Gesenius also published works on other Semitic languages than Hebrew, such as *Versuch über die Maltesische Sprache* (1910), *Palaeographische Studien über phoenizische und punische Schrift* (1835), *Scripturae linguaeque phoenicia monumenta quotquot supersunt edita et inedita* (1837).

See also: Hebrew, Israeli; Semitic Languages.

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Gesture and Communication

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As a field of study, gesture has become energized in recent years. There is now an organization (International Society for Gesture Studies) and a journal (*GESTURE*, founding editors Adam Kendon and Cornelia Müller). In preparing this article, I have aimed to balance the empirical basics of gestures with a theoretical perspective from which to regard gestures and see what insights they bring to an understanding of the nature of language.

The word 'gesture' covers a multiplicity of communicative movements, primarily but not always of the hands and arms. Often, gestures are assumed to comprise a channel distinct from speech, but careful investigation challenges this traditional view. Gestures and language are best thought of as a single system, larger than either language or gesture as traditionally assumed. It will be useful to begin our survey by drawing distinctions among different actions, all of which might be termed 'gesture.'

Kendon's Continuum

Adam Kendon once distinguished gestures of different kinds along a continuum that I named 'Kendon's Continuum,' in his honor (McNeill, 1992). The gestures we are mostly concerned with are the 'gesticulations.' See McNeill (1992) for details.

'Gesticulation' is motion that embodies a meaning relatable to the accompanying speech. Gesticulation is by far the most frequent type of gesture in daily use and it covers many variants and usages. It is made chiefly with the arms and hands but is not restricted to these body parts – the head can take over as a kind of third hand if the anatomical hands are immobilized or otherwise engaged, and the legs and feet too can move in a gesture mode. In a large sample of gestures, Shuichi Nobe found that the stroke phase of the gesticulation is synchronous with the coexpressive speech about 90% of the time (gesture phases are defined below). When strokes are asynchronous, they slightly precede the speech to which they link semantically, usually because of brief hesitations, and the time gap is small. Gesticulations rarely if ever follow their coexpressive speech (Kendon, 1972). There is no basis for the assertion that strokes occur during hesitations. Such a view has attainted urban legend status, but it is based on a misrepresentation of the original study by Brian Butterworth and Geoffrey Beattie (Butterworth and Beattie, 1978). They reported that the rate of gesture occurrence was higher during speech pauses than phonations. However, far more gestures occur during phonation than pauses, so the 90% figure is the result (Nobe also did not replicate their higher gesture rate during pauses, possibly because of different communicative situations: Nobe was looking at narrations, while Butterworth and Beattie had analyzed college tutorials, where gestures during pauses are likely to have had 'turn suppression' functions not prominent in narrations). The expression 'coexpressive speech and gesture' is explained below. Other controversies have revolved around the issue of whether gesticulations are communicative – 'made for the listener' – or beneficial primarily for speech production – 'made for the speaker' (cf. Krauss *et al*., 2000; Alibali *et al*., 2000). Gesticulations combine both universal and language-specific features. Speakers of every language studied thus far (and this is a sizable list: in our lab alone, English, Japanese, Mandarin [Mandarin Chinese], Korean, Spanish, French, German [Standard German], Italian, Turkish, Georgian, Russian, American Sign Language, Taiwanese Sign Language, and a few African languages) produce them, and the gesticulations for the same events in a cartoon stimulus show clear similarities across these languages. Yet there are also striking differences which are traceable

to characteristics of the languages the gestures are cooccurring with, in particular whether the language is, in Leonard Talmy's typology (Talmy, 2000), S-type or V-type (see McNeill and Duncan, 2000). Gesture space is oriented in terms of absolute compass direction by speakers of Guugu Yimithirr (Guguyimidjir) (an Aboriginal language with obligatory absolute orientation in its verb morphology) and also by speakers of Tzotzil (a Mayan language that lacks the lexical precision of directional reference as seen in Guugu Yimithirr [Guguyimidjir], but whose mode of living promotes exact spatial orientation, which is then embodied in gestures; see Haviland, 2000).

'Speech-framed gestures' are part of the sentence itself. The term is from Karl-Erik McCullough. Such gestures occupy a slot in a sentence, e.g., 'Sylvester went [gesture of an object flying out laterally],' where the gesture completes the sentence structure. These gestures time differently from gesticulations – they occupy a gap that fills a grammatical slot, rather than synchronizing with speech that is coexpressive.

'Emblems' are conventionalized signs, such as thumbs up or the ring (first finger and thumb tips touching, other fingers extended) for 'OK,' and others less polite. Kendon prefers the term 'quotable gesture,' referring to a potential for a more or less complete verbal translation – 'OK' translating into terms of approbation, for example. Emblems or quotable gestures are culturally specific, have standard forms and significances, and vary from place to place. Kendon (1995) has for some years studied the gesture culture of Naples, a locale with an exceptionally rich repertoire of quotable gestures (cf. de Jorio, an early 19th-century figure, in Kendon, 2000). These gestures are meaningful without speech, although they also occur with speech. They function like illocutionary force markers, rather than propositions, the mode of gesticulation, and the timing when they occur with speech, being quite different. A single Neapolitan emblem for 'insistent query' (the 'purse' or *mano a borsa*: prototypically, the hand palm up, the fingers and thumb loosely bunched together at the top, and rocking up and down) was observed in one case stretching over several utterances and then continuing into the next speaker's turn, still demanding clarification. This gesture is not employed in North America (a similar-looking gesture is used to mean that something is 'precisely so'), which illustrates the cross-cultural variation of the emblem. Emblems can blend both sequentially and simultaneously with gestures of other kinds. Many emblems have deep historical roots, far outlasting the spoken languages with which they occur. Some go back to Roman times (Morris *et al*., 1979), including the infamous 'finger,' beloved of the American road – it would have been understood by Julius Caesar. Most emblems have iconic or metaphoric components. The contact of the thumb and forefinger in the 'OK' sign captures the idea of precision. But the emblem is also specified by a convention pairing the form of the gesture to the approbation meaning. The fixity of the emblem is the evidence of this. Putting the *second* finger in contact with the thumb is still precision but no longer is the 'OK' sign of approbation.

'Pantomime' is dumb-show, a gesture or sequence of gestures conveying a narrative line, with a story to tell, produced without speech. And at the other extreme of the continuum, 'signs' are lexical words in a sign language such as ASL. Sign languages have their own linguistic structures, including grammatical patterns, stores of words, morphological patterns, etc. The linguistic code of ASL is quite unlike that of English. Sign languages have evolved without the requirement of being coordinated with speech. In fact, hearing signers find producing speech and signs simultaneously to be disruptive to both. For an authoritative description, see Liddell (2003).

As one moves along Kendon's continuum, two kinds of reciprocal changes occur. First, the degree to which speech is an obligatory accompaniment of gesture *decreases* from gesticulation to signs. Second, the degree to which a gesture shows the properties of a language *increases*. Gesticulations are obligatorily accompanied by speech but have properties unlike language. Speech-framed gestures are also obligatorily performed with speech, but relate to speech in a different manner – sequentially rather than concurrently, and in a specific linguistic role. Signs are obligatorily *not* accompanied by speech and have the essential properties of a language. Clearly, therefore, gesticulations (but not the other points along Kendon's continuum) combine properties – gesture with language – that are unalike, and this combination occupies one communicative instant. A combination of unalikes, at the same time, is a key psycholinguistic fact and a framework for an imagery–language dialectic. The remainder of this article focuses on gesticulations. If no ambiguity results, from here on I shall use the simpler term 'gesture.'

Traditions of gesture study not summarized in this article because of length are gestures of the theater (Fischer-Lichte, 1992), histories of gesture studies (Bremmer and Roodenburg, 1991), 'neurogestures' (McNeill, 2005), gestures in human–computer interface design (Kita *et al*., 1998), methods of gesture transcription and measurement (Quek *et al*., 1999), and the gestures of children (Bates and Dick, 2002), including home signs (Goldin-Meadow, 2003).

The Iconic, Metaphoric, Deictic, Beat Quartet

These categories or, as I will later say, dimensions are inspired by the semiotic categories of C. S. Peirce. Elena Levy and I proposed a classification scheme with four categories: iconic, metaphoric, deictic, and beat. All are gesticulations or speech-framed gestures on Kendon's continuum.

Iconic: Such gestures present images of concrete entities and/or actions. For example, appearing to grasp and bend back something while saying "and he bends it way back." The gesture, as a referential symbol, functions via its formal and structural resemblance to event or objects.

Metaphoric: Gestures are not limited to depictions of concrete events. They can also picture abstract content, in effect imagining the non-imageable. In a metaphoric gesture, an abstract meaning is presented as if it had form and/or occupied space. For example, a speaker appears to be holding an object, as if presenting it, yet the meaning is not presenting a concrete object but an idea or memory or some other abstract 'object' (for examples, see McNeill, 1992; Cienki, 1998). This is a gestural version of the conduit metaphor that appears in expressions such as 'he packed a lot into that lecture,' where the lecture is presented as a container and the message as its contents (Lakoff and Johnson, 1980). Recent work on metaphoric gestures has greatly expanded the subject. Müller (2004) developed a new theory of metaphor as a dynamic process (whereby 'sleeping' metaphors are 'awakened' in context) in which metaphoric gestures play an essential part. Parrill and Sweetser (forthcoming) develops a new theoretical account based on 'mental spaces blending theory.' Metaphoric gestures often indicate that the accompanying speech is meta rather than object level – for example, saying "the next scene of the cartoon" and making a conduit cup of meaning gesture (iconic gestures, in contrast, favor the object level).

Deictic: The prototypical deictic gesture is an extended index finger, but almost any extensible body part or held object can be used. Indeed, some cultures prescribe deixis with the lips (Enfield, 2001). Deixis entails locating entities and actions in space *vis-à-vis* a reference point, which Karl Bühler called the 'origo' (Bühler, 1982; Haviland, 2000). Much of the pointing we see in adult conversation and storytelling is not pointing at physically present objects or locations but is abstract pointing, which Bühler referred to as "deixis at phantasma." The emergence of abstract pointing is a milestone in children's development. In striking contrast to concrete pointing, which appears before the first birthday and is one of the initiating events of language acquisition, abstract pointing is not much in evidence before the age of 12 and is one of the concluding events (McNeill, 1992).

Beats: Such gestures are so called because the hand appears to be beating time. Other allusions to the musical analogy use the term 'baton' (Efron, 1941). As forms, beats are mere flicks of the hand(s) up and down or back and forth, zeroing in rhythmically on the prosodic peaks of speech. This rhythmicity has made beats seem purely speech related. However, they also have discourse functionality, signaling the temporal locus of something the speaker feels to be important with respect to the larger context. One can think of a beat as a gestural yellow highlighter.

With these four categories, Levy and I were able to classify nearly all gestures in the narrative materials we collected. Other researchers have proposed more finely subdivided categories.

Dimensions Rather than Kinds

I wish to claim, however, that none of these 'categories' is truly categorical. We should speak instead of *dimensions* and say: iconicity, metaphoricity, deixis, 'temporal highlighting' (for beats), social interactivity, or some other equally unmellifluous (but accurate) terms conveying dimensionality.

The essential clue that these are dimensions and not categories is that we often find iconicity, metaphoricity, deixis, and other features mixing in the same gesture. Beats often combine with pointing, and many iconic gestures are also deictic. We cannot put them into a hierarchy without saying which categories are dominant, and in general this is impossible. A practical result of dimensionalizing is improvement in gesture coding, because it is no longer necessary to make forced decisions to fit each gesture occurrence into a single box.

Tight Binding

The temporal binding of speech and gesture is almost impervious to forces trying to interrupt it. The very heterogeneity of the following observations shows the inviolability of the speech–gesture unit (see McNeill, 2005 for details).

Gesture synchrony and DAF: Delayed auditory feedback or DAF has a dramatic effect on the flow of speech, which slows down, becomes hesitant and is subject to drawling and metatheses (spoonerisms). Nonetheless, despite the interruptions, speech and gesture remain in synchrony.

Gesture inoculates against stuttering: Mayberry and Jaques (2000) made two noteworthy observations. First, the onset of a gesture stroke inoculates against the onset of stuttering. Second, if stuttering

begins *during* a stroke, the speaker's hand freezes in midair and may fall to rest. In both observations, we see an incompatibility between the interruption of speech in stuttering and the occurrence of the meaningful gestures.

Gestures of the blind: Congenitally blind speakers, who have never observed gestures, nonetheless do gesture and do so as frequently as sighted subjects, and gesture even when they know are talking to another blind person (Iverson and Goldin-Meadow, 1998). This is dramatic evidence of a speech – gesture bond.

Information exchange: Information received in a gesture may be recalled later as speech (not gesture) (Cassell *et al.*, 1999). Symmetrically, Kelly *et al.* (1999) observed subjects recalling information presented in speech as having been gestural.

Gestures and fluency: Speech and gesture become complex or simple in tandem, even to the point of jointly disappearing (the gesture disappears along with speech, rather than replacing it).

To sum up binding, speech and synchronous coexpressive gestures form a tightly bound unit, capable of resisting outside forces attempting to separate them, such as DAF, stuttering, lack of visual experience of gesture, and loss of fluency. Speech and gesture also spontaneously exchange information in memory, so that when something is recalled the speaker cannot tell the original format. Tight binding clearly fosters an imagery–language dialectic by creating unbreakable psycholinguistic units within which it can take place.

Gesture Anatomy

The anatomy in question is temporal, an anatomy of 'phases.' The gesture illustrated in Figure 1 includes all phases except a final, retraction phase, which did not occur in this case because a new gesture followed immediately. The speaker had been given a comic book to read and was retelling the story to a listener from memory. The transcription, by S. Duncan, is as follows: "so he gets a / hold of a big [oak tree / and he **bends it way ba**ck]." Notation: / denotes a silent pause; [the onset of motion; underlining a hold; boldface the stroke;] the end of motion.

Unfolding in Time and Its Meaning

As this example illustrates, gestures pass through a series of phases, each with its own position and function in the gesture. The phases enable us to peer into performance dynamics. Kendon (1980) differentiated among what he termed "gesture units," "gesture phrases," and "gesture phases."

A gesture unit is the interval between successive rests of the limbs. In the example, the gesture unit

Figure 1 Gesture phases in the 'and he bends it way back' gesture. The insert is a frame counter (1 frame = 1/30 s.). The total elapsed time is about 1.5 s. Panel 1: Prepreparation position. Hand is shown just prior to lifting off from the armrest. Panel 2: A Prestroke hold occurs while saying 'he' – the hand waiting for 'bends.' This figure depicts the hand at the start position of the stroke (ready to pull down and to the rear). The preparation interval was slightly less than 1 s. Panel 3: Middle of stroke – 'way.' The hand has closed around the 'oak tree' and is moving downward and to the rear. Note how the speaker's own position in space defines the location of the oak tree and the direction of the bending-back movement – the gesture framed according to a 'first-person' or 'character' viewpoint. Panel 4: End of stroke and beginning of the poststroke hold in the middle of 'back.' Hand is at its farthest point to the rear. After the poststroke hold, the hand immediately launched into a new gesture.

included not only the interval from 'oak' to 'back,' but also further speech and later gestures not shown.

A gesture phrase is what we intuitively call a 'gesture' and it in turn consists of up to five gesture phases, in sequence:

- Preparation (optional): The limb moves away from a rest position into the gesture space, where it can begin the stroke. The onset of preparation shows the moment at which the visuospatial content of the gesture starts to take form in the cognitive experience of the speaker. 'Oak tree and' coincided with the preparation phase in the illustration, and it is noteworthy that the preparation commenced with the first mention of the object in the preceding clause – as the idea was introduced, so the next image flicked on to become a gesture.
- Stroke (obligatory in the sense that, without a stroke, a gesture is not said to occur): The stroke is the gesture phase with meaning; it is also the phase with effort, in the dance notation sense of focused energy. In the example above, the stroke was the bending back, the hand in a grip around something thick, timed with the coexpressive 'bends it way back.'
- Retraction (optional): The hands return to rest (not always the same position as at the start). There may not be a retraction phase if the speaker immediately moves into a new stroke, as was the case in the illustration.

In addition, Sotaro Kita identified:

- Pre- and poststroke hold phases (optional): Temporary cessations of motion either before or after the stroke motion; in the example a prestroke hold occurred during 'he' and a poststroke hold during the second half of 'back'; holds ensure that the meaningful part of the gesture – the stroke – remains semantically active during the coexpressive speech. Holds suggest that the stroke and the coexpressive speech comprises an idea unit created in advance, from the start of the preparation phase.

The gesture phases are organized around the stroke. This is the 'object' being presented. It is prepared for, withheld if need be until the coexpressive speech is ready, and held again until all linked speech is over. The full span of phases, from the beginning of preparation to the end of retraction, describes the lifetime of a particular gesture and its linked idea unit.

Coexpressiveness and Synchrony

Gesticulations (but not other points along Kendon's continuum) have the property that strokes synchronize with coexpressive speech. This section explains this concept. An example is illustrated in Figure 2. The speaker was describing a cartoon episode in which one character tries to reach another character by climbing up a drainpipe on the inside. The speaker is saying "and he tries going **up thróugh** it this time," with the gesture occurring during the boldfaced portion (the illustration captures the moment at which the speaker is saying the vowel of 'through'). Coexpressively with 'up' her hand rose upward, and coexpressively with 'through' her fingers spread outward to create an interior space. The upward movement and opening of the hand took place simultaneously, and both were synchronized with 'up through,' the linguistic package that carries the same meanings. The effect is a uniquely gestural way of packaging meaning – something like 'rising hollowness,' which does not exist as a semantic package of English at all. The gesture and the linguistic construction synchronize as a whole, not component by component. Thus, speech and gesture synchronize at the point where they are coexpressive and this, not the components, is the unit that aligns them.

Growth Points and Context

Synchronous combinations of such unlike modes of cognition – visuospatial-actional gesture synchronized with analytic-combinatoric speech – may be operative psycholinguistic units, termed 'growth points' or GPs (McNeill and Duncan, 2000). One way to think of a GP is as imagery that is categorized linguistically, an image with a foot in the door of language. A GP is inferred from the totality of communicative events, with special focus on speech–gesture synchrony and coexpressivity. It is called a growth point because it is meant to be the

Figure 2 Synchronous, coexpressive gesture with 'up thróugh.' Accent indicates a stressed vowel.

initial form of a thinking-for-speaking unit out of which a dynamic process of utterance and thought organization emerges.

The Psychological Predicate Regarding the GP as a psychological predicate (a term from Vygotsky, 1986 – not always a grammatical predicate) suggests a mechanism of GP formation in which differentiation of a focus from a background plays an essential part.

The concept of a psychological predicate illuminates the theoretical link between the GP and the context of speaking. Defining a psychological predicate requires reference to the context; this is because the psychological predicate and its context are mutually defining. The psychological predicate (1) marks a significant departure in the immediate context, and (2) implies this context as a background. We have in this relationship the seeds for a model of real-time utterance generation and coherent text formation.

First, when gestures and speech synchronize they jointly form the contrast underlying a psychological predicate. Second, the form of the gesture embodies the content that makes this differentiation meaningful. These correspondences can be demonstrated by exploiting a quirk in the cartoon stimulus that we have employed, in which Sylvester attempts to reach Tweety by climbing a drainpipe conveniently running up the side of the building from street level to the floor where Tweety is perched; he does this twice – first on the outside of the pipe, then on the inside. If a speaker recalls both attempts and in the correct outside-inside order, the gesture–speech combination relating to the second attempt includes a focus on interiority; this is the differentiating element. If a speaker misses the outside attempt but does recall the inside attempt, or recalls them in reverse order, interiority does not now contrast with exteriority, and the gestures with such recall do not include it as a particular feature. These results have been reported by Susan Duncan at workshops; I summarize them, with illustrations, in McNeill, 2005.

Contexts and Catchments

The context of differentiation is an empirically approachable concept via gestures that organize themselves into 'catchments.' A catchment is recognized when one or more gesture features recur in at least two (not necessarily consecutive) gestures. The logic is that a discourse theme will produce gestures with recurring features. These gesture features can be detected. Then, working backwards, the recurring features offer clues to the cohesive linkages in the text with which they co-occur. A catchment is a kind of thread of visuospatial imagery that runs through a discourse to reveal the larger discourse units that emerge out of otherwise separate parts. The recurring features can include hand use (right hand, left hand, two hands similarly deployed, two hands differently deployed), space, orientation, trajectory, hand shape and position, and others, although these are the most common.

By discovering the catchments created by a given speaker, we can see what this speaker is combining into larger discourse units – what meanings are being regarded as similar or related and grouped together, and what meanings are being put into different catchments or are being isolated, and thus are being seen by the speaker as having distinct or less related meanings.

Viv's Catchments I shall use one speaker's recounting of an episode from the cartoon stimulus to demonstrate catchments and how they can be used to imply something of the dynamic process of utterance formation.

The episode involves a bowling ball, and follows directly the ascent inside the drainpipe described earlier. Tweety, seeing Sylvester, fetches a bowling ball and drops it into the top of the pipe; the ball and Sylvester meet in the middle; Sylvester shoots out of the bottom of the pipe, the bowling ball now inside him; he rolls, bowling ball style, down an inclined street and into a bowling alley; after a significant pause, there is the sound of pins being knocked over.

Viv's gesture performance reveals three catchments, recognizable from hand use and hand shape/position:

C1. The first catchment involves one-handed gestures, and accompanies descriptions of Sylvester's solo motion, first up the pipe, then out of it with the bowling ball inside him. Thus, C1 ties together references to Sylvester as a solo force.
C2. The second catchment involves two-handed symmetrical gestures that group descriptions where the bowling ball is the antagonist, the dominant force. Sylvester becomes what he eats, a kind of living bowling ball, and the symmetrical gestures accompany the descriptions where the bowling ball asserts this power.
C3. The third catchment involves two-handed asymmetrical gestures and groups items in which the bowling ball and Sylvester mutually approach each other in the pipe. Here, in contrast to the symmetric set, Sylvester and the bowling ball are equals differing only in their direction of motion.

With these catchments, we can analyze the real-time origins of the utterance and gesture in the accompanying example, in a way that incorporates context as a fundamental component. The illustrated example is in the symmetrical C2, which shows that

Figure 3 Downward stroke with '**it do**wn.'

Figure 4 Gestural mimicry. First panel is a gesture by the speaker to the right; second panel is mimicry by the speaker to the left.

one of the factors comprising its field of oppositions was the various guises in which the bowling ball appeared in its role of an antagonist. That is, the idea unit was not only dropping the bowling ball but the bowling ball as a force in its own right. We can write the meaning of the psychological predicate as 'Antagonistic Force: Bowling Ball Downward.' This was the context and contrast. Thus, 'it down' (see Figure 3), unlikely though it may seem as a unit from a grammatical point of view, was the cognitive core of the utterance – the 'it' indexing the bowling ball, and the 'down' indexing the significant contrast itself in the field of oppositions. And the verb 'drops,' therefore, was *excluded* from this GP; it referred to something Tweety did, not what the bowling ball, as a force, did.

Viv's gesture in Figure 3 was made with two symmetrical hands – the palms loosely cupped and facing downward as if placed on top of a large spherical object, and the hands moved down during the linguistic segments 'it down.' The inferred GP is this image of downward movement plus the linguistic content of 'it' (i.e., the bowling ball) and the path particle 'down.' The stroke *excluded* the verb, 'drops.' The full utterance was "Tweety runs and gets a big bowling ba[ll and drops **it do**wn the drainpipe #]."

The exclusion of 'drops' was not an accident. First, the preparation phase of the 'it down' gesture had two features that skip the verb. Preparation began at the first mention of the bowling ball in the preceding clause (again, preparation for the next gesture began with the object was first mentioned). This shows that the bowling ball was part of the discourse focus at that moment. And, second, preparation continued right *through* the verb, suggesting that the verb was irrelevant to this focus. Further, a brief prestroke hold seems to have preceded 'it down' (although coding varies), which, if present, targeted the stroke to 'it down.' Finally, a poststroke hold lasted exactly as long as it took to complete the spoken articulation of 'down,' which preserved the synchrony of the gesture and the word. So the stroke fully and exactly timed with just two words, 'it down,' and excluded a third, 'drops.' The rest of the utterance can be explained by 'unpacking' this GP via a construction (in this case, the caused motion construction, which provided the verb 'drops' as well as the ground element, 'the drainpipe'; cf. McNeill and Duncan, 2000).

Social Context

Lev Vygotsky, in his argument against Jean Piaget, famously asserted that everything appears in a child's development twice: first on the social plane, later on the psychological (Vygotsky, 1986). The concept of a social-to-psychological transition can be applied to gestures as well. Gestures imply a social other. If one denies access to a listener, the frequency of gesture declines (Alibali *et al.*, 2000). Increasing the number of listeners changes the shape of the gesture space and this in turn changes the direction of gestures depicting movements of characters in the story (Özyürek, 2000).

I shall conclude with examples of the social sharing of gestures. The research from which they are drawn is not yet published, but the phenomenon of social sharing or resonance through gesture is significant.

Mimicry and Two-Bodied Gestures Gestural mimicry occurs when one conversational partner, within a short time, reproduces the gesture of the other partner; the effect is often to cement a kind of social solidarity and is accordingly seen commonly between close friends. The example in Figure 4 from research by Irene Kimbara shows the woman on the

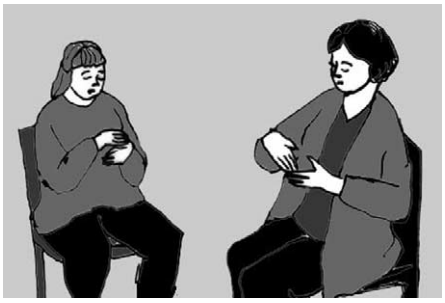

Figure 5 Gesture mimicry synchronized with the other's speech.

Figure 6 Gesture appropriation synchronized with the person's own speech.

left reproducing the gesture just performed by her friend on the right.

A different kind of shared gesture is also possible between strangers. Figures 5 and 6 are from Nobuhiro Furuyama, who studied the gestures of learners as they were instructed in a new motor task (origami). In each illustration, the learner is seated at the left (two different training sessions). In the Figure 5 example, the learner mimics the gesture of her tutor. The mimicry occurred without speech by the learner, but her *gesture* synchronized with the *tutor's speech*. As the tutor said "[pull down] the corner," the learner performed the gesture during the bracketed portion. The Figure 6 example, in contrast, shows the learner appropriating the tutor's *gesture* by combining it with her *speech*. The learner is saying "[you bend this down?]," and during the bracketed speech moved her hand to the tutor's hand, and then moved her hand downward and away (the illustration shows the start of the gesture). As Furuyama observes, the tutor had turned in his chair so that the same left–right gesture space was before him and the learner, a maneuver that might have invited her to enter his gesture space. It is striking that any taboo against strangers coming into physical contact was overridden while the hands were in a symbolic mode.

Examples of these kinds address what can be called collectively the 'social resonance' of gesture. Janet Bavelas has long been interested in this phenomenon. Bavelas *et al*. (2000) demonstrated resonance not from the viewpoint of shared feelings, the more traditional approach, but as joint cognition and storytelling; gestural repetition seems to act as grounding and in general conveys mutual understanding.

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See also: Body Language; Cognitive Linguistics; Coherence: Psycholinguistic Approach; Cohesion and Coherence: Linguistic Approaches; Discourse Anaphora; Discourse Processing; Figurative Language: Semiotics; Figures of Speech; Foregrounding; Gesture: Sociocultural Analysis; Gestures: Pragmatic Aspects; Iconicity: Literary Texts; Iconicity: Sign Language; Meaning, Procedural and Conceptual; Metaphor: Psychological Aspects; Metapragmatics; Narrativity and Voice; Pauses and Hesitations: Psycholinguistic Approach; Sentence Processing; Sign Language: Discourse and Pragmatics; Sign Language: Overview; Sign Language: Psycholinguistics; Spoken Language Production: Psycholinguistic Approach; Syntactic Constructions; Word and Image.

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Gesture: Sociocultural Analysis

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Gesture is Integrated with Utterance

When people come together to interact, they can exploit everything at hand (as we might say) to communicate with one another. They position their bodies in relation to both interlocutors and other copresent people; they manipulate objects in the surround; they orient their senses towards one another; they talk; they look; they listen; and they gesture – they move their bodies (and sometimes other entities as well) as part of interaction. Although this short article concentrates on gestures, mostly those performed with the hands, that form part of spoken utterances, much of what it describes could be extended to a wider range of 'gestural expression,' whether or not linked directly to speech, and including a variety of body parts (head, eyes, face, torso) and corporal techniques.

The keenest observers of human communicative capacities have always been interested in gesture.

Consider the expressive postures of clay or stone figurines from Palenque to Phnom Penh, or the fingers, hands, arms, faces, and bodies of human figures depicted on vases, walls, textiles, shields, masks, and canvases from Auckland to Greenland, or captured in snapshots and sketches from New York to New Guinea. Quintilian, the 1st-century Roman rhetorician, offered a treatise on how to use gesture artfully as part of oratorical persuasion. Grand speculative programs in the 18th and 19th centuries – programs which continue in perhaps less ambitious and explicit forms to the present day – found in gesture evidence for presumed universals in thought and language. Conversely, explorations of human diversity – especially in the 20th century – also found in gesture a fertile empirical ground to demonstrate divergence and cultural specificity. Important here was the rise of iconic recording technologies which allowed observers to reduce fleeting gestural performances to representation which could be indefinitely replayed and scrutinized for analysis. There is a related tension, in both pretheoretical and analytic fascinations with gesture, between nature and culture: between speech-accompanying gesticulation cast as 'pantomime,' 'protolanguage,' or 'natural pidgin' somehow grounded in presumed panhuman iconicity and expressivity, vs. the unpredictable culturally specific repertoire of gestures that clearly must be conventionally learned, used, and understood, and that remain opaque to non-natives. (Some Los Angeles natives perform an L-shaped hand on their foreheads to mean 'loser,' i.e., to indicate that some third person is a poor excuse for a human being – a gestural convention perhaps no less exotic that the Neapolitan 'hunger' or 'poor' gesture performed with a slapping motion toward the hip – see Kendon, 1992. The 'loser' gesture exists as an animated emoticon on at least one Internet instant messenger service.)

Contrasting bodily movements with other aspects of the utterances of which they form part, the expressive virtues of gesture both complement and differ from those of the digital, segmentable, and structurally contrastive elements of spoken language. Since it uses as an expressive medium the very body that is involved in human action in the first place, gesture can model action both directly and analogically. Even highly stylized pantomimes can illustrate aspects of action not verbally expressed, nor indeed easily expressible: complex configurations of objects and actors, perspectives, details of mechanics and effort in action. Contrasting with the linear flow of speech units, gesture unfolds in four dimensions, and easily combines multiple simultaneous signing vehicles (gaze, facial expression, posture, as well as hands and other extremities) in a miniature and multifunctional orchestra of expression. Utilizing space as well as time, gesture has a dimensionality, a potential persistence, and a spatial immediacy in the context of utterance not similarly available to sound. For example, a gesture can be held across a chain of utterances, thus providing a diagrammatic vehicle to anchor talk; or it can incorporate into a scene spatial elements – such as direction, distance, size, or shape – which receive no corresponding verbal expression.

Nonetheless, gesture and speech characteristically occur together, combining with still other expressive resources to coordinate interlocutors in the communicative process, and often with precise temporal and semantic coordination. Emblems – the culturally specific, learned gestural forms, with usually quite specific conventional readings, like an 'OK hand' or a locally defined obscene gestural imprecation – can cooccur with speech or, perhaps more often, simply replace it, even in the midst of conversational turns. They are thus a kind of language surrogate. Other sorts of gesture, however, seem to be inextricably linked to simultaneous speech. Researchers have repeatedly observed, for example, that depictive or representative iconic gestures – which seem to present images reminiscent of entities or events also receiving verbal mention – appear synchronized with, or temporally just antecedent to, apparently associated words, or 'lexical affiliates' as they are called. 'Formless' gestures, dubbed 'batons' or 'beats,' seem instead to track speech rhythm, falling at once on stressed syllables and points of presumed speaker emphasis. Furthermore, deictic gestures allow interlocutors to indicate referents spatially (although sometimes in virtual space), and thus provide a (sometimes seemingly indispensable) complement to roughly simultaneous spoken referential expressions, such as *this* or *that*.

Theorists adopt sometimes diametrically opposite positions, however, about the differences between gesture and speech as communicative resources. Some think gesture 'leaks,' betraying a speaker's true feelings and thoughts, perhaps in opposition to more treacherous (because more conscious?) words which may try to conceal them. Or they may see gestures as largely involuntary somatic twitches, simply reflecting the speaker's (or the mind's) struggle to externalize inchoate inner images as a linear sequence of verbal elements. This article will largely ignore the putative 'inner' processes that underlie gestural production, to concentrate instead on the semiotic and functional properties of gestures. We take for granted the communicative potential of gesture in the process of utterance, and its connections with social and cultural formations more generally. For just as gesture is integrated with utterance, tying words directly to a spatiotemporal context, it is also part of wider

cultural routines of the body, susceptible both to the stylization and persistence of custom – patterns of gesture have evidently remained largely intact in Naples for several centuries, much longer, no doubt, than patterns of speech – and to the ideological productions of culture to which we turn at the end of the article.

Meanings and Interactions

Gestures function like other signs, verbal or otherwise. To expand on a gestural typology already alluded to, a commonly cited Peircean trichotomy can be applied to gestures. Conventionalized – thus symbolic, in the Peircean sense – emblems, with specifiable 'citation' forms (thus, in Kendon's terms, 'quotable' – 'and then she did **this** [quoting the gesture]') and holophrastic as well as lexemelike meanings, except for their manual modality resemble certain spoken expressions. The conventionality can be seen partly in specific criteria of well-formedness (the circle of the 'OK hand' is made with the thumb and the index finger, with the others extended slightly upwards, not with just any fingers, and presumably not with other orientations of the hand, orientations which in other cultural settings can produce very different meanings). Conventionality is also evidenced by the families of use to which such culturally specific gestures are put. Indeed, emblems are in both form and function much like interjections, or 'response cries' (Goffman, 1976), which also may depart from the phonotactic canons of a language and which inhabit a characteristic expressive realm – often, for example, indexing various kinds of disapproval or designed for interpersonal social control – but which remain highly culture specific nonetheless.

There are symbolic and conventional aspects not just to a society's repertoire of emblems but to nonce gestures as well. Hand shape in gesture, for example, is sometimes highly specific: how one points, with what digits or other body parts, and what sorts of thing one can refer to with a specific sort of pointing gesture, are matters carefully (and symbolically) regimented in many cultural contexts. In Tepoztlan, Mexico (Foster, 1948), one used different hand shapes to show the height of a table, a donkey, or a child, and using the wrong sort of hand remains a potential insult throughout Latin America. Recent investigation proposes that even in spontaneous gesticulation different hand shapes come in 'families' with highly schematic shared meanings: 'precision' or 'offering,' for example, associated with the 'precision grip' (the touching thumb and index figure of the 'OK hand') or 'open palm' hands, or 'individuation' associated with a lone extended finger. Presumably, however natural the explanations for such groupings may seem, cultural tradition and transmission must be centrally involved in propagating such families of form.

Gestures are also heavily iconic, depicting aspects of objects and actions by selectively mirroring or diagraming shapes, movements, and configurations of entities or events that provide the vehicles for gestural interpretation. A Guugu Yimithirr man, for example, describes how his boat capsized in a storm. He gesturally evokes the rolling motion as the boat was picked up by the wind and tossed on its side (Figure 1), saying "like **this**." Resemblance is, of course, a feeble principle for interpreting a sign, and interlocutors must always infer what aspects of a demonstration they are to attend to – one reason that words and gestures frequently complement one another semiotically, or that gesticulation uninformed by the accompanying words may remain obscure, until the soundtrack (or the subtitles) are turned back on. Because gestures iconically – if schematically – demonstrate actions and depict objects, they can also incorporate varying perspectives or viewpoints on such action, often more directly than can syntactic and lexical devices which imply voice or valence. A gesturing hand can represent now an object, now a tool for operating on it, now an actor manipulating it, and now an observer of the scene. Gesture can also suggest granularity or resolution (for example, in gestures accompanying directions or instructions), as well as specifics of the configuration and shapes of objects – a principle exploited in sign language nominal classifiers, and used to advantage in spontaneous gesticulation as well. A hand holding even an imaginary object adjusts itself to its shape and weight.

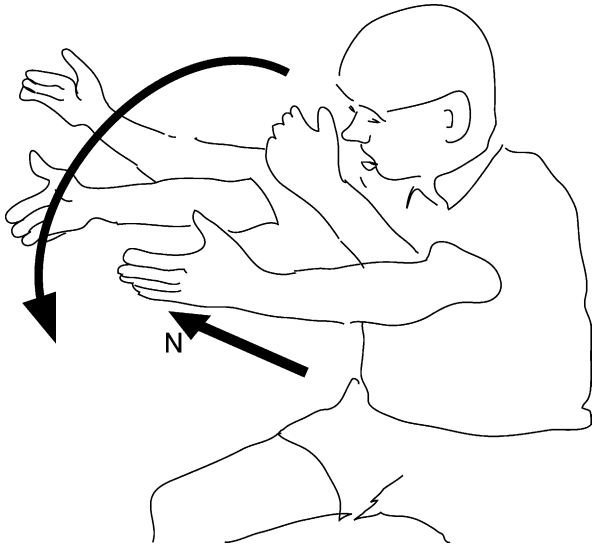

Figure 1 First shipwreck gesture.

Finally, gestures indexically project the contexts of their occurrence. The rhythmic gesticulations called beats, mentioned above, are almost pure indexes, tracking the speech stream much in the way a conductor tracks a score, and additionally parsing it into significant segments. Even the most wooden of gesturers – from Englishmen to presidential candidates – seem to punctuate their syllables gesturally. However, the observed synchrony between gestures in general and their apparently affiliated words is itself an indexical trace of the temporal unfolding of an utterance. A pointing movement, another classic indexical sign, may pick out a perceptually available referent, but it may also create an invisible one in thin air, leaving it available for later resumption by gestural (or spoken) anaphor. Clark (2003) describes a range of object manipulations, which he calls 'placing,' to achieve referential ends parallel to those of 'pointing.' Crucially, gestures of 'placing' depend for their success on the structure of space – and of particular culturally significant spaces (from store counter tops or queues, in Western society, to the hearth or the notorious witchcraft cave in, for example, indigenous Mexico).

Pointing gestures are of particular interest because they combine all the Peircean modalities and additionally require careful conceptual coordination between interlocutors to convey their meanings. Consider the case of Rosa, in Figure 2, who makes a complex double pointing gesture, when she reaches the climax of a story about an elderly woman who opened the downstairs door of her house to some threatening men. Afraid, she wanted to escape out the same door, but could not because she had left the upstairs door to the house itself unlocked. In Friulian, Rosa narrates the older woman's dilemma in the present and in the first person: "*Nopos la vie parze che o ai lepuarte viarte* [I cannot leave because I have the door open]." She performs the double pointing gesture in two stages: her left hand reaches out with the fingers extended loosely to the right when she says "I cannot leave"; then her right hand – which has accompanied the other in the move to the right – forms a pointing hand and points up to her left as she says "the door open." The gesture invokes diagrammatically the configuration of the house (an outside door to stairs which lead up to the main dwelling) which Rosa's audience knows well. It indexes the relevant locations in that conjured space. Rosa uses conventional index finger pointing to signal the unlocked door, and a looser pointing hand to show the blocked escape route. And, interactionally, the double point captures perfectly the protagonist's dilemma: a choice between two impossibilities.

Figure 2 Double pointing gesture.

Directional indexicality also infects gestures otherwise based on quite different semiotic principles. A gestural imprecation, for example, can be performed in a specific direction, indexing at once its target and its author. A depiction can combine the representation of a referent's size with an indexical indication of its position. In the shipwreck example mentioned above, the gesture not only illustrates the boat's rolling motion but also indexes the cardinal direction in which the boat flipped over, given prevailing storm winds. Contrast Figure 1, where the speaker has north to his right, and shows the boat flipping in front of him, i.e., to the west, with another performance of the same story where the narrator is facing north, and depicts the boat flip with a very different motion, but in the same direction (see Figure 3). Indeed, the shipwreck gesture illustrates a perhaps unexpected sort of gestural convention, since it is a norm for speakers of Guugu Yimithirr (and in other communicative traditions, too) that gestures depicting motion, real or hypothetical, remain faithful to cardinal orientation (Haviland, 1993).

Though most research has concentrated on gestural 'meaning,' gestures (along with attitudes of the body more generally) are clearly central in coordinating (inter)action. The preconditions of face-to-face communication involve positioning bodies to allow, restrict, or prevent mutual access. Moreover, states of talk can be restructured and reorganized in part by the talk itself, and in part by reorientations of interlocutors brought about by gesture, shifts in gaze, and adjustments of posture. Theories of the ontogenesis

Figure 3 Second shipwreck gesture.

of gesture often link children's manipulation of objects as the source for later gestural 'ritualization.' Pointing, for example, appears to grow out of grasping and reaching. Even in adults, handling objects, moving them, and directing attention to them and to the spaces around them seem to give rise to gestural routines which, in turn, can become routinized or 'grammaticalized' through the course of an interaction. Gesture is thus embedded in bodily techniques, themselves notoriously shaped by cultural practices.

Ideologies of Gesture

Like other cultural practices, gesture when it rises to explicit consciousness inspires metatheory and ideology. The most astute early students of gesture, from de Jorio to Efron, comment with skepticism on theories which purport to link the proclivity to gesture, or gestural exuberance, to aspects of personality or temperament, if not to gentility and good breeding, or even to race and national character. The fact that such links have been advanced, nonetheless, suggests something about a an ethnotheory of the communicative economy which gesture and speech jointly inhabit. The fact that some populations – ranging from Warlpiri women in mourning, who must not blurt out certain tabooed words (Kendon, 1988), to members of monastic orders who abjure the worldliness of words – voluntarily substitute elaborated, conventionalized systems of gesture for speech, is a kind of reversal of the common injunction on children in other societies not to point or impolitely overuse their hands in talk.

Arguments about the communicative virtues of gesture seem always to involve subtle and perhaps contradictory ideological stances: Roman orators (like modern-day politicians) hoped to become more persuasive through calculated use of gestures; but pop psychologists argue that 'body language' is truer – precisely because deeper and less susceptible to conscious manipulation – than words. Some theories find gestures peculiarly appropriate to situations where words fail – over great distance, or in situations of too much (or too little) noise; others find virtue in their surreptitious and silent potentialities (as in the case of the Cuna lip point [Sherzer, 1972], which can be a vehicle for clandestine criticism or mockery). Finally, the analytical debates about whether gesture is a speaker's or a hearer's phenomenon (i.e., whether it is, in the psychologists' parlance, 'communicative') reflect pernicious dichotomies that surround such culturally specific notions as volition and intention, individual vs. community, or knowledge/mind vs. practice/body.

See also: Gesture and Communication; Gestures: Pragmatic Aspects; Sign Language: Overview.

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Gestures: Pragmatic Aspects

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(Hand-) gestures play many diverse roles in human life and do many different jobs in social interaction. Gesture – simple emblems like the thumbs-up sign as much as ongoing gesticulation that accompanies talk – is a most flexible resource that is utilized in a multitude of cultural practices, ranging from legal proceedings to work in mines to the making of music and intimate moments of talk, and it is always in play when people collaborate with their hands on common tasks. The practices of gesture are heterogeneous and difficult to subsume under a common denominator, other than that the activity involves communicative action of the hands. The view adopted here is focused by the question how gesture serves persons – *embodied actors* – who are acting in the world together, within specific ecological and cultural settings, and together making sense of it; gesture is conceived as a mode (or set of modes) of bodily action by which the world is structured, known and understood, not in the first place as a system of signs or a mode of expression.

Gesture serves human activities, including conversation, in a number of different capacities that can be conceived as *alignment-types*: ways of aligning people, gesturing hands, and the situated world within which they interact. Alignment types are distinguishable on the basis of the framework of participant orientation within which gestures are perceived and understood, i.e., in terms of their alignment and coordination with gaze, speech, action, and the setting or landscape within which the interaction takes place. Six alignment types are distinguished here, leaving open the possibility that there are others:

1. hand gestures can aid in the structuring and making sense of the **world-at-hand** (i.e. the world **within** reach of the hand);
2. they can serve for orientation within and understanding of the **world-within-sight** (but **beyond** reach of the hands);
3. gestures can represent or **depict** the world in its absence, within the 'gesture space' (McNeill, 1992) that is created by the participants' orientation to the gesturing hands;
4. hand gestures, often in combination with other bodily action, can **embody communicative action** and discourse structure;
5. they can **mediate and regulate transactions**; and
6. they can construe content that is conveyed by the verbal utterance that they accompany (**ceiving/ception**).

In the following, the features of each alignment type are described, and gestural practices that are characteristic of it are discussed. The last section of the article delineates aspects of the coordination of gesture and speech.

Making Sense of the World at Hand

A great deal of inconspicuous gesturing occurs while people and their hands are actively engaged with the world at hand. Gestures arise as a byproduct of and in the service of practical action, disclosing features of the immediate scene, or otherwise involving the touching, feeling, grasping, and handling of whatever is at hand, and maybe the making of something from it. Gestural practices that are coupled with the world at hand are often excluded from the study of gesture, which is treated as movement in the air by empty hands. However, wherever cooperation involves the handling or making of things (including the making of graphic marks on paper), one finds manifold

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indexical, iconic, and symbolic actions of the fingers and hands, and often these are entirely indispensable, given the type of activity underway and the communication tasks that it raises for the practitioners (Ochs, Gonzales *et al*., 1996).

Among the 'jobs' that gestures do in the world-at-hand are: to structure the participants' perception of objects; to disclose intrinsic, invisible features and affordances of things; to analyze, abstract, and exhibit action; and to 'mark up' the setting. Gestures can arise as minimal modulations of instrumental acts, performed for the benefit of the coparticipants, e.g., in the context of demonstrations.

Genres of gestural practice found within the world-at-hand include, among others:

Tracing: An index finger, set of fingers, or hand is moved along a surface, thereby drawing a line, but also gathering tactile information, in order to discover (feel), disclose, and broadcast undisclosed features of objects or to inscribe real or imaginary marks on surfaces (e.g. to suggest possible features and fields of action). Goodwin writes:

> A quite general class of cognitive practices consists of methods used to divide a domain of scrutiny into a figure and a ground, so that elements relevant to the activity of the moment stand out. ... Through these practices structures of relevance in the material environment can be made prominent (Goodwin, 1994).

Exploratory procedures (see Gibson, 1962): These are patterned actions by which hands systematically explore intrinsic object properties (texture, volume, consistency, temperature, brittleness) and affordances (what can be done with objects). While these actions serve the information-gathering needs of the actor, they are easily enhanced so as to disclose, i.e., make visible and broadcast, the qualities that are discovered through them. Demonstrative haptic or tactile explorations provide for shared understandings of the material features and functional characteristics of the things that require our attention.

Highlighting action and its accessories: Practical actions or their stages are elaborated through formal operation such as exaggeration, repetition, and segmentation, to disclose their logic, components, and characteristics to coparticipants. Gesturalization serves as a method for the self-explication of manual action. Minimal modifications – e.g., the repetition or exaggeration of a component act – can serve to draw attention to stages or accessories of the activity.

When the participants employ artifact-based representation practices (e.g., writing, diagramming, doodling) in addition to speaking and gesture, as is common in many lines of work, gesture can become aligned and enmeshed with them (Streeck and Kallmeyer, 2001), which can result in hybrid symbolic acts (e.g., symbolic gestures committed to paper, a line drawn on paper to emphasize a currently spoken word); situated, ephemeral graphic artifacts such as doodles and/or the acts of making them thus take on social-symbolic functions. Gesture is also indispensable as a medium for the interpretation of professional diagrammatic representations: architectural and engineering blueprints, for example, are enhanced by gestures showing motion, changes over time, or the dimension of height that the flat diagram lacks.

What distinguishes this entire variety of gesture uses from other basic varieties is their alignment within the material, perceptual, and cognitive ecology of the situation: they are perceived and understood by reference to their contiguity with objects and instrumental acts. In other words, the participants' visual attention encompasses gestures and things, and these elaborate one another. Gesture directs the recipient's attention, an effect that is also achieved by the placing of objects in the recipient's line of regard. Gesturing about and arranging objects are activities that serve epistemic functions and often go hand in hand (Kirsh, 1995).

Revealing the World within Sight

A different framework of person-gesture-world alignment is realized when the gesture orients the participants to the visible world beyond the reach of the hands. This is the prototypical realm of pointing: an extended index finger or hand (or another array of body parts whose constellation can be seen as a vector) enables the participants to coordinate their orientation so that they jointly focus their gaze on a distant object, feature, or location. Pointing is only one type of orienting behavior, however; posture, gaze direction, and head orientation can serve similar purposes, as can the placing of an object in the interlocutor's line of regard (Clark, 2003). And pointing is not universally executed with an extended index finger (Wilkins, 2003); other varieties include lip-pointing (Sherzer, 1972) and pointing by gaze and movements of the head. Within a given repertoire, there may also be pragmatically motivated alternatives such as pointing by index finger – to individuate an object among other objects – and pointing with the open hand – to select an object as an exemplar of a kind (Kendon and Versante, 2003). Handshape and motion patterns can also serve to **characterize** the focal object, i.e., to shape the recipient's perception of it. Gestures made in this mode serve spatial orientation as well as the sharing of sights: once a shared visual focus is established, what is seen together can then be structured by gesture; motions of the

fingers and hands project lines, vectors, points, etc., onto seen scenes, indicating **how** what is visible should be regarded. The visual field – i.e., the culturally structured landscape within sight – is thus augmented and made intelligible by layers of cognitive-manual actions and forms.

Depiction by Hand

The third alignment type of hand gestures is brought about when interaction participants turn away from the world and focus attention inside their interactional huddle, and, by their bodily orientation and positioning in space, mark off the space between them as territory of their interaction. The interaction space becomes the stage for hand gestures when attention is, however fleetingly, focused on the speaker's gesticulating hand(s) (Streeck, 1993). This happens whenever gesture is employed as a representation device, to depict aspects of the talked-about world, whether concrete or abstract, real or imagined. When gesture is used to depict or represent, for example in the context of narrative, recipient attention is solicited for the gesturing hands. This is done, for example, by including deictic expressions in the talk, some of which, for example deictic adverbs (Spanish *asi*, German *so*), seem to be primarily designed for this task. In the context of depiction, gesture is a foregrounded activity. Descriptive (depicting) gestures represent worlds in collaboration with speech, and they are understood by reference to what is **known** about the world, not what is seen at the moment.

While the category 'iconic gestures' is a familiar one, the actual study of gestural depiction is in its infancy (but see Müller, 1996; Kendon, 2004). The most detailed accounts describe iconic devices in sign languages of the deaf (Mandel, 1977), which however operate under different conditions and carry different representational loads; they function in part by virtue of their paradigmatic relations to other signs within large, conventionalized repertoires. Practices by which worlds are depicted on the gesture stage include the placing of imaginary objects on the stage; diagramming relations between them; enacting practical action schemata; sculpting volumes; and drawing outlines, among others. Some of these representational practices may be derived from other cultural practices (e.g., from drawing in sand). Most important, because most readily available to the hands, are acts of virtual grasping and handling, by which objects and instruments are evoked.

When complex imagery is assembled over time, as is the case when complex objects or events are described, the two hands often complement one another: one may 'hold' and classify the object, the other supply additional characterizations or arguments (Enfield, 2004). Repertoires of routinized and sometimes specialized methods of gestural depiction are part of the tacit communicative skills required by various professions, including designers and engineers.

Gestural depiction does not work by virtue of the hands producing shapes that **resemble** real-world phenomena, but rather because in a given context an action of the hand can be seen as **characterizing** a phenomenon or experience, and much as any phenomenon can be characterized by a multitude of words, it can be characterized by a multitude of gestures. Often, although essential to the success of the communication, the representational load of a gesture is minimal, because it is embedded within rich linguistic descriptions, and all it must do is to evoke a single feature for the practical purposes of the activity at hand (Arnheim, 1969).

Embodying Speech and Communicative Action

Another alignment type and functional genre of hand gestures that is common in the context of conversation, but also occurs interwoven with gestures of other alignment types, is the use of the hands in the embodiment of communicative action. This includes gesturing by which the communicative act performed (question, proposal, imploring, and so on); aspects of the pragmatic and syntagmatic structure of the unfolding utterance; and coherence relations between successive or separate utterance parts are shown or foreshadowed. A minimal version of this mode of gesturing are beats, i.e. hand movements characterized less by a distinct handshape or form than by repetitiveness and emphatic synchronization with the rhythm of speech, and signifying not so much by form as by changes in form which cue the beginning of a new speech unit. The pragmatic mode of gesticulation also includes pronominal referential gestures: pointing-like motions, often made by the thumb, which individuate and refer figuratively within the universe of discourse, marking acts of reference to nonpresent people, locations, or points in time. And it includes the display of the stance that the person takes towards an utterance or the content expressed. Pragmatic gesture encompasses all actions of the hands (and a variety of other body parts, notably the face, head, and shoulders) by which aspects of the communicative interaction are displayed. The category also includes recipient actions, such as head gestures of affirmation and negation or rejection that are known throughout human societies. Speech act gestures (gestures that embody illocutionary

force) often possess metaphorical quality: they figure aspects of the processes of speaking and communicating as handlings of physical objects or as conduit (McNeill, 1992) (*see* **Speech Acts and Grammar**).

The characteristic alignment of pragmatic gesturing is its occurrence at the periphery of the interaction space: such gestures are commonly executed outside the line of sight of the speaker and at the periphery of the visual range of the addressee. They are rarely subjected to the speaker's visual control. While this is the unmarked way in which communication is embodied, occasionally pragmatic gestures are made salient by being performed in the segment of the interaction space that is usually reserved for gestural depiction. Generally during conversation, the embodiment of speech and communicative action and process by hand gestures is a background process. But pragmatic gesturing is also the most ubiquitous, irrepressible, and perhaps indispensable variety of gesture, contributing greatly to the precision timing and entrainment that are characteristic of so much conversational interaction. Many societies have conventionalized at least some pragmatic gestures; some, such as that of southern Italy (Kendon, 1995), have evolved large repertoires (de Jorio, 2000 (1852)). Yet we also find immense individual variation in pragmatic gesturing; individuals tend to evolve habitual personal styles of gesticulation, and these idiosyncrasies are most obvious in pragmatic gesticulation.

Ordering and Enabling Transactions

Gesticulation in the pragmatic mode overlaps to a large extent with another usage variety; possible differences in alignment, however, suggest that it be treated as its own kind. This is gesticulation, that is also occupied with the communicative process, but at the same time addresses other interaction participants whose actions it is intended to regulate. This mode of gesturing can involve touching the other (Efron, 1972 (1942)), thereby eliciting attention or allocating a turn, soliciting response or attempting to silence it, and directing the attention of others to one another, among many other interactive and social-organization functions that these gestures serve. Many gestures blend the display of communicative action with the regulation of the behavior of others, and the distinction between these two modes is of only limited analytic value: at one end of the polarity, gestures are aligned with what the speaker is presently doing, and convey something about it; at the other end, they are performed in attempts to structure the actions of other participants. Often a gesture is aligned in both ways at the same time, or the two functions are realized at different points within the same gestural action.

Interactive or transactional gestures have enabled the development of codified, specialized gesture codes by which complex transactions such as vehicular traffic (the gestures of traffic cops), legal proceedings (as in medieval codes of law), or the making of music (through the gestures of conductors) are ordered or accomplished.

'Ceiving'

The last mode of gesturing included here is not usually treated as a distinct mode, but rather as the paradigmatic form of all gesturing other than pointing; however, it is easily distinguished in terms of the way it is aligned with the interaction participants' lines of regard as well as the current state and progress of talk. This is a mode of gesturing that is adequately described as 'thinking by hand': it involves the speaker's hands producing schemata in terms of which utterance content or narrated experience is construed. This mode is usually lumped together with gestural depiction (under the label 'iconic gesture'); however, although 'ceiving' or 'ception' is usually a component or means of gestural depiction (as well as of pragmatic gesticulation), it also occurs on its own, within an alignment framework that is different from both gestural depiction and pragmatic gesticulation. The 'pure' variety of ception is realized whenever speakers, **without attending to the process**, use their hands to give form to – i.e. construe – content. Often this is done via a simple or complex schema of grasping – by means of a prehensile posture (Napier, 1980), which is why this author labels it 'ceiving' or 'ception' (from Lat. *cap-*, take; a pattern thus formed is called a 'cept'). Ception is a bodily form of conceiving, i.e., of conceptually structuring content to be articulated in speech: this content-to-be-made-sense-of is **grasped** by an abstract prehensile action (the grasp occurring 'in the air').

The notions of ceiving/ception and cept that are introduced here are predicated upon a view of thinking as an activity not of the mind or brain but of the entire person, involving the body and its cultural skills in relevant ways, and of grasping by hand and other modes of handling objects as primary human forms of exploring, recognizing, and understanding the world, activities which provide numerous models after which linguistic concepts are formed, including the concept 'concept' itself, which depicts the process of making-sense-of (conceiving) as 'taking-hold-of-together,' i.e., as action by the hands. In ception, thinking-for-speaking draws upon the intelligence and world-knowledge of the hands. In contrast to depiction, during which the speaker **controls** the

activity of the hands, during ception the speaker is **dependent on** his or her body to 'come up with' an appropriate cept: the process of speaking becomes dependent upon embodied knowledge. Thus, when we observe speakers forming cepts while speaking, we witness the very process of embodied thought. Cepts, of course, are also formed and used during acts of depiction, in which case they depict phenomena in terms of ways of grasping or handling them. And many pragmatic gestures – metaphorical ones – are ceivings and articulate the process of communication as a handling of things (*see* **Pragmatic Acts**).

The extent to which speakers rely on 'pure' ceiving (i.e. ceptional acticvity of the hands performed outside the realm of conscious awareness and without specific depictive aims) to aid them in the formulating of talk and the making of sense appears to vary greatly. When the activity occurs, however, it is easily recognized: it involves the speaker orienting to the interlocutor, not to the gesture (ceiving is a background process), and performing largely haptic motions whose gestalt often coincides with subsequently uttered concepts. When interlocutors see the speaker actively searching for a concept (i.e., a word), they may volunteer one that fits the cept that the speaker has presented. In other words, listeners have privileged access to the speaker's gestured cepts (which is *not* the case during depiction).

Pragmatic Function and Placement of Gestures

Word searches demonstrate the importance that the relative ordering of gesture and speech has for the process of intersubjective understanding: during ception, manually performed cepts usually precede verbally articulated concepts. The hands are given an opportunity to find the first form that makes sense. Interlocutors are thereby afforded previews of concepts, enabling them to build understanding incrementally. Within the context of the other alignment frameworks, relative ordering of gesture and talk is organized differently and meets different tasks. When gesture is engaged with the world-at-hand, talk is often subservient to and made to fit the manual-visual procedures by which the scene is illuminated and its perception shaped. Pointing is coordinated with specific classes of linguistic expressions (deictics and demonstratives) (*see* **Deixis and Anaphora: Pragmatic Approaches**). During depiction special linguistic expressions and gaze direction are used to direct the recipient's visual attention to the gesture; gaze, talk, and gesture are orchestrated with great precision to render multimodal representations of worlds beyond the interaction space. Embodiments of communicative action, in contrast, and many other-directed, interactive, or transactional gestures are background processes, perceived peripherally (by listeners) or kinesthetically (by speakers), and providing an ongoing interactional framing and footing of the talk that occupies the focus of attention. Very important for the functions of pragmatic and interactional gestures, on the other hand, is their exact placement within the turns and sequences of interaction within which they occur (*see* **Conversation Analysis**). Gestures made just prior to or during the initiation of an utterance can foreshadow the speech act for which the turn is taken; ongoing gesticulation in mid-turn can mark the continuing relevance of the speech act frame of the turn, or the performance of a series of such acts, for example during extended turns at talk; and gestures made during or after utterance completion can indicate the kind of response that is sought for it, or the stance that the speaker takes with respect to what is conveyed (as is the case with shrugs, which are common during utterance completion).

All gesturing of the hands is co-orchestrated with speech prosody: gesture units coincide with prosodic units, and gesture strokes are coordinated with prosodic stress. In some specialized varieties (the gestures of rappers and conductors, for example), but also sometimes during ordinary conversation, gestural motions appear to map out the movement of the voice, thereby visualizing acoustic phenomena. To some extent, this coordination is a by-product of the self-synchrony of the human body: muscular actions of the limbs synchronize with muscular action of the vocal apparatus. At times, however, the hand's dancing to the vocal beat is a more deliberate practice of revealing the ongoing organization of speech, offering the recipient hand-packaged 'chunks' of talk by providing coherence via rhythmically placed iterations of a gestural act.

See also: Conversation Analysis; Deixis and Anaphora: Pragmatic Approaches; Gesture: Sociocultural Analysis; Gesture and Communication; Pragmatic Acts; Sign Language: Overview; Speech Acts and Grammar.

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Ghana: Language Situation

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General Characteristics

Ghana is on the coast of West Africa, 7° north of the equator. Its total population is approximately 18 000 000, according to the 2000 census. The official language of the country is English, but all its immediate neighbors, Togo to the east, Ivory Coast to the west, and Burkina Faso to the north, are officially Francophone. There are approximately 50 indigenous languages, i.e., languages spoken by those who can claim a historical homeland within Ghana. Akan is the most widely spoken language, but no single language is the first language of a majority of the population.

Multilingualism

English is the official language of government and education, but not every Ghanaian speaks it. Most children, especially in the most rural areas, hear English only in school. Virtually all Ghanaians speak one or more indigenous languages, and bilingualism is very common; in urban areas, many people, especially those who come from other parts of the country, speak four or more languages. Anyone who has been to school speaks at least one Ghanaian language, and English at least to a degree. Many people speak Akan in addition to their own language.

Another widely spoken second language is Hausa, especially among people from northern Ghana and beyond who have migrated into urban centers. Hausa was first introduced into the country by trading caravans coming from the north of present-day Benin and Nigeria, and owes its present position as a lingua franca to its use by the colonial police and army, whose members were recruited largely from northern Ghana and regions to the east, where Hausa was already commonly spoken.

Language in Education

The Ghanaian policy on language in education has vacillated between requiring English as the only