Gesture

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"... no ideas, just irritable mental gestures" (remark attr. to Lionel Trilling, NYT June 21, 2006, p. A1)

1. What is gesture?

Lionel Trilling, in this un-motto, invokes an all-too common view of gesture. The very phrase 'hand waving' suggests triviality. But let us imagine Trilling's own gesture. It would have been (we can predict) what Cornelia Müller has called the Palm Up Open Hand (PUOH)—the hand seeming to hold a 'discursive object': in fact holding Trilling's view. These kinds of gestures have been linked to the conduit metaphor—the metaphor where language or cognition is a container holding some content. The PUOH is also one of a species of gesture termed by Kendon 'gesticulation', one of several kinds of gesture he distinguished and that I arranged on 'Kendon's Continuum':

Gesticulation \rightarrow Speech-Linked \rightarrow Pantomime \rightarrow Emblems \rightarrow Sign language

Even though gesticulation is only one point on the Continuum, in storytelling, living space descriptions, academic discourse (including prepared lectures) and conversations gesticulation is the overwhelming gesture type-99%+ of all gestures-and it is the gesture offering the greatest penetration into language itself. As one moves from gesticulation to sign language, two reciprocal changes take place. First, the degree to which speech is an obligatory accompaniment of gesture *decreases*. Second, the degree to which gesture shows the properties of a language *increases*. Gesticulations are obligatorily accompanied by speech but have properties unlike language. Speech-linked gestures are also obligatorily performed with speech, but relate to speech as a linguistic segment—sequentially rather than concurrently, and in a specific linguistic slot (standing in for the complement of the verb for example). Pantomime or dumb show by definition is not accompanied by speech. Emblems such as the "OK" sign have independent status as symbolic forms. Signs in ASL and other sign languages are obligatorily not accompanied by speech, in the sense that simultaneously speaking and signing is mutually interfering for both, and the languages themselves have the essential properties of all languages.

Clearly, therefore, speech and gesticulations (but not the other points along Kendon's Continuum) combine properties that are unalike, and this combination of unalikes occupies the same psychological instant—a fact of importance for creating an imagery-language dialectic. I shall use 'gesture' rather than 'gesticulation' in the remainder of this article.

2. Simultaneous semiotic modes

Figure 1 illustrates one gesture and how it is simultaneous with co-expressive speech. The example is taken from the narration of a cartoon story (the speaker had just watched the cartoon and was recounting it from memory to a listener; instructions emphasized that the task was storytelling, without mention of gesture). The speaker was describing an event in which one character (Sylvester) attempted to reach another character (Tweety) by climbing up a drainpipe conveniently attached next to the window where Tweety was perched. He entered the pipe and traversed it on the inside—adding stealth to his effort. The speaker said "and he goes up through the pipe this time" (the illustration captures the moment at which she is saying the stressed vowel of "thróugh"). Co-expressively with "up" her hand rose upward; co-expressively with "through" her fingers spread outward to create an interior space. The upward movement and the opening of the hand took place concurrently, not sequentially, and these movements occurred synchronously with "up through," the linguistic package that carries the same meanings. The contrastive emphasis on "through," highlighting interiority, is matched by the added complexity of the gesture, the spreading of the upturned fingers. What makes speech and gesture co-expressive is this joint highlighting of the ideas of upward motion and interiority.



Fig. 1 Gesture combining entity, upward movement and interiority in one symbol.

But also note the differences. In speech, meanings are analyzed and segregated. Speech divides the event into semantic units—a directed path ("up"), plus the idea of interiority ("through"). Analytic segregation further requires that direction and interiority be combined, to obtain the composite meaning of the whole. In gesture, this composite meaning is fused into one symbol and the semantic units are simultaneous —there is no combination (meaning determination moves from the whole to the parts, not from the parts to the whole). The effect is a uniquely gestural way of packaging meaning—something like 'rising hollowness', which does not exist as a semantic package in the lexicon of English at all. Thus, speech and gesture, at the moment of their synchronization, were co-expressive but non-redundant, and this sets the stage for doing one thing (conception of the cat's climbing up inside the pipe) in two forms—analytic/combinatoric and global/synthetic.

3. Properties of Gestures

3.1. The 'unbreakable speech-gesture bond'

Synchronized speech and gesture comprise virtually unbreakable psycholinguistic units; unbreakable, as long as speech and gesture are co-expressive. A diverse range of phenomena show the inseparability of the two modes; Table 1 summarizes some of them. In each case, some disruption to speech-gesture combination is resisted; it holds despite the disruption. To break this bond one has to drain the combination of meaning—e.g., through rote repetition.

| Domain | Phenomenon |
|----------------------|---|
| DAF | Does not disrupt speech-gesture synchrony |
| Stuttering | Gesture stroke onsets resist stuttering; stuttering cancels on- going strokes |
| Blindness | Gestures occur when speaking to other blind known as such |
| Fluency | Speech and gesture are complex or simple <i>in tandem</i> |
| Information exchange | Information seen in gesture recalled as speech, and vice versa |

Table 1. Gesture-Speech Binding Resists Interruption

3.2. Gesture anatomy

This anatomy is temporal, a regular succession of phases: preparation, prestroke hold, stroke, poststroke hold, and retraction, of which only the stroke is obligatory.

3.3. Phases and their significance.

Gesture phases are organized around the stroke, everything is designed to present it in proper synchrony with its co-expressive speech segment(s). Figure 1 shows all gesture phases except retraction. The full span, from the beginning of preparation to the end of retraction, brackets what can be thought of as the lifetime of a specific idea unit in language-geared imagery. We see the image in a state of activation that did not exist before and does not exist after this span. The dawn of the idea unit is seen in the beginning of the preparation, and the idea unit itself is the unit formed of the synchronized co-expressive speech and stroke (called a 'growth point').



Fig. 2 Phases of a gesture timed with "and he bends it way back". The insert is a frame counter (1 frame = 1/30 sec.). The total elapsed time is about 1.5 secs.

Panel 1. Preparation.

Panel 2. Prestroke hold while saying "he".

Panel 3. Middle of stroke—"bends it way ba(ck)".

Panel 4. End of stroke and beginning of the poststroke hold in the middle of "back".

4. When do gestures occur?

Somewhat surprisingly, the timing of gestures in relation to speech has been the subject of controversy. The question is: Do gestures tend to anticipate their linked linguistic material, or do they coincide with it? The anticipation view is often accompanied by a further idea—that gestures take place during speech pauses. The synchrony view, clearly, implies that gestures and speech are co-occurring. When the question is examined with careful attention to the distinction between preparation and stroke, the facts are clear: The *preparation* for the gesture precedes the co-expressive linguistic segment (with a pause or not); the *stroke* coincides with this segment, about 90% of the time. Holds ensure that synchrony is preserved.

5. Types or dimensions of gestures

Systems for classifying gestures have been proposed for decades. Drawing inspiration from C. S. Peirce, Elena Levy and I used 4 'categories' (now dimensions) that

accommodated more than 90% of the gestures we observed in narrative discourse: iconic, metaphoric, deictic (including abstract pointing), and beats. However, most gestures are multifaceted—iconicity is combined with deixis, deixis with metaphoricity, and so forth. The gesture in Fig. 1 was iconic and also deictic, in that the locus of the event (at the bottom of a drainpipe) was indicated by positioning the iconic elements in the lower gesture space. Rather than categories one should think in terms of dimensions on which a gesture has loadings. One benefit of shifting to a dimensional framework is that coding is simplified.

6. Gesture and sign language

Scott Liddell has presented a conception of ASL as a linguistic system that places gestures at the heart of the language. Sign languages are conventionalized, with a morphology of citable forms and a syntax (utilizing space as the linguistic medium). Liddell cites pronouns and directional verbs (*give, see, talk to,* and the like) as the prime cases of a gesture-sign interface. These ASL forms have implicit slots into which deictic-iconic gestures must go, as a requirement of form. The slots are part of the grammatical structure, but the gestures that enter them are non-morphemic, graded, and unlistable. Other gestures with iconicity may also blend with conventional signs, thus in one sign both a spontaneous and a conventional kind of imagery coexist. Susan Duncan observes that spontaneous imagery appears as a 'distortion' of a standard sign, yet occurs at the same points in narrations where hearing speakers produce gestures, so possibly is iconic gesture in sign as well.

7. Discourse and social interaction

Perhaps the most significant intersection of gesture with language is in discourse and social interaction.

7.1. Gesture and communicative dynamism

The gesture in Fig. 1 was the second this speaker had performed for Sylvester's ascent of the pipe. In the cartoon, Sylvester attempts to climb the pipe twice, first on the outside, as a kind of ladder, second on the inside, the version in Fig. 1. The outside gesture by this speaker, just before Fig. 1, had been free of pipelike features; it was pure ascent. The Fig. 1 gesture thus exhibited precisely what, in the immediate context, was distinctive—interiority—and in this way created communicative dynamism. Narrators who leave out the outside attempt, due to error, but do mention the inside ascent, tend not to include interiority. The *fact* of interiority is not sufficient; the gesture is sensitive to the *distinctiveness* of this information in the discourse context. Co-expressive speech and gesture synchronize at points of high communicative dynamism (Duncan and Loehr are currently testing this hypothesis experimentally).

7.2. Two hands

Gestures also code discourse frames by use of the second hand. A two-handed gesture can initiate a discourse segment in which one hand depicts events while the other hand maintains the shape and/or location it had in the launching gesture, and this frames the event in the coninuing context. ASL exploits this device for discursive cohesion.

7.3. Catchments

A further concept provides an empirical route for finding the context within which an idea unit is differentiated. A catchment comprises multiple gestures with recurring form features, and exposes the discourse segment to which a growth point belongs (the use of two hands for discourse frames comprises a catchment, but cachments are formed in a wide variety of ways). Catchments offer a second insight for linguistics: discourse itself takes on imagery form.

7.4. Social interaction

In addition to discourse, gestures are sensitive to the social-interactive context of the speakers. Asli Özyürek showed that changing the number and the spatial loci of listeners has an effect on the speaker's gestural imagery. Janet Bavelas has pioneered the study of a class of gestures she terms 'interactive'—gestures whose significance lies in structuring and management of social interactions without yielding control of the floor. Along similar lines, gesture mimicry and joint speaker-listener gesture production cement social interactions. In roundtable discussions, gestures participate in turn-taking and speaker dominance. Gestures with an interactive focus are not discontinuous from gestures relating to idea units. On the contrary, they exhibit continuity with ideas, as envisioned by Vygotsky.

8. The origin of language

The 'gesture-first' theory of language origin holds that the first form of language consisted largely of gestures, to be later supplanted by speech—an idea going back to Condillac in the 18th Century. Gesture-first has attracted much interest in recent years. A difficulty, however, is that it 'predicts' the wrong gestures. The initial gestures would have been speechless pantomimes, nonverbal actions with narrative potential, not the gesticulations that synchronize with, and dialectically oppose, speech at the far end of Kendon's Continuum. Pantomime may indeed have evolved but, if so, it did not lead to the evolution of speech and gesture *units* (growth points). Such units would likely have had their own adaptive value. An implication is that different evolutionary trajectories landed at different points along Kendon's Continuum, reflected today in different forms and timing patterns with speech.

Further reading

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