

## 27. Gesture


1. Introduction
2. Gesture in spoken languages
3. Gesture in sign languages
4. Conclusion
5. Literature

### Abstract

*Gestures are meaningful movements of the body, the hands, and the face during communication, which accompany the production of both spoken and signed utterances. Recent research has shown that gestures are an integral part of language and that they contribute semantic, syntactic, and pragmatic information to the linguistic utterance. Furthermore, they reveal internal representations of the language user during communication in ways that might not be encoded in the verbal part of the utterance. Firstly, this chapter summarizes research on the role of gesture in spoken languages. Subsequently, it gives an overview of how gestural components might manifest themselves in sign languages, that is, in a situation in which both gesture and sign are expressed by the same articulators. Current studies are discussed that address the question of whether gestural components are the same or different in the two language modalities from a semiotic as well as from a cognitive and processing viewpoint. Understanding the role of gesture in both sign and spoken language contributes to our knowledge of the human language faculty as a multi-modal communication system.*

### 1. Introduction

It is a generally accepted view that the world's languages can be grouped into two main types in terms of the modality through which communicative messages are transmitted. On the one hand, we have sign languages, the natural languages of Deaf communities, which are transmitted mainly in the visual-gestural (spatial) modality by employing manual and non-manual articulators. On the other hand, there are spoken languages, which use mainly the vocal-auditory channel to organize communicative events (e.g., Meier 2002). However, this simple distinction between spoken and sign languages does not capture the multi-modal complexity of the human language faculty.

In addition to the vocal channel, spoken languages all around the world also exploit the visual-gestural modality for expression and use *gestures* accompanying speech with the hands, face, and body as articulators (e.g., Goldin-Meadow 2003; Kendon 2004; McNeill 1992, 2005). For example, speakers can use an 'OK' gesture as they utter the word "OK", move the fingers of an inverted -hand in a wiggling manner while saying "He walked across", point to two empty spaces in front of them while saying "She went from the bank to the supermarket", or use bodily demonstrations of reported actions as they tell narratives. Gestures are part of an utterance in vocal languages

and contribute semantic, syntactic, and pragmatic information to the verbal part of an utterance. Thus, in order to be able to understand the fundamental features of our language faculty, we need to understand how both sign and spoken languages exploit the multi-modal nature of the human communicative ability.

This chapter will give an outline of historical as well as state-of-the-art debates and findings concerning similarities and differences between sign and spoken languages when the multi-modal nature of expressions (produced by the hands, body, and face) both in sign and spoken languages are taken into account. This will bring us to the issue of how gestural components of language might manifest themselves both in sign and spoken languages. Since recent theories and studies about gestural components in sign language have been based on ideas about how gestures are used in spoken languages, I begin by reviewing research on gestures in spoken languages in section 2. In section 3, I outline how some of these ideas have been transferred and adapted to our understanding of possible gestural components in sign language.

## 2. Gesture in spoken languages

Even though historically there has been initial interest in manual modality as part of language, in the last century the field of linguistics has evolved as the science of *speech* (see Kendon (2004) for a review). Only recently, the gestures that speakers use have become a topic of inquiry in linguistics, psycholinguistics, and communication studies (see McNeill 1992, 2005; Kendon 2004; and Kita 2008 for a review).

In this section, I will begin by giving an overview of different types of gestures that can be used by hearing speakers (section 2.1). In section 2.2, I will discuss different views concerning the relationship between speech and gesture.

### 2.1. Definition and classification of gestures

Kendon (1986, 2004) defines gestures as visible actions of the hand, body, and face that are intentionally used to communicate and are expressed together with the verbal utterance. These gestures are considered to manifest themselves in a continuum of conventionalization in terms of form and meaning as well as in different semiotic types and functions during communication (Clark 1996; Clark/Gerrig 1990; Kendon 2004; McNeill 1992, 2005). Furthermore, while some gestures occur as accompaniments to speech (these are sometimes categorized under the term ‘gesticulations’ such as representational gestures, abstract points, beats), others can replace or complement speech in an utterance or can be used without speech (such as emblems, pantomimes, or interactional gestures), as explained further below. When talking about types of gestures, it is important to keep in mind that different scholars have proposed different categories and semiotic types of gestures used by speakers. Thus, the following list does not include all of the categories proposed so far (see Müller (2009) for a more extended categorization or Kendon (2004) for an extended review of different classifications proposed so far).

### 2.1.1. Emblems

Some gestures, such as the so-called ‘emblems’, are quite conventionalized and culture-specific in form and meaning; examples being the ‘OK’ and ‘perfect’ gestures. There is an arbitrary relationship between the form of an emblem and the meaning it conveys. Emblems do not rely on the accompanying speech in terms of their production and comprehension. In many cases, they can also replace or be used without speech. Some of these gestures can also have illocutionary force, in that they may invite the interlocutor to act in a certain way in the communicative interaction, for instance, a ‘come’ gesture asking somebody to come near or placing the index finger on the lips to ask someone to be quiet.

### 2.1.2. Representational gestures

‘Representational’ gestures (sometimes also referred to as ‘iconic gestures’) are less conventionalized and bear a more motivated (i.e., iconic) relation between their form and the referent, action, or event they represent compared to emblems. For example, a stirring hand movement accompanying a verbal utterance about cooking bears in form a resemblance to the actual act of stirring. Even though such gestures are visually motivated, the meaning they convey relies heavily on the speech phrase they accompany. Experimental studies have shown that in the absence of speech, the meaning of these gestures is highly ambiguous and not at all transparent from their form (Krauss et al. 1991). Thus, when these gestures occur, they almost always overlap with semantically relevant speech (see examples (3) and (4) below).

Representational gestures vary in terms of their semiotic characteristics, that is, in the way they can represent objects, actions, or events. Some examples of representational gestures are provided in (1). Müller (2009) categorizes these gestures as belonging to different modes of representation; her classification is given in parentheses following each example.

- (1)
  - a. Moving the hands as if opening a window (enactment mode)
  - b. Tracing the shape of a picture in the air with two index fingers (tracing mode)
  - c. Hands move as if modeling bowls, boxes, etc., i.e. as if molding the objects in a 3-dimensional way (modeling mode)
  - d. A flat hand represents a piece of paper (representing mode)

It is also important to note here that representational gestures do not always depict concrete object, actions, or events. They can also be used to represent abstract notions and concepts such as time, ideas, etc., for instance, when moving a flat extended hand downwards to depict the iron curtain that separated the Western from the Eastern World (example from Müller (2009)). These types of gestures have also been termed “metaphoric gestures” in the literature (McNeill 1992).

### 2.1.3. Pantomimes

‘Pantomimes’ differ from representational gestures in that they can convey meaning on their own without speech, bear a more visually transparent relation between their

form and referent, and thus are not usually used to accompany speech, but to replace or complement speech. Pantomime gestures can often be used in reports of actions (as in direct quotations) and occur sequentially with the speech segment, rather than simultaneously (Clark/Gerrig 1990; Clark 1996). Example (2) illustrates the sequential, complementary, and pantomimic nature of a gesture as quoted action (Clark/Gerrig 1990, 783).

- (2) I just got out of the car and I just [demonstration of turning around and bumping head into a pole]

#### 2.1.4. Points

Gestures can also be in the form of pointing that accompanies verbal references to entities. Such pointing gestures can either be concrete, when targeting objects or places in the here-and-now of the discourse participants, or abstract, when pointing to meaningful abstract spaces in the gesture space in front of the speaker. The use of abstract space and pointing in gesture space allows speakers to express coherent relationships among the referents that figure in their discourse (McNeill/Cassell/Levy 1993). While the meaning of abstract points would be fully ambiguous in the absence of the speech content, points to objects in the here-and-now may sometimes unambiguously refer to objects without speech, given shared knowledge among the participants.

#### 2.1.5. Beats

Finally, gestures that obligatorily accompany speech can also take the form of ‘beats’, that is, rhythmic movements of the hands with no apparent content that seem to occur concurrently with new information or discourse contours in the speech stream. The handshapes for these gestures may vary but unlike the previously reviewed gesture types, there is no one-to-one mapping between their form and the meaning they convey.

### 2.2. On the relation between speech and gesture: Different views

According to some views, speech and gestures (all types described in section 2.1) form two parts of an integrated communicative system (Bernardis/Gentilucci 2006; Clark 1996; Kendon 2004; McNeill 1992, 2005). Co-speech gestures have been found to have several functions in the communicative system just as language does. Gestures convey co-expressive information together with the speech they accompany and they ground the speaker’s message in the here-and-now of the speech context. For example, representational gestures do not directly depict what is imagined by the speaker but they are also shaped by the shared gesture space among the interlocutors at the moment of speaking in addition to being shaped by visual aspects of the referents themselves (Özyürek 2002). Furthermore, these gestures express aspects of the propositional or conceptual content of the utterance which they are a part of and thus are considered

as part of “language” together with speech. Recent experimental and brain studies have also shown that our brain processes semantic information from both speech and gesture on a similar time course and uses overlapping neural correlates (that is, Broca’s area – left inferior frontal cortex) providing further evidence for the two being an integrated system (Özyürek et al. 2007; Willems/Özyürek/Hagoort 2007)

Even though researchers agree that speech and gesture are two related aspects of the communication system, there are slightly different views on how this relation can be characterized. Also, it has to be pointed out that different studies have focused on different types of gestures (i.e., representational, emblems, or pantomimes) and on cognitive versus communicative functions to characterize the relations between speech and gesture.

### 2.2.1. Cognitive views on the relation between speech and gesture

According to cognitive views, gestures (in particular, representational gestures) represent aspects of imagistic thinking evoked during language production. Yet views differ concerning the following two questions: (i) at what stage during the language production process are gestures produced; and (ii) to what extent are they influenced by the linguistic formulation of thinking? According to McNeill (1992, 2005), gesture and speech are derived from an initial single unit, which he refers to as ‘Growth Point’, composed of both types of representations – imagistic and linguistic. Both gesture and speech are manifestations of this combined unit of representation.

However, according to another view, the Interface Hypothesis proposed in Kita and Özyürek (2003), representational gestures and speech are best characterized as originating from different representations: gesture from imagistic, and language from propositional, representations. During the language production process, both representations interact. Previously, McNeill (1992) assumed that speakers’ representational gestures should be similar across languages and cultures since gestures tap directly on the imagistic part of the combined unit in the Growth Point. Recent findings, however, suggest that this might not be the case and that gestural information about identical events can be conveyed differently in languages that exhibit different lexical, semantic, and grammatical patterning of information. Kita and Özyürek (2003), for instance, have shown that most English speakers who describe a cartoon event in which Syl-



Fig. 27.1: Stills from the cartoon used to elicit English and Turkish narratives.

vester tries to reach Tweety by swinging on a rope from one window to another (see Figure 27.1 for stills from the elicitation clip) use the phrase “swing across/over”, which encodes both the manner (the arc) and the path (across/over) of the motion. Both these aspects are also usually encoded in their co-speech gesture, an arc-shaped trajectory gesture. A prototypical combination of an English utterance with a gesture is shown in (3).

(3) English co-speech gesture



Speech [swings over to]<sup>a</sup> Tweety's

Gesture right hand: index finger moves in an arc movement from right to left

<sup>a</sup> The brackets indicate the portion of the speech segment with which the stroke (i.e. the meaningful part) of the gesture overlaps.

(4) Turkish co-speech gesture



Speech *ordan* [atliyor]

from-there jumps

Gesture right hand: index finger moves to left laterally

In contrast, Japanese and Turkish speakers, who do not have a manner verb comparable to English 'swing' in their lexicon, commonly use a phrase meaning 'go across' to refer to Sylvester's motion. Interestingly, they also omit the arc in their gesture and instead use a straight gesture. The Turkish speaker in (4), for instance, uses such a gesture in combination with the verb *atlamak* ('to jump').

In light of these findings, it appears that gestures do not reflect the imagistic representations of speakers directly but rather reflect their imagery as shaped by a language-specific conceptualization of the event components. Thus, according to cognitive views, speech and gesture reflect two linked representational systems active during language production.

### 2.2.2. Functional/communicative views on the relation between speech and gesture

Finally, according to functional accounts, gestures and speech function together – as a composite multi-modal expression – to convey the communicator's intended message (Clark 1996; Kendon 2004, 2008). In this "multi-modal utterance view", each modality might convey information in different semiotic formats depending on the communicator's intent or the interactional context. According to Clark (1996), gestures that are clear demonstrations of actions in direct quotes (i.e., pantomimic gestures), and that are produced sequentially with speech (see example (2) above), are prime examples of the multi-modal utterance view. Clark proposes that such gestures should be considered as a 'component' of language. It is implicit in the multi-modal utterance view that speakers distribute the intended message over speech and gesture depending on the communicative intent of the speaker, but unlike the cognitive views discussed above, this view does not give a processing account of the interaction between the two modalities during production.

### 2.2.3. Summary: Gesture and speech as part of language

Thus, no matter how the link between speech and gesture is characterized, it recently has become clear that characterizations of language which only take into account aspects that are expressed through speech do not offer a comprehensive view of our language capacity. Rather, both speech and gesture should be taken into account since gestures are an integral part of language in terms of conveying semantic, syntactic, and pragmatic information. Moreover, they play a role in conceptualization during speaking.

## 3. Gesture in sign languages

This expanded view of language, which takes both speech and gesture to be part of the same linguistic and cognitive system, has recently made an impact in the field of sign language studies. After all, if gesture is an integral part of language, then it should

also manifest itself in sign languages. In almost all studies on spoken languages, the gestural component of language has been taken to be confined to what is expressed by the manual and non-manual articulators (but see Okrent (2002), who suggests that gestural components can also be expressed by the vocal-auditory channel, for example, by vowel lengthening). This has led to the question of how gestural components might be integrated in sign languages, which convey all communicative expressions in the visuo-spatial modality. Historical developments in sign language research have only recently made it possible to seek answers to such a question.

In early attempts to prove that sign languages are as complex in their linguistic structure as spoken languages (e.g., Stokoe 1960; Tervoort 1961), the idea that sign language expressions might also include gestural components was not widely accepted. This was due to the fact that, at that time, sign languages began to be studied from the point of view of structuralist linguistic models developed for spoken languages (Kendon 2008; Meier 2002). In order to show that sign languages are natural languages on a par with spoken languages, researchers emphasized the similarities between spoken and sign language structures. Indeed, in spite of the differences in the main modality through which meaning is conveyed, sign languages have been shown to share basic linguistic properties with spoken languages on the levels of phonology, morphology, and syntax (Battison 1978; Klima/Bellugi 1979; Liddell 1980; Padden 1983; Stokoe 1960; Supalla 1982). Sign languages of different countries have been shown to vary in terms of their vocabularies, form distinctions, and word order (Meier 2002; Zeshan 2004; also see chapter 12, Word Order). Furthermore, similar neural structures have been found to support processing of both sign and spoken languages (Poizner et al. 1987; see also chapter 31, Neurolinguistics), and the acquisition of both types of languages shows a similar developmental progression (Newport/Meier 1985; see also chapter 28, Acquisition). These findings have led to the conclusion that some fundamental features of language are independent of the modality of expression and pattern similarly in both spoken and sign languages.

However, recent studies have shown that in some core domains of linguistic expression, sign languages also exhibit interesting modality-specific patterns (Meier 2002; Woll 2003; see also chapter 25 on language and modality). Such modality effects are attested in, for instance, pronominalization, marking of arguments in directional (agreement) verbs (e.g., GIVE, ASK), role shifts in reports of actions and quotations, and in the expression of spatial relations (Emmorey 2002; Liddell 2003; Talmy 2003). These modality-specific properties have raised doubts with regard to whether the respective sign language structures can be analyzed in the same way as the corresponding linguistic structures observed in spoken languages, or whether they should rather be analyzed as “gestural” components in sign languages or as a combination of linguistic and gestural components. In addition, in these domains, more similarities across sign languages have been found than across spoken languages (Aronoff et al. 2003; Aronoff/Meir/Sandler 2005; Newport/Supalla 2000; Woll 2003). Recent neuroimaging studies have also reported modality-specific differences in the localization of brain structures for sign versus spoken languages (e.g., Bavelier et al. 1998; MacSweeney et al. 2002; Neville et al. 1997).

This section consists of three parts. In section 3.1, I discuss how gestures can be characterized differently from signs in terms of various dimensions. Section 3.2 presents



a number of possible candidates for (manual and non-manual) gestural components in sign languages. Finally, in section 3.3, I briefly address the issue of grammaticalization of gestures in sign language.

### 3.1. Gesture vs. sign

McNeill (1992, 2000, 2005) and Kendon (1982) have proposed several continua for the conventionalization and formation of linguistic features from gesture to sign language. McNeill (2000) offers different continua each reflecting separate dimensions according to which relations between gesture and sign can be characterized (see Table 27.1).

In the continuum of *linguistic properties*, gesticulations (representational gestures) and pantomimes both lack linguistic properties. They are non-morphemic, are not subject to phonological constraints, and cannot be combined with other gestures in a rule-governed fashion. Emblems show some linguistic constraints in that well-formed and ill-formed ways of producing an emblematic gesture can be distinguished. In the ‘OK’ gesture, for instance, the circle should be formed by the thumb and the index finger and not by thumb and middle finger. Still, emblems are not fully linguistic since they do not combine with others beyond the lexical level. Sign languages obey all linguistic constraints at the lexical and syntactic levels.

According to the *conventionalization* continuum (i.e., the extent to which form and meaning mapping is socially constituted), gesticulation and pantomime are also considered to be at the lower end of the continuum compared to emblems and signs. Gesticulations in particular are considered to be idiosyncratic and formed anew at the moment of speaking, depending on the imagery, the context, and the accompanying linguistic properties of the speech. As has been pointed out in section 2.1.2, representational gestures would be meaningless to the interlocutor in the absence of speech due to their lack of conventionalization. Emblems and signs, on the other hand, are recognizable by the members of the community in which they arose because they are highly conventionalized.

Finally, the gesture to sign continuum also reflects different *semiotic* characteristics along the following two dimensions: global vs. segmented and synthetic vs. analytic. Representational gestures and pantomimes can be characterized as conveying meaning

Tab. 27.1: Continuum from gesture to sign in terms of linguistic properties, conventionalization, and semiotics

	Gesticulation (representational gestures)	→	Pantomime	→	Emblems	→	Sign Language
linguistic properties	–		–		some		+
conventionalization	–		–		+		+
semiotics	[+global] [+synthetic]		[+global] [+analytic]		[+segment] [+synthetic]		[+segment] [+analytic]

globally in that they cannot be deconstructed into independent and meaningful elements. Rather, their meaning is determined by the meaning of the whole. In contrast, emblems and linguistic signs are composed of phonological and morphological components, which are combined in hierarchical and rule-governed ways. Moreover, gesticulations and emblems are taken to convey meaning synthetically – each unit conveys an idea that can be spread over an entire utterance – whereas in pantomime and signs, each meaning is conveyed by a single analytic unit (see Goldin-Meadow et al. (1996) for the emergence of analytic representations when speakers are asked to pantomime and a comparison to their gestures used during speaking; however, this does of course not mean that pantomimes are as analytic as sign languages are).

Note that McNeill (2000) mentions a fourth continuum which deals with the relation of gestures and signs to speech (not included in Table 27.1). He notes that while gesticulation always occurs concurrently with speech, emblems do not necessarily accompany speech. Pantomime, on the other hand, is characterized by an absence of speech, and signs obviously do not need speech in order to be produced and understood (although bimodal bilinguals can produce signs and speech simultaneously).

As a demonstration of the fact that representational gestures have semiotic and linguistic properties different from those of linguistic forms in spoken and, most importantly, sign languages (cf. Table 27.1), consider the examples in (5) and (6). Both examples were elicited by asking an English speaker and a German Sign Language (DGS) signer, respectively, to describe the same cartoon event, which shows Sylvester catapulting himself upwards to get Tweety from a window sill, grasping the bird, and coming down holding the bird (see Figure 27.2 for stills from the elicitation clip).

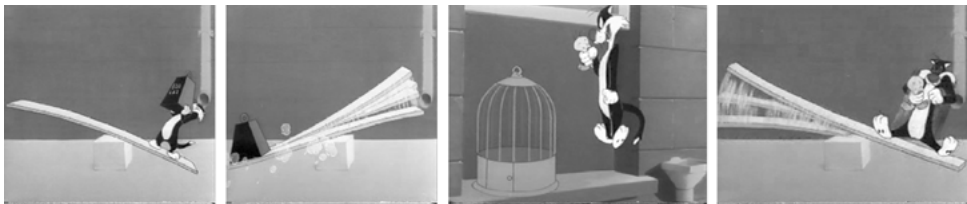
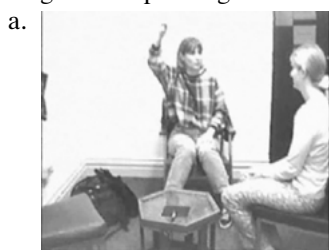


Fig. 27.2: Stills from the cartoon used to elicit English and German Sign Language (DGS) narratives.

In the English example (5), speech expresses components of the event, such as grasping the bird and going down, by means of different lexical items, combined in a phrase structure, whereas in gesture, these components are represented globally. After the speaker uses a fist gesture to represent grabbing the bird (5a), this handshape is retained as the speaker moves her fist hand down (5b). In the gesture in (5b), Sylvester is represented both as holding the bird – the speaker’s hand represents Sylvester’s hand from a character perspective – and as an entity going down – representing Sylvester as a whole from an observer perspective (see chapter 19, Use of Sign Space, for discussion of the use of different signing perspectives). These two aspects of the event – holding and going down – are represented in one single gesture that cannot be analyzed by deconstructing its elements into separate meaningful parts but that can only be understood globally.

However, when the same event is described by a DGS signer, the events of grasping and going down are described by separate signs, so-called “classifier predicates” (see chapter 8), as shown in (6a) and (6b), and cannot be combined into one sign. The grasping event is depicted by a *Handling* classifier predicate which expresses grabbing/holding the bird (6a) while the event of Sylvester going down is represented by an *Entity* classifier predicate (inverted  $\text{H}$ -Handshape) which represents Sylvester as a two-legged entity going down (6b) and crucially without the holding component. Such a depiction of event components in a segmented (i.e., each classifier predicate as a separate morpheme) and combinatorial way is characteristic of spoken and sign languages but not of co-speech representational gestures (Perniss/Özyürek 2007; submitted).

(5) English co-speech gesture



Speech *He [grabs] the bird*  
Gesture right hand: fist hand grabs



*and he [goes back] and moves down*

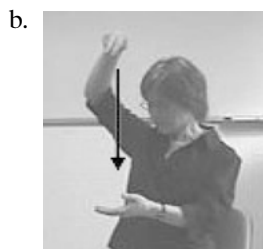
(6) German Sign Language (DGS)



right hand: HCL:grab/hold-small.object<sup>a</sup> ECL:two.legged.entity-go.down  
left hand: ECL:flat.surface


‘(Sylvester) grabs (the bird), goes down, and lands on the street.’

<sup>a</sup> HCL: Handling classifier; ECL: Entity classifier



### 3.2. Gestures in sign language

Given that in sign languages, the same articulators compete for gestural and linguistic components of expression, it might seem unlikely at first sight that gesture production would figure prominently in sign languages. Some recent studies, however, argue that gestural components do play a role in sign production. This argument is based on the insight that sign languages exhibit modality-specific patterns and have – due to the visual-gestural modality – the potential to directly access imagistic, analog, iconic, or

spatio-temporal representations (e.g., Aronoff et al. 2003; Janzen/Shaffer 2002; Liddell 2003; Liddell/Metzger 1998; Rathmann/Mathur 2002; Talmy 2003; Wilcox 2004; Zeshan 2003). For example, the sign language structure that expresses that someone is standing at a certain location – an inverted -handshape located in the signing space – is more iconic to the event than the corresponding English expression “He is standing there” and thus might have more direct access to imagistic representations, as gestures do.

Thus, for exactly these modality-specific domains (i.e., for the expression of action and space), some researchers have suggested that gestural components exist in sign languages. In fact, the possible existence of ‘pantomimic’ gestures in sign languages has already been acknowledged by Klima and Bellugi (1979). In their view, sign languages utilize a wide range of gestural devices from conventionalized signs to mimetic elaboration on those signs, to mimetic depiction, to free pantomime. However, the proposal that gestural components akin to representational gestures in spoken languages also occur in sign languages is more recent. Some accounts of gestural components within sign languages will be sketched in the following three sections. We will first consider sequential and simultaneous manual and body gestures (sections 3.2.1 and 3.2.2) and then turn to non-manual gestures (section 3.2.3).

### 3.2.1. Sequential manual and body gestures

Emmorey (1999) has argued that signers may make use of “demonstrative gestures” or pantomimes which are expressed sequentially, that is, in alternation with signs. These gestures resemble demonstrations of quoted actions used by speakers as discussed by Clark and Gerrig (1990). Emmorey shows that, in order to quote actions of others, a signer may momentarily stop signing, go into a demonstration mode, in which he uses his face and body to visualize a character’s actions, and then resume the articulation of manual linguistic signs. In such cases, the signer produces signs and gestures sequentially, in a way similar to demonstrative or conventional gestures. In the American Sign Language (ASL) example in (7), a signer is describing a scene from the *Frog Story* in which a boy peers over a log, spots a group of baby frogs, and gestures to a dog sitting next to him to be quiet and to come over to the log (Emmorey 1999, 146).

- (7) LOOK/ come on, shhh, come on, thumb-point, well what? come on/ [ASL]  
 cl:TWO-LEGGED-CREATURES-MOVE  
 ‘Look over here. (gesture: come on, shhh, come on, thumb-point, well what? come on). The two crept over (to the log).’

In this example, the signer uses a series of conventional (emblematic) gestures enacted from the point of view of the boy to report what the boy says to the dog, such as *come on* and *shh* (‘be-quiet’ gesture); these gestures intervene between the sign LOOK and the classifier predicate.

Similar sequential alternations between signs and enactments of actions using full body demonstrations have been reported by Liddell and Metzger (1998). They refer to these enactments as “constructed actions” and point out that they are used mostly to shift between quoting actions of two different characters. However, it is still an

open question whether the use of such pantomimic actions during signing should be considered as gestural or linguistic because they might well be obligatory and serve dedicated syntactic functions such as role shift (Quinto-Pozos 2007).

### 3.2.2. Simultaneous manual and body gestures

According to a prominent current view, at least some gestural components in sign languages are similar to representational gestures found in spoken languages in that they are derived from imagery as suggested in cognitive models of speech and gesture (see section 2.2.1). According to this view, in sign languages, gestures can manifest themselves as blends, that is, as expressions in which gestural and linguistic elements are co-produced within a single sign (Liddell 2003; Liddell/Metzger 1998; Schembri/Jones/Burnham 2005). For example, in *indicating* (agreement) verbs and *depicting* verbs (classifier predicates), location and movement are considered gestural components while the handshape in both types of verbs is taken to be a linguistic morpheme. Liddell (2003) claims that the location and movement components of these verbs are analogical and gradient in nature rather than discrete and categorical (i.e. morphemic) since – due to their correspondence with mental representations of space (e.g., Duncan 2002; Liddell/Metzger 1998) – such verbs can exploit an uncountable number of locations and movements (the “listability problem”). Crucially, according to Liddell, the analogical and gradient use of locations and movements in these signs bears resemblance to how representational gestures accompanying speech represent location and movement: these components are derived from imagery as in McNeill’s theory of speech and gesture. Thus, Liddell concludes that one area where imagistic and gestural components co-occur in sign language lexemes is in the use of signing space, that is, in the movement and location component of indicating and depicting verbs.


Liddell’s claims have been subsequently tested in a study by Schembri, Jones, and Burnham (2005). The authors compared event descriptions given by adult signers of three sign languages (Australian Sign Language, Taiwan Sign Language, and ASL) to descriptions of the same events provided by English speakers (non-signers) in a condition in which they were only allowed to use their hands but not to speak. In particular, they compared the locations and movements of motion verbs and found that these two components were not only similar across the three sign languages but also in the silent gestures produced by English speakers. In contrast, it turned out that handshapes referring to entities were different in each sign language and also in the silent gestures. According to the authors, these findings confirm Liddell’s claim that the use of the signing space in these verbs is gestural while the handshapes (for instance, in classifier predicates) are linguistic.

Comparing the gesture production of hearing adults to the signing of deaf children, Casey (2003) found that hearing non-signing adults use space in a way similar to deaf children when depicting action scenes without speech. She interprets these similarities as evidence for the gestural origins of these sign language devices, due to the visual-gestural modality. In contrast to Liddell (2003) and Schembri, Jones, and Burnham (2005), however, she claims that her findings do not necessarily imply that these devices remain gestural at further developed, that is, further grammaticalized stages of a sign language. Supporting evidence for this assumption comes from the rapid grammatical-

zation as observed within only three generations in an emerging sign language in Nicaragua and the changes in the use of signing space resulting from this grammaticalization process (Senghas/Coppola 2001; see also chapter 36, Language Emergence and Creolization).

Interestingly, so far no research has directly compared co-speech gestures and sign language with respect to the use of locations and movements in depictions of motion and action (the research of Schembri et al. and Casey focused on gestures without speaking). In fact, if both gestures in sign languages and co-speech gestures arose from imagery, as suggested by Liddell (2003), then we would expect them to look similar. Furthermore, most research on gestural components in signs to date has focused on location and movement but has not compared representational modes between co-speech gestures and classifier predicates. For example, different modes of representations in co-speech gestures as proposed by Müller (2009; see (1) above) appear to correspond to different types of sign language classifier predicates in terms of their semiotic properties. In particular, the tracing mode bears similarities to Size-and-Shape Specifiers, the enactment mode corresponds to Handling classifiers, and the representation mode corresponds to Entity classifiers (see Zwitserlood (2003) and chapter 8 for discussion of sign language classifiers). In future research, it would be interesting to make a direct comparison of these representations as used in co-speech gestures and sign languages. Such a comparison may help us understand which aspects of the basic semiotic properties that the visual-spatial modality affords go through grammaticalization processes and which remain gestural in nature.

### 3.2.3. Simultaneous non-manual gestures: Gestures of the face and the mouth

Recently, Sandler (2009) has proposed that there is another domain in which sign languages might display gestural components akin to representational co-speech gestures, namely in the gestures expressed by the mouth and face. Since the mouth and face are articulators that can be used simultaneously with the manual articulators, they might provide yet another possibility for representational gestures and linguistic expressions to occur simultaneously, just as in co-speech gestures. In an analysis of renditions of the Sylvester and Tweety cartoon in Israeli Sign Language, Sandler identifies ways in which mouth and face movements are used to co-express information about the characters' actions in the cartoon that are at the same time idiosyncratic and complementary to the manually expressed information. For example, when a signer describes Sylvester going up through a long drainpipe to get to Tweety, his manual articulation consists of a -handshape entity classifier moving upward in a zigzag manner. At the same time, the narrowness of the drainpipe is represented by a mouth gesture (cheeks sucked in, lips pursed). The combination of manual and non-manual components yields the meaning that the cat went up through the narrow pipe zigzagging.

These findings show that even though mouth and face gestures might be 'gestural' in signers, the iconicity of these gestures is less transparent than that of representational gestures accompanying speech – mainly due to the constraints of mouth and face as a channel to express visual components. It is important to note here that if these components are gestural and not conventionalized, this supports the view that

gestural components need not be ‘iconic’ and can appear in any modality (Okrent 2002).

Finally, even though most research on sign and gesture has focused on representational gestures, it is also possible to observe gestures that are affective or evaluative expressions which simultaneously accompany manual signs, just as is the case in speech. Emmorey (1999, 151) provides the below (somewhat adapted) example of non-linguistic, gestural expressions of affect taken from an ASL rendition of the *Frog Story*. The facial expression of the signer (in italics) accompanying the linguistic signed expressions (within brackets) switches between the perspective of the bees (angry) and that of the dog (fearful).

- (8) LARGE-ROUND-OBJECT-FALLS. [CL:SWARM. MAD.] [ASL]  
*Eyes squint, angry expression*  
 [DOG CL:RUN.]  
*Tongue out, fearful expression*  
 [BEE CL:SWARM-MOVES.]  
*Eyes squint, angry expression*  
 ‘The beehive fell to the ground. The bees swarmed out. They were mad.  
 The dog ran away, and the bees chased him.’

### 3.3. Grammaticalization of gestures

Another area of sign language research has investigated how gestures that are used by people in the surrounding hearing communities can become integrated into the linguistic system of sign languages. While some studies have shown that such gestures with similar forms might still serve similar functions in the sign language used in the same region, others have tried to demonstrate that gestures of the hearing community may go through a process of grammaticalization in the sign language, thereby taking on new linguistic and pragmatic functions (see Pfau/Steinbach (2006, 2011) for a review; see also chapter 34).

Supporting evidence for the first claim comes from the fact that some sign language lexemes or grammatical devices resemble co-speech gestures used by speakers in the surrounding community. McClave (2001), for instance, has shown that speakers of American English execute slight shifts of the head and body to the right or left in direct quote situations similar to the *role shift* devices used in ASL (see chapter 17, Utterance Reports and Constructed Action). Thus she concludes that the role shift devices should be considered as “gestural” in the sign language. Zeshan (2003) argues that some of the Handling classifiers found in Indopakistani Sign Language show considerable variation and retain the same handshapes observed in the co-speech gestures used among speakers. She suggests, therefore, that these handshapes are more on the gestural than on the linguistic side when placed on a grammaticalization path.

As for the grammaticalization of gestures in sign languages, it has been proposed that this process may take two different routes (Wilcox 2007). In one route, gestures of the speaking community become lexicalized first, before, in a second step, acquiring a grammatical meaning. Janzen and Shaffer (2002), for example, claim that some modal

verbs in ASL (e.g. CAN) originate from gestures (i.e. the ‘strong’ gesture) which first became lexical signs (i.e. STRONG) before developing further into modals. In the second route, grammatical non-manual markers are grammaticalized directly from bound, non-manual communicative gestures (e.g. eyebrows up for yes/no-questions, headshake for negation) without going through a lexical stage. Once they enter the grammatical system, such markers may acquire additional grammatical functions. The eyebrow position typical of yes/no-questions, for instance, developed further into a topic marker in ASL (Janzen/Shaffer 2002). Even manual communicative gestures may develop directly into grammatical markers. The palm-up presentation gesture, for example, has taken on the function of a discourse marker in several sign languages (Engberg-Pedersen 2002; McKee/Wallingford 2011).

Finally, while most previous research has focused on the grammaticalization of conventional gestures used in the speaking community, recent research has investigated how motion predicates in emerging sign languages compare to representational gestures of motion in the speaking community. Within about 25 years and three cohorts of signers, expressions of simultaneous manner and path (e.g. climb up) developed linguistic patterning (segmented and analytic) in the emerging Nicaraguan Sign Language and moved away from the global and synthetic representation of co-speech representational gestures (Senghas/Kita/Özyürek 2004).

Thus, all types of gestures used in hearing communities can serve as the substrate for various lexicalization and grammaticalization processes in sign languages. The grammaticalization patterns, in particular, are informative with respect to the modality-specific and modality-independent aspects of grammaticalization processes (Pfau/Steinbach 2006, 2011).

## 4. Conclusion

This chapter has reviewed research on gestures in spoken languages and on the possible existence of similar gestural components in sign languages. Sign language research has identified different ways in which gestures might manifest themselves in signs, the different uses resembling emblematic, demonstrative, and representational gestures previously identified as accompanying spoken languages. Consequently, even though a continuum from gesture to sign exists in terms of conventionalization and emergence of linguistic features (see Table 27.1), different semiotic levels of the continuum also co-occur within sign languages, that is, signs and gestures can co-exist.

However, it is still a matter of debate whether the gestural components in sign and spoken languages are similar in terms of semiotic composition as well as in terms of their underlying cognitive representations (Emmorey 1999). According to Kendon (2008), the semiotic modalities of signs and speech are so different that it should be impossible to identify comparable gestural components in both language modalities, simply because gestures are integrated with different modalities of expression. For example, if the mouth can serve as an articulator for gestural representation in sign language (Sandler 2009), then gestures in sign would be less iconic than gestures in spoken languages, due to the different types of iconic mapping possibilities afforded by the hands versus the mouth. Thus, even though both signers and speakers might



use gestural components, these components might differ in the way they are manifested – or perhaps even be conceptualized (see Rathmann/Mathur (2002) for a proposal that gestural components might be more obligatory in the use of verb agreement in sign languages than in spoken languages because the visual-spatial modality as articulator is more closely linked to the imagistic aspects of conceptualization). The latter scenario seems highly likely given the finding that different spoken languages also make use of different co-speech gestures depending on the language-specific way of expressing and perhaps even conceptualizing event components (Kita/Özyürek 2003). It would also be interesting to investigate in future research whether signers of different sign languages use different representational gestures for the same content just as speakers of different spoken languages do.

To summarize, recent research clearly demonstrates that no matter which channel of transmission is preferred in different systems of communication, our human language capacity is multi-modal and is therefore able to convey information at different semiotic and representational levels. These initial studies make clear that further careful research is required to understand how gestural components can be identified in sign versus spoken languages and to facilitate further fruitful exchanges between gesture and sign language researchers. Finally, it is important to note that the field of gesture and sign language research is still in its initial stages and more research on co-speech gestures in different spoken languages and sign languages is needed to understand the fundamental features of our language faculty in its multi-modal form.

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