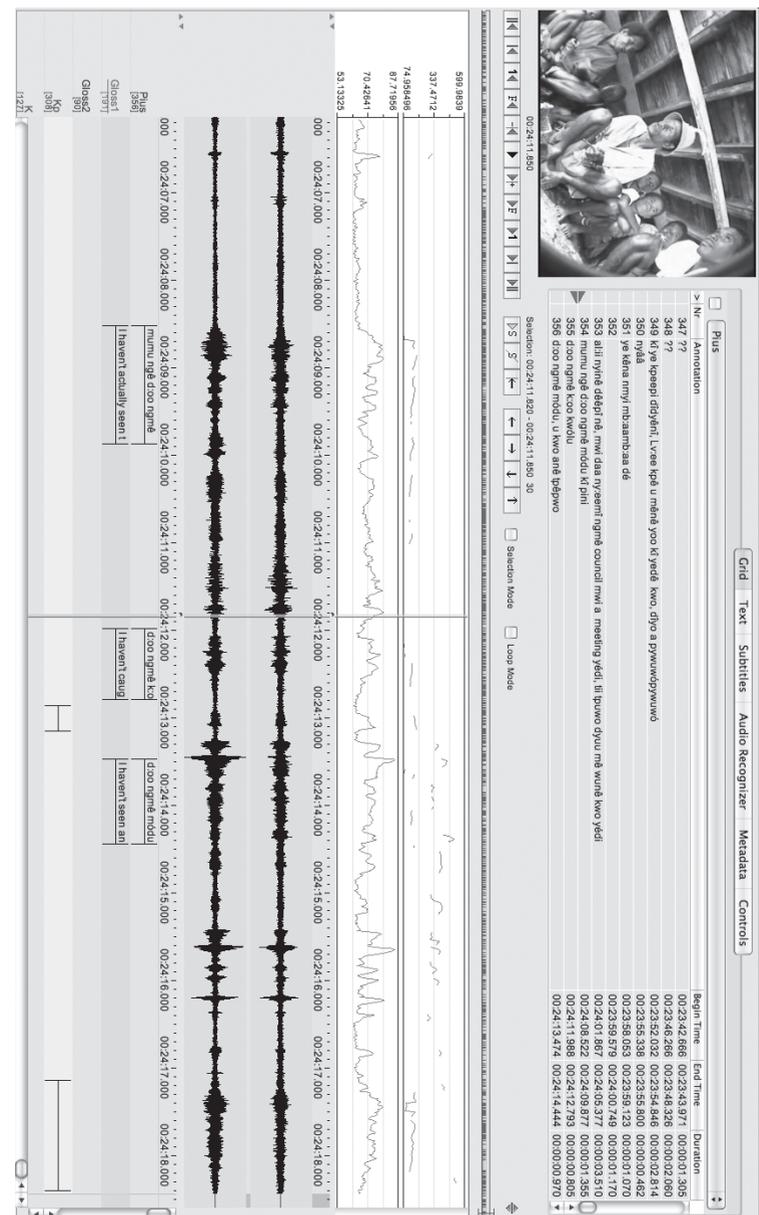
Apart from audio and video, time series data are supported as a secondary, supplementary data type. The source of this kind of data can be motion-tracking devices (such as cyber gloves), eye-trackers etc. or software that extracts data from the primary audio or video file(s). A dedicated viewer has been developed for such data.

Each annotation in ELAN is added to a tier object, which is a kind of a layer and a container for annotations. A transcription can consist of any number of tiers and tiers can be grouped hierarchically, i.e. a tier can have a parent tier and multiple child tiers. This multiple layer approach facilitates modeling of relations between annotations.

Powerful search options are available. A query can be executed either in the current, open document or in a user definable set of transcriptions. The query can be expressed in terms of temporal and/or structural relations between annotations, either within the same tier or across tiers. Regular expressions can be used and a special search for n-gram patterns is provided for. The search results can be shown and saved in concordance view or as a frequency table. Besides that, hit statistics can be exported as well, per file or for the whole search domain.

Interoperability with other tools is mainly realized by means of import and export functions for popular formats. Export to tab-delimited text is a common way to transfer data to spreadsheet and statistics applications. ELAN stores its data in its own XML (eXtensible Markup Language) file format, EAF.

The annotation process still consists mainly of manual labor, but the MPI-PL is involved in several initiatives aiming at automating part of the segmentation and labeling process.



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A glimpse at the relation between basic actions and gestures of orang-utans

Abstractions of non-communicative, practical/instrumental actions – or their motor patterns – are known to serve as foundations of human gestures (e.g. LeBaron & Streeck 2000). Teßendorf (2005), for instance, analysed the ‘brushing-aside gesture’ as based on the common action of brushing small, annoying objects aside. In this paper, we would like to hint at how research on the communication of orang-utans might also benefit from analysing correspondences and deviations between basic actions and gestures. This might be interesting because more or stronger deviations from underlying actions (i.e. less similarity) entail less iconic relations and thus require a relatively higher cognitive-semiotic capacity to produce and interpret the gestures they give rise to (cf. e.g. LeBaron & Streeck (2000) who showed that understanding gestures that differ significantly from their respective basic actions requires broad, adequate background knowledge).

One possible application of this paper’s general suggestion focuses on the discrimination of tactile (including physical contact between the interacting animals) and visible (distant signals) orang-utan gestures (cf. Liebal, Pika & Tomasello 2006). With regard to basic actions, two gestures that share the same mode do not necessarily require the same cognitive-semiotic level of competence to produce or interpret them. For example, producing or interpreting a visual gesture which is grounded in a visual basic action ought to be less demanding than producing or interpreting a visual gesture which is grounded in a tactile basic action.

We also propose applying Kendon’s (2004) distinction of gesture phases to basic actions. As Müller (1998) observed, gestures that use the ‘acting mode’ to signify may only partly mime basic actions. Whether they do this, and if so in what respect, can be specified by taking the phases of the basic action and their representation in the gesture stroke into account. A gesture in which the stroke repeats all of the basic action’s phases should be less demanding on cognitive resources than a gesture in which the stroke only replicates a reduced number of the basic action’s phases in which it is grounded.

By considering these and other features of orang-utan gestures with regard to the respective characteristics of their basic actions, we suggest that a more precise categorization of gestures can be arrived at by taking into account similarities in the relative cognitive-semiotic levels of resources they require. Additionally, this approach is open to application in comparative studies of gestures observed in other species.

References

- Kendon, Adam (2004). *Gesture: Visible Action as Utterance*. Cambridge: Cambridge University Press.
- LeBaron, Curtis & Streeck, Jürgen (2000). Gestures, knowledge, and the world. In: McNeill, David (ed.): *Language and gesture*. Cambridge: Cambridge University Press.
- Liebal, Katja, Pika, Simone & Tomasello, Michael (2006): Gestural communication of orangutans (Pongo pygmaeus). In: *Gesture* 6:1.
- Müller, Cornelia (1998). *Redebegleitende Gesten. Kulturgeschichte – Theorie – Sprachvergleich*. Berlin: Arno Spitz.
- Teßendorf, Sedinha (2005). Pragmatische Funktionen spanischer Gesten am Beispiel des “gesto de barrer”. Unpublished Master Thesis, Free University Berlin.

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Gestures of future language teachers

We tend naturally to adapt our speech to make it easier to understand when we talk to a foreign person: we use more basic terms, shorter sentences, and the present tense more often. We also articulate more, speak more slowly, talk more loudly, and use gestures. This register is called foreigner talk (Ferguson, 1975).

Within second language acquisition research, the adjustments that speakers make in addressing non-native speakers (Wesche & Ready, 1985) and its effectiveness in facilitating acquisition (Long, 1980) have been explored. However, gesture in foreigner talk was not examined until Adams (1998) conducted his study. Adams (1998) showed that gesture production and the types of gestures speakers use are also affected by the presence of non-native interlocutors. He hypothesized that native speakers would use more mimes, iconics and deictics with non-native speakers because these particular gestures are meaningful and helpful in interpreting the verbal language (1998, p. 29-30). He found that these types of gestures were more frequent, but the difference was not statistically significant except for the deictic gestures which were more numerous in the non-native condition. Adams also hypothesized that native speakers would use fewer metaphors and emblems in the non-native condition because these are less easy to decode. However, the data showed the same amount of emblems and metaphors in both conditions. These results showed that even if native speakers gestured more to help their interlocutors understand them, they did not use relevant gestures.

Foreign language teachers tend to gesture a lot in a classroom (Tellier, 2008; Sime, 2008). It is commonly acknowledged that ‘teaching gestures’ (i.e. gestures used deliberately by teachers to help their students) capture attention and make the lesson more dynamic. They have been shown to support comprehension and they may be relevant for learners’ memorization processes (Sime, 2008, Tellier, 2008).

Several aspects of teaching gestures are still not known, however. For example, are teaching gestures specific, or are they just like the ones the speakers use to address a foreigner? Are future teachers aware of their gestures before they undergo teacher training and are in the classroom, and do they naturally adjust their gestures when performing the same task with a native or a non-native speaker?

In this paper, the researchers will discuss the study they conducted to explore the differences in the gestures of future French foreign language teachers when they engage in a vocabulary explanation task with native and non-native speakers of French. They will report on the differences observed in both conditions, i.e., gesture rate, use of gesture space and types of gestures as well as relevant verbal differences such as the use of examples and metalinguistic terms.

References

- Adams, T. W. (1998). Gesture in foreigner talk. Unpublished Ph.D. Dissertation. University of Pennsylvania.
- Ferguson, C. (1975). Toward a characterization of English foreigner talk. *Anthropological Linguistics*, 17, 1–14.
- Long, M. H. (1980). Input, Interaction and second language acquisition. Unpublished Ph.D. Dissertation. University of California, Los Angeles.
- Sime, D. (2008). “Because of her gesture, it’s easy to understand” – Learners’ perception of teachers’ gestures in the foreign language class. In S. G. McCafferty and G. Stam (Eds.), *Gesture: second language acquisition and classroom research* (pp. 259–279). New York: Routledge.
- Tellier M. (2008). Dire avec des gestes. In F. Chnane-Davin & J. P. Cuq, (Eds.), *Du discours de l’enseignant aux pratiques de l’apprenant en classe de français langue étrangère, seconde et maternelle*. Le Français dans le monde, recherche et application, 44.
- Wesche, M. B. and Ready, D. (1985). Foreigner talk in the university classroom. In S. M. Gass and C. G. Madden (Eds.), *Input in second language acquisition* (pp. 89–114). Rowley, MA: Newbury House Publishers, Inc.

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Gestures and gaze as turn-allocation devices: The case of translation sequences in music pedagogical contexts

Interaction in music settings is characterized by a growing internationalization, affecting both ensembles' formation and educational activities, often lead in a specific country by foreign, internationally recognized musicians.

Similarly to communication among professional musicians, interaction between teaching musicians and music students not sharing the same mother tongue often takes place without the help of an official interpreter, thus giving rise to the use of a *lingua franca*, especially English, and/or to the emergence of occasional translation provided by participants themselves.

While occasional, non professional translation has been studied with reference to contexts like healthcare, services for immigrants, work meetings, little is known as regards music settings; furthermore, investigations on the multimodal coordination between the current speaker and the occasional translator for the accomplishment of the translation activity are still rare.

The current presentation, based on audio-videorecorded materials collected within a jazz music workshop held in an exolingual setting, focuses on translation sequences, specifically on the way they are opened and closed through the mutual verbal and non verbal 'work' of the conductor and the non-professional translator.

The analysis shows how specific gestures and gaze orientation by the conductor, in conjunction with verbal activity or not, are interpreted as a request for translation, operating as next-speaker (translator) other-selection and initiating a translation sequence; closing such sequences is also characterized by the conductor's verbal and non verbal activity (visual orientation, positioning in space, exhibiting gestural directives) leading to music interaction.

By examining the fine-tuned coordination displayed by translators and conductor in accomplishing the translating task, as well as further participants' type of participation during translation, it is claimed that non verbal resources typically employed in music interaction for selecting next-musician(s) and activating music action (pointing, gazing, down-beat) become resources for verbal interaction in the context under examination, thus resulting in the emergence of endogenous practices strongly connected with musicians' professional competence.

References

- Baraldi, C. & Gavioli, L. (2007). Dialogue interpreting as intercultural mediation: an analysis in healthcare multicultural settings. In Grein, M. & Weigand, E. (eds.). *Dialogue and Culture*, Benjamins, Amsterdam/Philadelphia, 155–176.
- Boyes Bräm, P. & Bräm, T. (2004). Expressive gestures used by classical orchestra conductors. In Müller, C. & R. Posner, R. (eds.). *The semantics and pragmatics of everyday gestures*. Weidler: Berlin, 127–143.
- De Stefani, E., Miecznikowski, J. & Mondada, L. (2000). Les activités de traduction dans des réunions de travail plurilingues. Können Sie vielleicht kurz übersetzen? *Revue française de linguistique appliquée* V(1), 25–42.
- Goodwin, C., (2000). Action and embodiment within situated human interaction, in *Journal of Pragmatics* 32, 1489–1522.
- Goodwin, C. (1994). Professional Vision. *American Anthropologist* 96, 606–633.
- Kendon, A., (2004). *Gesture: Visible Action as Utterance*, Cambridge University Press, Cambridge.
- Poggi, I., (2002). The lexicon of the conductor's face. In McKeivitt, P., S. O' Nuallain, O' & Mulvihill, C. (eds.). *Language, Vision, and Music*. John Benjamins, Amsterdam, 271–284.
- Pugliese, R. & Veschi, S. (2006). Contesti istituzionali e comunicazione interculturale con mediazione spontanea. In Banfi, E. et al.(eds.), *Problemi e fenomeni di mediazione linguistica e culturale*, Guerra, Perugia, 35–61.
- Rudolf, M. (1994). *The grammar of conducting: A comprehensive guide to baton technique and interpretation*. Schirmer: New York.
- Schmitt, R. (ed.) (2007). *Koordination. Analysen zur multimodalen Interaktion*, Narr, Tübingen.

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An ERP study about abstract pointing in a verbally ambiguous situation

It was explored whether abstract pointing gestures (APs) can resolve an ambiguous situation during speech comprehension. Contrary to concrete pointings, APs are directed to physically empty space while talking about a certain object. The object's meaning is assigned to the empty space by the pointing gesture itself (McNeill, Cassell, & Levy, 1993). Participants watched a video, where an interviewer and an interviewee talked about various dualistic topics like "Donald Duck and Mickey Mouse". During her responses, the interviewee conducted APs and established a certain gesturing order, e.g. "Donald – left pointing" and "Mickey – right pointing". Verbally, her last response to a particular topic was at first ambiguous, but finally explicit. Asked for who is more popular with kids, for example, she answered "Maybe this character? I think I have read once that there is a higher circulation for Donald Duck comic books." At the ambiguous part ("this character"), the interviewee made an AP, which was either congruent with the later on verbal disambiguation ("Donald") or incongruent. Event-related potentials triggered to the onset of the disambiguating word were analyzed. Preliminary results of 36 subjects show a positive deviation for the incongruent condition compared to the congruent condition between 570 and 660 ms after word onset. This finding indicates that APs were processed when presented during the ambiguous phase of the context. We interpret this P600-like effect as reflecting a reanalysis process.

Reference

- McNeill, D., Cassell, J., & Levy, E. T. (1993). Abstract deixis. *Semiotica*, 95, 5–19.

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The role of mouthing in foreign-deaf interactions, ASL and РЖЯ

There has been an ongoing inquiry of the degree to which the hands and mouth integrate in sign language (Sandler, in press; Vogt-Svendsen, 2001; Hohenberger and Happ, 2001). It is difficult to determine what linguistic status mouthing has. Some believe mouthing is an integral component of sign languages while others dismiss it as having no status in the language (Hohenberger and Happ, 2001).

A current claim is that part of the natural language instinct involves the hand and mouth working together to create “symbolic symbiosis” (Sandler, in press). The existence of mouthing and signing coordination strengthens the case for the instinct to use the hand and mouth in producing language. Research in the evolution of language has proposed a biological link between hand and mouth (Armstrong et al., 1995), or that humans first gestured, then spoke (Arbib, 2005). As speech and gesture seem to only have success when somehow combined (McNeill, 1992), the same appears true for mouthing with manual signs. The two systems are very different, yet support each other (Sandler, in press). In a similar vein, bilingual bimodals use phonetic mouthing to support manual signs in interpretation (Weisenberg, 2009).

Ebbinghaus (1998) remarks that in International Sign Language (ISL), mouthings are restricted since the patterns of iconic mouthing or types which reflect phonological remnants might inhibit mutual comprehension between foreign deaf. Moody (2007) specifically teaches interpreters not to utilize mouthing during ISL trainings. Rather foreign deaf conversations exploit the iconic nature of manual gestures. Goldin-Meadow and McNeill (1999) suggest that the “oral modality is not well suited to conveying messages mimetically...” (p. 155). In sign languages the mouth does in fact do a poor job of conveying phonological information from speech (Keller, 2001). One must not overlook the fact that signing without mouthing is an option, just as gesturing is not mandatory with speech.

This is a preliminary examination of foreign-to-foreign deaf interactions with users of Russian Sign Language (РЖЯ) in contact with American Sign Language (ASL). A comparison of mouthing patterns of РЖЯ and ASL reveals why signers do not benefit from, and do avoid, each other’s mouthings. Briefly, in РЖЯ signs that have a mandatory co-articulation with an iconic mouth gesture of “tongue-tip” such as Любопытный (‘curious’), Самый маленький (‘very small’), Псих (‘loony’), Насмехаться (‘mock’), Пропустить (‘let slip’), whereas in contrast ASL displays different tongue or lip combinations such as “mm” for curiosity or “bop” for ‘let slip’. The avoidance is further substantiated by comparing phonetic mouthing in ASL for signs such as LEAVE or WILL or iconic mouth gestures using the tongue which traditionally convey distance in ASL (Bridges & Metzger, 1996). Foreign-to-foreign signing encapsulates a very primitive interaction with the mimetic capacity of the hands fully exploited.

This exploration is significant to educating gesture linguistics about the sign-phonetic interface of the uncommonly studied РЖЯ, and questioning the role of the mouth in sign language communication, if we are to build on and refine our theory of bimodal language in humans.

References

- Arbib, M. A. (2005) The Mirror System Hypothesis: How did protolanguage evolve? In Maggie Tallerman (Ed.), *Language Origins: Perspectives on Evolution*. Oxford University Press.
- Armstrong, D. F., W. C. Stokoe, and S. E. Wilcox. (1995). *Gesture and the Nature of Language*. Cambridge: Cambridge University Press.
- Bridges, B. & M. Metzger (1996). *Deaf Tend Yours: Non-Manual Signals in ASL*. Silver Spring, MD: Calliope Press.
- Ebbinghaus, H. (1998). Warum deutsche Wörter wesentliche Bestandteile der Deutschen Gebärdensprache sind (Teil II). *Das Zeichen*, 46, 594–611.
- Goldin-Meadow, S. and D. McNeill (1999) The role of gesture and mimetic representation in making language the

province of speech. In M. Corbalis & S. E. Lea (Eds.) *The Descent of Mind*. New York: Oxford University Press

Hohenberger, A. and Happ, D. (2001): The Linguistic Primacy of Signs and Mouth Gestures over Mouthing: Evidence from Language Production in German Sign Language (DGS). In: P. Boyes Braem & R. Sutton-Spence (Eds.), *The Hands are the Head of the Mouth: The Mouth as Articulator in Sign Language*. Hamburg: Signum, 153–189.

Keller, J. (2001): Multimodal representations and the linguistic status of mouthings in German Sign Language (DGS). In: P. Boyes Braem & R. Sutton-Spence (Eds.), *The Hands are the Head of the Mouth: The Mouth as Articulator in Sign Language*. Hamburg: Signum, 153–189.

McNeill, D. (1992). *Hand and mind: What gestures reveal about thought*. Chicago: University of Chicago Press.

Moody, B. (2007, April 21) International Sign Language. [presentation]. New York, NY.

Sandler, W. (in press). Symbiotic symbolization by hand and mouth in sign language. *Semiotica*.

Vogt-Svendsen, M. (2001). A comparison of mouthings and mouth gestures in Norwegian Sign Language (NSL). In Penny Boyes-Braem & Rachel Sutton-Spence (eds.), *The hands are the head of the mouth*, 9– 40. Hamburg, Germany: Signum.

Weisenberg, J. (2009) *Audience Effects in American Sign Language Interpretation*. Published dissertation. Stony Brook University. New York.

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Intelligibility of gestures with and without speech in aphasic speakers

There is broad consensus that speech and gesture are closely related but the precise relationship remains unclear. McNeill (1985) supposed a single cognitive representation giving rise to both verbal and gestural expression. With respect to patients suffering from aphasia consecutive to brain damage this assumption predicts that language impairment is regularly accompanied by a similar impairment of gesture production which prevents patients from using gestures as an alternative means of communication. Indeed, parallel breakdown of speech and gesture has been observed in single patients with aphasia (e.g. Cicone et al. 1979, Glosser et al. 1986). By contrast, more recent studies assume that aphasic patients use gestures to compensate for their linguistic deficits (e.g. Hadar 1998, Lott 1999).

Our study has two parts. Firstly, we will assess intelligibility and informational richness of gestures produced by aphasic speakers. Patients will be shown video-clips and asked to retell them. The intelligibility of their gestures will be evaluated by healthy speakers in a recognition paradigm and will be compared to measures of the severity of aphasia. If patients use gestures for compensating their linguistic deficits, gestures of patients with more severe aphasia should convey more information than gestures of patients with less severe aphasia.

In a second condition, we will ask the patients to retell the video-clips without speech, using only gestures. Together with the first condition this allows a comparison between gesture with and without accompanying speech. If the intelligibility and clearness of gestures relies on a close collaboration of gesture and speech, the diversity and informational richness of their gestures should be better in the verbal than in the non-verbal condition. Furthermore, the explicit instruction to use gestures as sole means of expression resolves the potential pitfall that patients with better verbal skills are able to use gesture as a compensatory means of communication, but do not use them spontaneously, because they do not need them for transmission of messages.

Procedure:

Eight aphasic speakers with moderate to severe impairment of verbal expression were videotaped while retelling six short video-clips in two conditions. Clinical assessment included an aphasia test, praxis tasks and tests of semantic processing. In the first condition, the patients were asked to retell the stories in a vivid and descriptive manner. In the second condition, they were asked to retell the video-clips again but this time “without words”, exclusively by using gestures. We used these narrations as stimulus material in a forced-choice identification paradigm. Nine healthy persons were trained with the six video-clips. Subsequently, they watched silent video recording of the patients’ verbal and non-verbal narration videos in a random order. The healthy subjects tried to guess which video was being retold and rated which relevant parts of the story they could make out, and how sure they were about their decision.

References

- Cicone, M., Wapner, W., Foldi, N., Zurif, E., & Gardner, H. (1979). The relation between gesture and language in aphasic communication. *Brain and Language*, 8, 324–349.
- Glosser, G., Wiener, M., & Kaplan, E. (1986). Communicative gestures in aphasia. *Brain and Language*, 27, 345 – 359.
- Hadar, U., Wenkert-Olemik, D., Krauss, R., & Soroker, N. 1998a. Gesture and the processing of speech: neuropsychological evidence. *Brain and Language*, 62, 107 – 126.
- Lott, P. (1999). *Gesture and Aphasia*. Bern, New York, Wien: Lang.
- McNeill, D. (1985). So you think gestures are nonverbal? *Psychological Review*, 92, 350 – 371.

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Do deictic gestures facilitate memory?

Deictic gestures signal out references in a physical context. Previous studies have suggested that deictic gestures can direct listeners’ attention to specific objects and make listeners pay more attention to the critical aspects of a situation (e.g., Heiser, Tversky & Silverman, 2004; Tversky, Heiser, Lee & Daniel, 2009). If one pays more attention to a particular object that is accompanied with a deictic gesture, is he/she more likely to remember that object than the one without a deictic gesture? Our study aimed to address this issue.

Thirty adults were involved in this study. Participants were asked to remember the spatial layout of furniture shown in the pictures in three conditions. In the condition eliciting deictic gesture, the participants were instructed to point at the red dot with the index finger of their dominant hand. The red dot appeared for 2 seconds on top of each furniture item and appeared to move horizontally from item to item and from left to right. In the dot-only condition, the movement of red dot was the same as that in the condition eliciting deictic gestures but the participants were instructed not to point at the red dot. In the control condition, the red dot was not provided. After presentation of each room, participants underwent a recognition task. They were presented with an empty room and 30 items (15 targets, 15 distractors) that were randomly located on a computer screen. They were instructed to drag the target furniture items to the room in the correct location. The resulting coordinates (in pixels) of each item were logged using E-prime software.

We analyzed the mean proportion of target items accurately recalled (see Figure 1) and the mean proportion of target items in correct location (see Figure 2) in each condition. Results showed that there was significant difference among the means of the three conditions, $F(2,179)=7.42$, $p=.001$. Tukey HSD procedure showed that the proportion of target items accurately recalled in the dot+point condition was significantly lower than that of the condition with no dot and the condition with the dot only, $p < .05$ for both comparisons. There was also a significant difference between the means of proportion of target items in correct locations, $F(2,178)=21.2$, $p < .001$. Tukey HSD procedure showed that the proportion of target items recalled with accurate location in the dot+point condition was significantly lower than that recalled in both the condition with no dot, and the condition with dot only, $p < .01$ for both comparisons.

Our findings suggested that deictic gestures do not facilitate memory recall but could interfere with it instead. When the task is not cognitively demanding (e.g., encoding furniture items that are laid out on a picture), we may not need deictic gestures to increase attention and memory span. Since all the items were clearly depicted on the pictures, pointing might have distracted the participants from memorizing those items and their spatial locations.

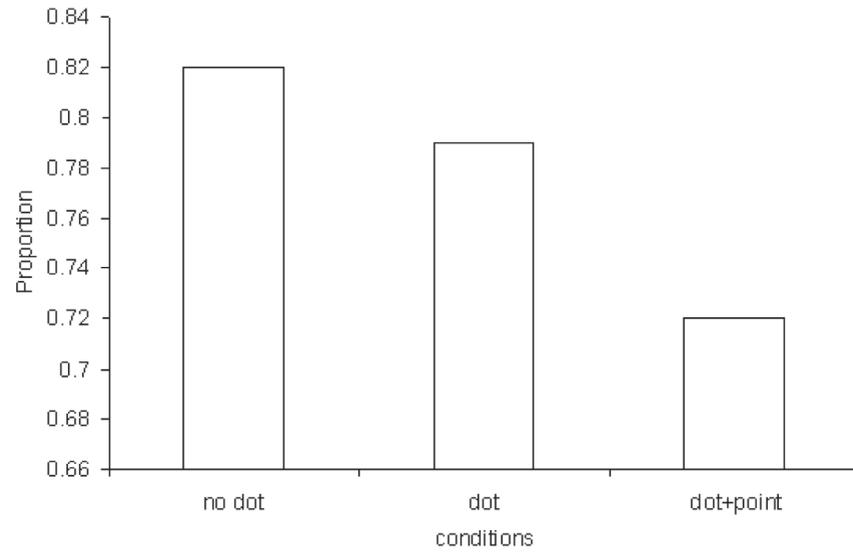


Figure 1. Mean proportion of target items recalled across conditions.

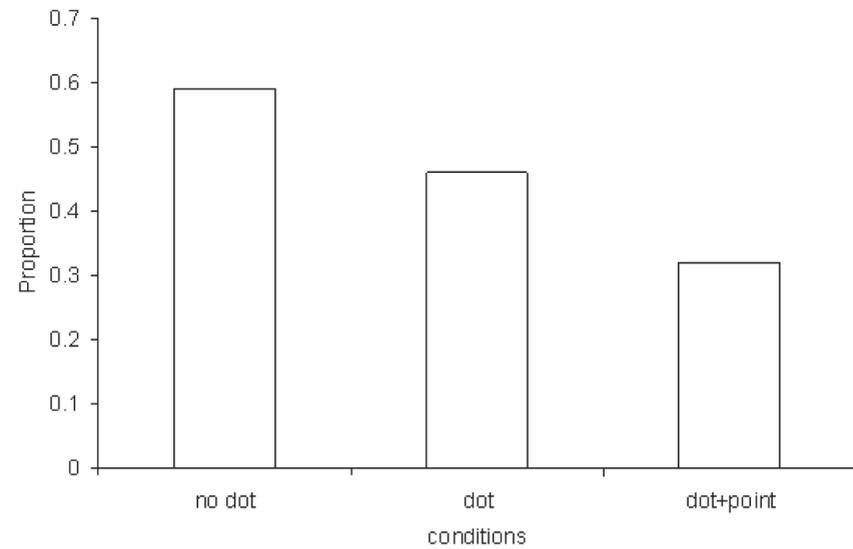


Figure 2. Mean proportion of target items recalled across conditions in the accurate location.

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