Body – Language – Communication

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132. Gestures and metonymy

Abstract

Gestures are inherently metonymic: they may profile salient features of objects, actions, events, concepts, or ideas that are particularly relevant to the speaker in a given moment of multimodal interaction. This chapter aims to account for distinct cognitive-semiotic mechanisms that seem to motivate instances of ad hoc abstraction in spontaneous gestural sign formation as well as guide processes of cross-modal inferencing during interpretation. It explores a range of semiotic practices that bring about the metonymic spareness and furtiveness characteristic of manual gestures and full-body reenactments. First Peircean, Jakobsonian, and recent embodied views on contiguity are discussed, laying out various contiguity relations and degrees of metonymic proximity between the communicating human body, its material and social habitat, and the virtual entities gesturing hands may seem to manipulate or the invisible traces their movements may leave in the air. Then a taxonomy of metonymic principles engendering predominantly indexical or iconic bodily signs, as well as transient cases will be presented. Finally, a set of underlying metonymic shifts and chains and their interaction with metaphor will be discussed.

1. Metonymic moments: Ad hoc abstraction in gesture

Gestures, like most other signs, tend to be partial representations and thus metonymic in one way or another. Accordingly, gestural sign formation implies, as most processes of perception and expression do, abstraction, that is, the singling out of salient features or decisive moments of entities, ideas, actions, or events — whether experienced many times before or imagined for the first time. Arnheim (1969: 117) describes the schematic nature of gestural gestalts as follows:

> Actually, the portrayal of an object by gesture rarely involves more than some one isolated quality or dimension, the large or small size of the thing, the hourglass shape of a woman, the sharpness or indefiniteness of an outline. By the very nature of the medium of gesture, the representation is highly abstract. What matters for our purpose is how common, how satisfying and useful this sort of visual description is nevertheless. In fact, it is useful not in spite of its spareness but because of it.

The aim of this chapter is to lay out a set of semiotic practices assumed to engender the metonymic "spareness" and furtiveness that is characteristic of spontaneous coverbal gestures and full-body enactments. Gestures often consist only of schematic figurations traced in the air, or minimal motion-onsets metonymically alluding to, or abstracting over, entire physical shapes, movement excursions, action routines, or the objects/tools

they involve. For instance, to convey to a friend sitting across the lecture hall that one will email her later, first one might enact typing action by holding both hands next to each other, palms facing downward, furtively moving some fingers up and down, and then slightly points an index finger in her direction. Based on her embodied experience and world knowledge, as well as the shared context, the addressee can easily infer a more precisely performed typing action actually producing text, the implied keyboard and other contextual elements, such as the material setting and the contiguous steps involved in using a computer and sending/receiving electronic messages. While this gesture sequence can be understood without additional speech information, most of the gestures discussed in this chapter are temporally, syntactically, and semantically integrated with the concurrent speech that serves to disambiguate the meaning of typically polyfunctional gestural forms and actions. Contrasting with fully coded signs and constructions in spoken and signed languages, which must adhere to certain well-formedness conditions to be correctly understood, coverbal gestures are created less consciously and most often "from scratch" (e.g., Mittelberg this volume; Müller 1998). This *ad hoc* potential for idiosyncratic expression contributes to the broad range of individual gesture styles. As we will see below, it also reveals a certain systematicity afforded through specific metonymic principles acting as constitutive driving forces in each instance of bodily sign formation. Motivated and subjective, the use of natural semiotic resources allows the gesturer to convey — more or less creatively — information from her own or other points of view (Cienki and Mittelberg 2013; Müller 2010; Sweetser 2012).

Metonymy in gesture has so far received much less attention than metaphor (e.g., Cienki 2012; Cienki and Müller 2008). Throughout this chapter various metonymic principles will be examined in light of the specific mediality and affordances of gestures. Metonymy here is understood as involving two entities pragmatically linked within the same experiential domain (e.g., Barcelona 2009) or frame (Fillmore 1982), one of which is profiled, allowing inference of the other element(s), e.g., a typing action may evoke a virtual contiguous keyboard as well as the ensuing email exchange. Metaphor, by contrast, involves a mapping between two different experiential domains (e.g., in *she easily got a grasp of the concept* the mental process of understanding is understood in terms of a physical action; Lakoff and Johnson 1980). Drawing on previous work on metonymy in co-speech gestures and bringing in insights from signed languages, this chapter will give an overview of how, in multimodal communicative acts, the human body and its visual action (Kendon 2004) provide not only dynamic iconic structure, but also different kinds of indices that may function as physical cues for metonymic inferences, thus putting speakers in touch with their imagination and the world around them. First, section 2 introduces various types of contiguity relations. In section 3, two distinct but interlaced routes of metonymically motivated gestural abstraction will be laid out, one primarily based on iconicity, the other primarily rooted in contiguity relations. Modes of interaction between metonymy and metaphor are also briefly addressed. Section 4 presents an overview of metonymic shifts and chains, and section 5 sketches possible avenues for further research.

2. Experiential anchorage: Material, physical, and conceptual contiguity relations

When examining how metonymy may manifest itself in co-speech gestures, combining semiotic frameworks not exclusively based on language (e.g., Jakobson 1956; Peirce

1960) with embodied approaches to language, cognition, and social interaction allows us to account for the specific nature of both verbal and bodily signs. These perspectives agree that meaning does not reside in the material form that a sign, such as a word or a gesture, takes, but arises in the dynamic multidimensional gestalt of a mental representation or some other kind of cognitive or physical response to a perceived sound, image, or human behavior. Metonymies are pervasive embodied processes of association and signification, rooted in entrenched multi-sensory experiences of perceiving, interpreting, and communicating (e.g., Gibbs 1994). Contiguity, a general relational concept introduced in this section, underpins most metonymic principles and has proven constitutive of gesture form (Hassemer et al. 2011) as well as cross-modal processes of meaning construction (Mittelberg 2006, 2010b, volume 1).

According to Peirce (1960), *contiguity* encompasses different kinds of factual connections: e.g., physical impact, contact and adjacency, as well as temporal and spatial closeness, or distance. All of these may underpin indexical sign processes, in which the sign carrier, e.g., fingerprints left at a crime scene, points the interpreting mind to the "object", e.g., the person whose fingers caused the imprints through physical impact. Grammatical function words such as personal pronouns and demonstratives are indexical linguistic signs ― or *shifters* (Jakobson [1957] 1971) − whose highly context-dependent meanings include factors of the speech event, shifting in each instance of use. As we will see below, not only highly indexical gestures (such as *deictics* or *beats*; see McNeill 1992), but also gestures (re)presenting some content are polysemous, multifunctional signs that share this property in striking ways.

Within cognitive linguistics, contiguity relations feeding into metonymic expressions are thought of as either objectively given or cognitively construed (e.g., Barcelona 2009; Benczes et al. 2011; Dirven and Pörings 2002; Peirsman and Geeraerts 2006); they further are assumed to be contingent (Panther and Thornburg 2003). As for bodily semiotics, the latter aspect seems pertinent, for a gesture is, in most cases, just a gesture because gesticulating hands do not manipulate physical objects or surfaces but only pretend to do so (as in the email-typing gesture described above). Hence, the original contiguity relation within the functional domain of hands typing on a keyboard is cancelled. This letting go of the material world turns a transitive manual action into a more abstract communicative hand movement, from which virtual objects, tools, surfaces, and their affordances often may still be inferred (Grandhi, Joue, and Mittelberg 2012). Crucially, gesturing hands may not only reflect their groundedness in everyday interaction with the material world, but also (re-)establish indexical anchorage of the body and the mind in the here and now by seeking tactile contact with the environment and integrating artifacts and surface structures into meaningful actions often collaboratively constructed with interlocutors (e.g., Enfield 2011; Goodwin 2007; Haviland 2000; Streeck 2009).

Jakobson (1956) distinguished between contiguity relations in the physical world, e.g., between a fork and knife, and those combining items in a *semiotic contexture*, e.g., linguistic units forming syntagms or entire discourses (Waugh and Monville-Burston 1990). In the emailing gesture, the iconic typing action and the indexical gesture hinting at the receiver jointly constitute a gestural syntagm (Mittelberg 2006). In addition, the two modalities, and others such as eye-gaze and head movements, contextualize one another (Jakobson 1963). Of central importance in the present context is Jakobson's distinction between "inner contiguity", i.e. synecdoche, and "outer contiguity", i.e. what he called "metonymy proper":

> One must − and this is most important − delimit and carefully consider the essential differ-
> ence between the two aspects of contiguity: the exterior aspect (metonymy proper), and the
> interior aspect (synecdoche, which is close to metonymy). To show the hands of a shepherd
> in poetry or the cinema is not the same as showing his hut or his herd, a fact that is often
> insufficiently taken into account. The operation of synecdoche, with the part for the whole
> or the whole for the part, should be clearly distinguished from metonymic proximity. [...]
> the difference between inner and outer contiguity [...] marks the boundary between synecdo-
> che and metonymy proper. (Jakobson and Pomorska 1983: 134)

From these observations one can recognize two fundamental contiguity relations as the
basis of distinct metonymic operations: a) inner contiguity underlies inherent part-whole
relationships, i.e. synecdoche (e.g., *in thirty sails appeared at the horizon,* sails evokes
vessels); b) outer contiguity underpins metonymic expressions in which the profiled el-
ement is not part of, but externally contiguous and pragmatically related to, the element
it causes us to infer (e.g., a vessel shown in a film scene may evoke the crew inside it).
In the section below, we will review work exemplifying how these different relations may
motivate cross-modally achieved metonymic expressions in co-speech gesture.

3. Internal and external metonymy in manual gestures and full-body (re-)enactments

Given their dynamic visuo-spatial mediality, gestures can be expected to be differently
metonymic and iconic than (spoken) language (Müller 1998; Sonesson 1992; Waugh
1993). As work on metonymy in gesture has shown, synecdoche plays a central role in
gestural sign formation (Bouvet 2001; Ishino 2007; Müller 1998; Taub 2001; Wilcox
2004). The goal of this section is to demonstrate that while the principle of partial repre-
sentation is an essential driving force, communicating hands also exploit various forms
of "metonymic proximity" between the body and the contiguous outer world (Jakobson
and Pomorska 1983: 134). Building on a recent Jakobsonian account of distinct met-
onymic operations in gesture, i.e. internal and external metonymy (Mittelberg 2006,
2010b, volume 1; Mittelberg and Waugh 2009), the underlying fundamental distinction
between inner and outer contiguity will serve as a blueprint for the following discussion
on metonymy in manual gestures and full-body enactments. Where pertinent, connec-
tions to cognitive linguistic accounts will be drawn. It's important to note that these
principles mix to various degrees in dynamic multifunctional gestural signs and that the
gesture analyst always needs to identify, in light of the speech content, the dominant
force determining the gesture's primary focus and function.

3.1. Internal metonymy: Wholes, parts, and essence

Internal metonymy relies on the kinds of inner contiguity relations that underpin the
pars-pro-toto principle: a part stands for another part; a part for the whole; or a whole
for the part. For example, in the expression *everyone lives under one roof,* roof stands
for the entire house of which it is a physical fragment. Thus, what is generally known
as synecdoche is subsumed under internal metonymy. "Internal" suggests that the inner
structure of an entity, body, or event is broken down into its component parts or phases,
and that one of them (e.g., the *roof,* or the shepherd's hand in Jakobson's example above)
is taken to imply the entire gestalt structure (e.g., the *house,* or the *shepherd*). Such

relations also link parts and wholes in abstract structures such as schemas, frames, or constructions (e.g., Mittelberg 2006).

In bodily semiotics, internal metonymy may motivate processes of profiling and highlighting prototypical or locally salient aspects of, e.g., a given concept, object, action, or event. Gesturers may evoke parts, contours, geometric shapes, spatial dimensions, the manner of motion, and other qualities of what they are talking about and wish to accentuate. Just as visual perception is an active selective process, gestures may assist speakers in "grasping the essentials" (Arnheim 1974: 42) of, for instance, a witnessed scene, a cognitive percept (Bouvet 1997), or abstract thought processes. According to Shapiro (1983: 201), this metonymic singling out or individuation of recognizable features and patterns "is perceptually and/or cognitively well-motivated (natural)". Johnson (2007: 92) reminds us that "[i]t is our ability to abstract a quality or structure from the continuous flow of our experience and then to discern its relations to other concepts and its implications for action that makes possible the highest forms of inquiry of which humans are uniquely capable." As we will see below, gestures are a means to draw on both conceptual relations and their implications for action.

The following typology aims to encompass a range of gestures, in which metonymy interacts with iconicity to various degrees; hence, the choice of ICON as a base term. Using "metonym" instead would not work as well, as most gestures are always metonymic in some way. Another concern is to mark the semiotic difference vis-à-vis gestures more strongly based on outer contiguity (see indices listed in section 3.2 and Mittelberg [this volume] on Peirce's notions of iconicity and ground). Since gestures may depict, or create, all kinds of "objects" in the Peircean sense, i.e. physical and non-physical entities, the labels primarily reflect bodily characteristics and actions. The discussion proceeds according to Peirce's (1960: 135) subtypes of icons: image icons, diagrammatic icons, and metaphor icons. Importantly, these cognitive-semiotic modes do not represent absolute categories, but interacting dynamic processes of profiling relevant features by making them stand out within complex semiotic gestalts.

BODY POSTURE/BODY ACTION IMAGE ICON. In these gestures, a body (part) stands for a body (part) and (re-)enacted bodily action stands for bodily action of the same kind: so, body postures may mimic body postures (e.g., standing or leaning forward), bodily actions imitate bodily actions (e.g., grasping, running, or dancing), head movements imitate head movements (e.g., nodding), and hands represent hands (e.g., waving). Gesturers may imitate their own (performed or imagined) actions or those of others (see McNeill 1992; Sweetser 2012 on viewpoint). Such gestural portrayals tend to be inherently metonymic in both their reduced articulation and temporal impermanence, since in ongoing conversations there is just enough time to share quick gestural glimpses at crucial aspects of what is being conveyed or not readily expressible through speech. For an example of a BODY ACTION IMAGE ICON, consider Fig. 132.1 below (taken from an interview on ArchRecordTV, January 5, 2011; see Mittelberg 2012). Here the British architect Norman Foster enacts a fictive scene based on his own experience with architectural space he himself designed (i.e. the Sperone Westwater Gallery, Manhattan). In this multimodal performance, Foster imitates someone entering the building and being taken by surprise. Assuming character viewpoint, he mimics looking and pointing up at the bottom of the elevator installed just above the museum's lobby. He is visibly amused by the thought of this architectural effect: ...*because the last place you think you'd ever really want to be in any building is underneath the elevator.* Via internal metonymy, this IMAGE

Fig. 132.1: *underneath the elevator* (BODY ACTION IMAGE ICON)

ICON portrays only a few essential aspects of the full actions they allude to, and several incorporated indices guide viewers' attention upward to the imagined elevator.

In the second example (taken from Mittelberg's [2006] multimodal corpus of linguistics lectures in American English), a professor introduces the concept of semantic roles (Fig. 132.2): *To account for this… we use names of semantic roles that bounce around in linguistics… agent, patient, recipient, goal, experiencer… those are semantic roles.* On the mention of recipient she produces a palm-up open hand (Müller 2004) with slightly bent fingers held near her right hip. *Recipient* designates a particular semantic role, i.e. a grammatical function, which the teacher personifies with her entire body by becoming a BODY POSTURE IMAGE ICON, slightly abstracted and idealized, of a person who could be holding something she received (via a person-role metonymy; Panther and Thornburg 2004: 94). Whether her open hand is meant to be supporting an object or to signal readiness to receive something is left unspecified. Although not operationalized here, we can assume a latent outer contiguity relation between the palm and a potential object. Internal metonymy further interacts with metaphor, that is, personification. A gesture that can be classified as a BODY ACTION IMAGE ICON is described by Bouvet (2001: 89): retelling La Fontaine's fable of "the crow and the fox" in French, the speaker performs a stylized bimanual grasping action with thumbs and fingers snapping several times at shoulder height when saying that 'the two men catch the fox' (*les deux hommes attrappent le renard*). Hence, the focus is on the men and their physical actions and not on the fox implied in their actions.

Fig. 132.2: *recipient* (BODY POSTURE IMAGE ICON)

BODY-/HAND-AS-OBJECT IMAGE ICON. This metonymic process draws attention to the speaker's entire body or a body part used to stand for something other than itself: e.g., a concept or an object as such, an entity or person undergoing a motion event (i.e. an intransitive action), or a tool performing an object-oriented (i.e. transitive) action. Hands, when becoming objects, persons, or tools, are inseparable from the action they are involved in; very abstract instances are better described as ABSTRACT ACTION IMAGE ICONS (see below). More prototypical instances of HAND-AS-OBJECT IMAGE ICONS, however, involve the gesturer's hands profiled against the entire body based on a *pars-pro-toto* relation (see Calbris 1990 on body segments). A cupped hand, for instance, may imitate a sort of recipient (Mittelberg 2008), an index finger held horizontally and close to the mouth may stand for a toothbrush (Lausberg et al. 2003), or a flat palm-up open hand may represent a piece of paper (Müller 1998: 123). A flat palm-vertical open hand may further become a blade, i.e. a HAND-AS-TOOL ICON, performing virtual cutting actions on an imagined fruit (Grandhi, Joue, and Mittelberg 2011). In American Sign Language (ASL), the lexical sign for tree is a bimanually achieved image icon encoding the salient elements of a tree: its trunk, branches and the supporting ground (Taub 2001: 29). Bouvet (1997: 17) describes how a little boy uses his entire body to imitate a helicopter, thus bringing out its prototypical form features and movements. His torso represents the helicopter's core and his arms the two opposite rotors circling around their axis. In this BODY-AS-OBJECT IMAGE ICON, the boy becomes a helicopter in action.

ABSTRACT ACTION/PROCESS IMAGE ICON. In this kind of gestural abstraction the action itself is foregrounded, and the things or persons possibly involved in it are backgrounded: "The abstractness of gestures is even more evident when they portray action. One describes a head-on crash of cars by presenting the disembodied crash as such, without any representation of what is crashing [...] and a clash of opinions is depicted in the same way as a crash of cars" (Arnheim 1969: 117). ABSTRACT PROCESS ICONS subsume gestures metonymically distilling the essence out of cognitive or physical processes such as iteration, continuation, correlation, or merging, by abstracting away from the elements or ideas undergoing the process, or performing the action (see Bressem [volume 1] for additional motion patterns; Ladewig [2011] on the cyclic gesture; and Mittelberg [2010a, 2013] on image schemas and force dynamics in gesture).

LINE/FIGURE/PLANE/VOLUME IMAGE ICON. Gestures of this type produce lines, figurations, planes, or volumes that are, no matter how abstract and evanescent they might be, iconic signs in their own right. Hands may trace a belt in the form of a traverse line at waist level (Calbris 1990: 39), draw an entity's shape such as a rectangular picture frame (Müller 1998: 119), or evoke the width of a building (Mittelberg this volume). They may also depict the pertinent qualities of the path and/or manner of a motion event. For an example of a LINE IMAGE ICON, consider Fig. 132.3 (taken from Mittelberg 2006): the linguist produces a tracing gesture by moving both her hands laterally outward from the center until her arms are fully extended. The concurrent utterance − *we think of a sentence as a string of words* − not only determines that this polysemous gestural line-drawing depicts a sentence, it also shifts the focus from the bodily action of tracing to the contiguously emerging virtual line. While this shift is triggered through an index leading from the tips of her hands to the trace they produce, it is via internal metonymy that this sketchy imagined line is an image icon of a *string* standing for a complete (written) sentence (see Taub 2001:77 for path iconicity in ASL). Virtual three-dimensional gestalts may also emerge from underneath sculpting hands: there also is

Fig. 132.3: *a string of words* (LINE IMAGE ICON)

immediate outer contiguity between the hands and the material they mold (Müller 1998) into A VOLUME IMAGE ICON (see also HAND-SURFACE INDEX below).

DIAGRAMMATIC ICON. Gestural graphs and diagrams are abstract schematic representations that bring out the internal structure of a gestalt by highlighting the boundaries between its parts or how the elements are connected. Such highly metonymic "icons of relation" (Peirce 1960: 135) combine, like many conceptual image schemas (Johnson 2007), inner and outer contiguity relations in various ways (Mittelberg 2008, 2010a, volume 1).

METAPHOR ICON. All the modes of internal metonymy presented above may interact with metaphoric processes. In fact, from the perspective of the interpreter, metonymy has been argued to lead the way into metaphor (Mittelberg and Waugh 2009). Note the crucial difference between gestural IMAGE ICONS of metaphoric linguistic expressions, such as the *recipient* (Fig. 132.2) and the *string of words* (Fig. 132.3), and speech-independent METAPHOR ICONS manifesting a metaphorical understanding in their own right. Mittelberg (volume 1: 764) describes a METAPHOR ICON in the form of a cupped palm-up open hand produced by a linguist when explaining the grammatical category *the main verb*. Through internal metonymy the hand shape iconically portrays essential form features of a small container which builds the basis for the metaphorical mapping CATEGORIES ARE CONTAINERS (Lakoff and Johnson 1980). Hence, whereas the speech is technical and non-metaphorical, the gesture modality evidences a metaphoric construal (see also Cienki and Müller 2008; Evola 2010).

3.2. External metonymy: Contact, containment, manipulation, and exploration

External metonymy involves various kinds of outer contiguity relations, e.g., contact, adjacency, impact, and cause/effect (Jakobson and Pomorska 1983). For instance, in *The White House remained silent*, the White House refers to the U.S. President or his spokesperson. The relevant contiguity relations, i.e. between the building or institution and its inhabitants or members, are spatial and pragmatic in nature; the people in the building are obviously not part of its architectural structure (like the roof in the example for internal metonymy). House and people belong to the same frame (Fillmore 1982). Or, if the question *would you like another cup*? is used to ask the addressee if she cares for more tea, the container *cup* stands for its contents, i.e. tea, which is not part of the material structure of the container cup. This CONTAINER-FOR-CONTAINED metonymy evokes the tea-drinking frame with all its pragmatic implications and socio-cultural conventions.

In multimodal interaction, the speakers' hands may create containers, surfaces, as well as chunks of or points in space for imagined entities which in turn may stand for

the concepts or things talked about and "shown" to interlocutors (Kendon 2004; Müller 2004). Outer contiguity relations not only condition the body's tactile, sensory-motor interaction with the physical and social world (section 2); they further hold between the outer shell of a person's body and the inner self, e.g., the organs, the brain, and the mind. In particular, contact, adjacency, and impact are external relations between hands and the objects, tools and surfaces they are in touch with that may be highlighted, established, or deleted through metonymic modes operating on them. The following typology spans different types and degrees of body-centered "metonymic proximity" (Jakobson and Pomorska 1983: 134). Since in these cases indexicality dominates over iconicity, the base term for the cognitive-semiotic principles is INDEX (see also Mittelberg volume 1).

AWAY FROM BODY INDEX (POINTING). Pointing gestures are included in the taxonomy as examples of prototypical or highly indexical signs based on an outer contiguity relation between the tip of the pointing finger or hand and the more or less distant target (concrete or abstract) of the pointing action (e.g., Fricke 2007; Kita 2003; Talmy 2013).

PLACING INDEX. This gestural practice is used to literally place things or people referred to in speech in gesture space, thus creating placeholders that either underpin the introduction of a new discourse element or facilitate anaphoric reference. Placing may be performed with one hand or both hands, but typically with the palm facing down (PDOH) or away from the body. A speaker might also simply point with his index finger into the space in front of him, thus setting up a point or location that metonymically stands for something else (Clark 2003; Cooperrider and Núñez 2009; McNeill 2005; Mittelberg 2006).

INTERACTIVE DISCOURSE INDEX (POINTING AT INTERLOCUTORS; DISCOURSE CONTENTS; COMMON GROUND). These indices underpin various interactive practices of pointing towards conversational partners, audiences, or discourse contents, e.g., citing, seeking, delivery, or turn coordination (Bavelas et al. 1995). For example, Bavelas et al. (1995: 396) describe "general citing" gestures as typically involving a loose palm-up open hand directed towards an interlocutor "to cite the addressee − that is, to acknowledge an earlier contribution the addressee made". In processes of metonymic inferencing (e.g., Langacker 1993; Panther and Thornburg 2003), interactive discourse indices may lead the interpreting mind to an intended target meaning, e.g., something an interlocutor did or said before, or an emotional response he or she displayed while listening. Common ground (Clark 1996), i.e. shared knowledge and experiences, may also be pointed at in this fashion. How exactly metonymic principles guide the interpretation of these interactive practices, or multimodal pragmatic acts, still needs to be investigated.

BODY PART INDEX. This kind of external metonymy comes to bear in gestures that derive their meaning partly from their contact with, or proximity to, particular body parts or regions (e.g., the lower back) or a particular organ (e.g., the heart). The gesture depicted in Fig. 132.4 is a bimanual body part index directed at the speaker's temples; it co-occurs with *knowledge* in the verbal utterance *Grammar emerges from language use, not from knowledge becoming automatized.* While pointing, the two cupped hands constitute a container attached to the head, i.e. the site of *knowledge*, thus mirroring the fact that the head is metaphorically construed as a CONTAINER that stands metonymically for its CONTENTS. Getting to the latter takes two steps along an inferential pathway (e.g., Barcelona 2009; Panther and Thornburg 2003), guided by external metonymy through first drawing on the outer contiguity between the hands and the head and then between

the head and its insides. Body-part centered metonymic processes are also productive in signed languages (see Mandel 1977: 63; Wilcox [2004: 213] for the sign THINK; Dudis [2004] on body partitioning).
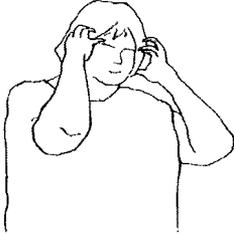

Fig. 132.4: *knowledge*
(BODY PART INDEX)

Fig. 132.5: *noun* (HAND-OBJECT
INDEX; SUPPORT)

HAND-OBJECT INDEX (SUPPORT; CONTAINER). In gestures involving open, cupped or closed hands, palms may appear to be literally "in touch" with the imagined "objects" they seem to be supporting, holding, or otherwise manipulating. The palm-up open hand gesture (Müller 2004) in Fig. 132.5 is a good example of how the principle of external metonymy is instantiated through an interaction with the concurrent speech content. In fact, it often is the speech content that justifies assuming something like an "object". Explaining the framework of emergent grammar, the speaker maintains that *a priori [...] you cannot define a noun from a verb*. On *noun*, this palm-up open hand constitutes a perceivable surface, i.e. a material support structure, for the abstract category *noun*, metaphorically reified as a graspable object (Mittelberg 2008). Importantly, iconicity and metaphor alone cannot account for this gesture's meaning. While the person may serve as a BODY ACTION IMAGE ICON similar to the one in Fig. 132.2, there is no similarity relationship between the person and the grammatical category mentioned in speech. Rather, an imputed immediate contiguity relation (contact/adjacency) between the open palm and the implied element becomes significant: the word *noun* draws attention from the action to the entity to be inferred metonymically. The indexicality residing inside such manual signs propels, together with other discourse-pragmatic factors, a sort of reduced indicating function, as if the speaker was pointing to the existence of otherwise intangible ideas or entities (see Liddell [2003] on surrogates in ASL).

HAND-TOOL INDEX (WITH/OUT IMPLIED OBJECT). This indexical principle allows differentiating gestures involving an object from those involving a handheld tool with which an action is, or may potentially be, performed. In their study on transitive action gestures, Grandhi, Joue, and Mittelberg (2011) found that participants describing everyday actions tend to produce gestures in which the dominant hand seems to be handling (i.e. not iconically representing as in HAND-AS-TOOL ICON) the tool required for a particular action. Slicing an apple, for instance, necessitates both an object (apple) and a tool (knife). While explaining, *you need to slice the apple by holding it down and cutting it there*, one participant pretends to be holding a knife in her right hand (HAND-TOOL INDEX), as shown in Fig. 132.6, while pantomiming a cutting action on a virtual apple she is seemingly holding down with her left hand (HAND-OBJECT INDEX). The speech content draws attention to both the action and the object, but not to the tool. All three elements

belong to the same experiential domain or frame. Taken as a whole they represent a BODY ACTION IMAGE ICON that can be broken down in the sense that two indices point to external elements, one of which (the object) is profiled by the speech content and the other (the tool) can be easily inferred from the context (see section 3.1).
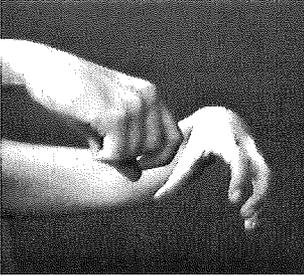

Fig. 132.6: *slicing an apple* (left hand: HAND-OBJECT INDEX; right hand: HAND-TOOL INDEX)

DOUBLE HAND-OBJECT INDEX (ENCLOSING; GROUPING; SCULPTING). These gestures exhibit similarly muted indexical functions as the ones we just saw. Yet, by employing two articulators, e.g., two fingers or two hands, they provide more iconic information regarding the geometry and size of the "object" they seem to be holding or the chunk of space they enclose. The person in Fig. 132.7 is explaining the short sentence *Diana fell*. Upon mentioning the verb *fell*, the thumb and index finger of his right hand seem to be holding it up in the air, conceptualized as a tangible object or as space extending between the articulators. Again, if we only considered the visible gestural articulators as the semiotic material of this gesture, we could not establish a meaningful relationship with the verb *fell* (no falling event is depicted, either). But this BODY ACTION IMAGE ICON provides indexical cues drawing on the immediate outer contiguity (contact) between the observable gestural components and the imagined element thus seized. Through the linguistic cue *fell*, this tight contiguity relation is operationalized via external metonymy.

The bimanual gesture depicted in Fig. 132.8 combines iconic and indexical modes in a rather balanced fashion. Here the speaker talks about main verbs and auxiliaries, explaining that verbs like *have, will, being, and been [...] must all belong to some subcategory*. Upon *some subcategory* he makes this gesture, consisting of two hands seemingly holding a virtual three-dimensional object. While there is an iconic relationship (via

Fig. 132.7: *fell*
(DOUBLE HAND-OBJECT INDEX)

Fig. 132.8: *subcategory*
(DOUBLE HAND-OBJECT INDEX)

internal metonymy) between the physical action of holding something and this gestural imitation (BODY ACTION IMAGE ICON), the speaker is not referring to his action but to the object involved in it. So the linguistic cue triggers the activation of the outer contiguity relation between the hands and the adjacent virtual object, which results in a cross-modal metonymic expression. This association works effortlessly, also on the side of the interpreter, because action and object belong to the same basic experiential domain or frame. Moreover, the gesture's comparatively low location in gesture space reinforces the idea of *subcategory*. Since it receives some of its meaning from its marked position, this also is a gestural instance of metonymy of place (Mittelberg and Waugh 2009). Variants of such bimanual indices may also function as the visible starting points for creating (not holding) imaginary three-dimensional objects, e.g., VOLUME IMAGE ICONS (section 3.1). DOUBLE HAND-OBJECT INDICES may also be instantiated by hands seemingly involved in enclosing or grouping virtual items in gesture space.

HAND-SURFACE INDEX (TOUCH; EXPLORATION). Immediate outer contiguity relations between open hands and the surfaces they pretend to touch or run across may come into focus in gestures seemingly exploring the texture of fabrics, the surface of a piece of furniture, or some ground. Note the difference between this tactile gestural practice of interacting with the material world, e.g., by sensing or pointing at some of its prominent attributes, such as smoothness or bumpiness, as opposed to HAND-OBJECT INDICES alluding to hand-held objects or tools, or, image icons created by hands and their movements (Müller 1998; Streeck 2009).

HAND-TRACE INDEX (IMPACT; EFFECT; WITH/OUT RESULTING ICON). If virtual movement traces do not constitute iconic signs, that is, if they do not create or represent something other than themselves, then the focus may be on their "impact", e.g., their leaving some sort of mark. What is profiled in these cases is the outer contiguity relation between perceivable gestural articulators, e.g., the index finger or the entire hand, and the resulting inscriptions in the air or on surfaces (Goodwin 2007). In fact, this is the first step leading into the creation of LINE IMAGE ICONS (section 3.1). If indexicality is the dominant function, however, these marks compare to animal footprints in the snow, a classic example of indices also involving some iconic features.

MODAL INDEX (EPISTEMIC STANCE; ATTITUDE). Muted degrees of indexicality may also reside in palm-up open hand variants implying empty hands or no object-oriented aspects at all (as opposed to HAND-OBJECT INDICES). Different kinds of expressive movements and facial expressions may reveal the speaker's attitude, or epistemic stance towards what she (or an interlocutor) is saying: e.g., doubt, uncertainty, obviousness, or cluelessness. Interlocutors pick up on such indices that may add modal, i.e. pragmatic functions to a gestural portrayal also representing some content (Cienki and Mittelberg 2013; Kendon 2004; Müller 1998).
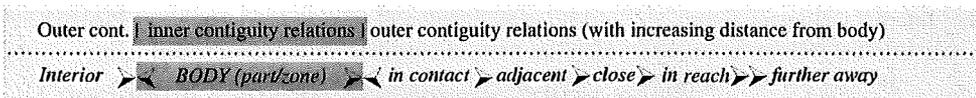
EMOTIONAL/MENTAL STATE INDEX. Expressive movements may also be motivated by − or simply *be* − psychological or emotional states. Although they are comparable to vocalizations signaling, e.g., surprise or impatience, in gesture these indices are incorporated into bodily (iconic) structure. The *pathos formula* described by art historians stands for states of strong affect manifesting themselves, e.g., in statues of Laocoon struggling with a sea snake sent by Neptune (e.g., Gombrich 1960). Such central figures of Western iconography seem still to resonate in today's gestural practices. Captured outbursts of emotion like these are BODY POSTURE IMAGE ICONS with incorporated EMOTIONAL STATE INDICES physically displaying an inner disposition. Similarly, iconic and indexical modes

may jointly produce a unified corporeal portrayal, signaling, e.g., a speaker's surprise or agitation about something s/he is talking about, e.g., as in Fig. 132.1 (Müller 1998). Listeners may also respond in physical ways, thereby displaying, e.g., empathy. These behaviors add a sense of drama to everyday performances in conversations but are more prevalent on stage (Brandt 2004). Crucially, this kind of indices come *from within* the body icons and seem to simultaneously point back inward, thus offering cues about the speaker's inner state. HAND-OBJECT INDICES, on the contrary, focus on the speaker's acting hands, thus leading the interpreter's mind into contiguous material or imagined worlds (for metonymic relations between specific movement qualities and emotions in ASL see Wilcox, Wilcox, and Jarque [2003]).

4. Cross-modal patterns of meaning construction: Metonymic shifts and chains

Coming back to the fundamental distinction between inner and outer contiguity rela-tions stressed by Jakobson (Jaksobson and Pomorska 1987), one can now step back and look at the bigger picture, which reveals gesture-specific tendencies in exploiting them for communicative purposes. From the range of gestural actions and postures presented above, a set of underlying metonymic patterns seems to emerge. Each pattern involves one or several stages evolving along an axis originating from the speaker's body engaged in metonymically reduced communicative postures, movements, or actions. Interlocutors may first recognize a certain kind of action based on similarity relations with action schemas or typical postures, but may also witness creative extensions or new forms and behaviors that do not fit into conventional patterns. From the visible body as physical anchor point, the axis extends on the one side to the speaker's inner world and on the other to the speaker's outer world, passing through two body-centered outer contiguity relations: *(interior world) inner body* ← *BODY* → *outer body (exterior world)*. Breaking these relations down further we arrive at the following spectrum, ranging from inner states, body parts, and physical actions to body contact (i.e., immediate contiguity; Ja-kobson and Pomorska 1983: 134) and varying degrees of increasing metonymic distance. In Tab. 132.1 below, the zone of physical inner contiguity relations is shaded in a darker grey than the zones of outer contiguity relations. The two opposing arrows to each side of the BODY are meant to highlight the fact that some indices may point from the inner body outward and others from the outside towards the inside:

Tab. 132.1: Axis of body-centered inner and outer contiguity relations exploited for co-speech ges-tures

Outer cont.	inner contiguity relations	outer contiguity relations (with increasing distance from body)
Interior ➤◄	*BODY (part/zone)* ➤◄	*in contact* ➤ *adjacent* ➤ *close* ➤ *in reach* ➤➤ *further away*

These ordered relations are assumed to provide the structural backbone for the set of distinct patterns of metonymic principles and chains presented in Tab. 132.2 below. Situ-ated at a higher level of abstraction, they may motivate the various kinds of icons and indices (and their interaction) discussed in detail in section 3.

As the patterns presented in Tab. 132.2 suggest, internal metonymy, i.e. an icon of a human body, is always the point of departure for an ensuing metonymic operation or chain of operations. Pattern (A) accounts for, e.g., motion onsets or schematic movements alluding to full action routines (BODY ACTION IMAGE ICONS), or hands standing for objects or tools (e.g., HAND-AS-OBJECT/TOOL ICONS). Pattern (B) involves bodily actions with noticeable expressive qualities, thus pointing to the inner disposition, attitude, or epistemic stance of the speaker or the person s/he mimics (e.g., BODY ACTION IMAGE ICONS incorporating MODAL INDICES or EMOTIONAL STATE INDICES). Pattern (C) involves two metonymic steps: from the speaker's pointing hand to the location pointed at on her body and from that location to some invisible inner organ, process, or sensation interlocutors cannot perceive but imagine or "feel for" the speaker (e.g., BODY PART INDEX). Here pattern (D) is exemplified by revisiting McNeill's (2005: 114) well-known "bowling ball" example in which a speaker retells a sequence of the Canary Row cartoon story by saying that *Tweety Bird runs and gets a bowl-*

Tab. 132.2: Metonymic principles and chains in manual gestures and full-body enactments

Metonymic principles and chains	*Attention focus* within inner contiguity bounds *Attention shift* across outer contiguity relations	Examples
A Internal metonymy (ICON) metaphor	*Attention stays within body icon:* Focus on body: salient features of a part, zone, shape, movement, or action	Fig. 132.2

B   Internal metonymy (ICON)
     inherent INDEX
     metaphor
	Attention stays within body icon:
	Focus on body: salient features of a part, zone, shape, movement, or action
	& movement qualities, or mimics manifesting inner disposition (e.g., emotion; attitude; stance)
		Fig. 132.1

C   Internal metonymy (ICON)
     external metonymy (INDEX)
     external metonymy (INDEX)
     metaphor
	Attention shifts inward:
	Hand ➤ body part or location on body
	➤ adjacent inner area, organ, sensation, process
	(e.g., head ➤ thought process)
		Fig. 132.4

D   Internal metonymy (ICON)
     external metonymy (INDEX)
     metaphor
	Attention shifts outward:
	Hand ➤ (real/virtual) space/object/tool person/surface/entity in metonymic proximity to body (in immediate contact; adjacent; close; distant; etc.);
	including interlocutors, discourse contents and common ground (e.g., interactive/pragmatic functions)
		Fig. 132.5
		Fig. 132.6
		Fig. 132.7
		Fig. 132.8

E   Internal metonymy (ICON)
     external metonymy (INDEX)
     internal metonymy (ICON)
     metaphor
	Attention shifts onto emergent icon:
	Hand ➤ parts of emerging virtual trace/plane/volume; infer from parts the whole gestalt created contiguously to body (ICONS in their own right)
		Fig. 132.3

Note: All patterns are cross-modal (speech cues are not listed here). All metonymic processes and chains may be extended by additional metonymic modes; they may also lead into metaphorical extensions. The icons produced by pattern (E) may manifest as IMAGE, DIAGRAMMATIC, or METAPHOR ICONS.

ing ball and drops it down the drainpipe. Through his speech and bodily portrayal the speaker draws the listener's attention to both the physical action and the implied object. It is first via iconicity and internal metonymy that we recognize a person performing a bimanual downward dropping action; second, via external metonymy we can pragmatically infer, i.e. imagine, the ball contiguous to the hands as well as the ball's ensuing trajectory and possible effect on Sylvester. This gesture thus is a BODY ACTION IMAGE ICON with an implied DOUBLE HAND-OBJECT INDEX that sets off a metonymic chain (see Brdar-Szabó and Brdar [2011] on metonymic chains in language). Finally, pattern (E) may be observed if the gesturer's body and action are not in focus, but − cued by the concurrent speech − attention is drawn to a fictive schematic iconic figuration resulting from the manual tracing or sculpting movements (e.g., VOLUME IMAGE ICON or DIAGRAMMATIC ICON). Note that all of the metonymic principles and chains given in Tab. 132.2 depend on where attention is drawn to by the concurrent speech; they all may also lead into metaphor (Mittelberg and Waugh 2009).

What is common to these cross-modal patterns is that for the interpreting interlocutor they provide metonymic moments that mediate meaning not only depending on what the speaker is trying to convey and emphasize, but also on the interpreter's own modes of attending to aspects relevant to her/him. Interpreting bits and pieces of salient (abstracted) information in a dynamically evolving semiotic context and incorporating them into a (metonymically) structured whole requires a combination of several embodied cognitive processes, particularly those pertaining to focusing and shifting attention: zooming in on partial aspects of the communicating body, e.g., by focusing on a hand shape or following its movements and the figurations emerging from it; zooming out to understand a gestural diagram or a given performance act in its entirety; as well as shifting focus from the visible communicating body to entities and spaces it is interacting with, combining different perspectives and modes of inference (see Coulson [2001] on semantic leaps).

Empirical results from gesture production studies have shown that people exploit more readily external metonymy (i.e. pantomimed action with the virtual object in hand) than internal metonymy (i.e. body-part-as-object). One reason might be that they imply different modes of abstraction and that abstracting features from an object involves more of a cognitive effort than pretending to hold an object in the hand and performing the essential features of the corresponding prototypical action (see Grandhi, Joue, and Mittelberg [2011] for a user-study and Lausberg et al. [2003] for neuroscientific insights).

It should be stressed that the different iconic and indexical modes presented above are obviously not exhaustive. They need to be tested and modified in light of the specific kind of data and research questions at hand. In each multimodal sign process their varying interaction as well as their correlation with the concurrent speech content needs to be accounted for very carefully. If possible, conventional, habitual, as well as individual gestural practices should also be considered.

5. Concluding remarks: Metonymic "slices of life"

Being existentially tied to the human body and its material and socio-cultural habitat, gestures are, regardless of their predominant function, inherently indexical. Given the body's shifting anchorage in different physical and mental spaces (Sweetser 2012), it is not surprising that quite a range of indices and their interaction with iconic modes could be shown to play a constitutive role in gestural sign creation and interpretation. These

observations attest to the tight link between the communicating body and the mind; they also demonstrate that studying metonymy in gestural abstraction and inferencing allows for new insights into human perception, online conceptualization, and meaning-making processes.

There still is much research to be done on gestures and full-body enactments to better understand how exactly *ad hoc metonymies* (Koch 2004) interact with other central semiotic practices and cognitive principles. It would be worthwhile to establish, for instance, how the distinct metonymic modes discussed in this chapter pattern with particular viewpoint strategies (e.g., Dancygier and Sweetser 2012), gestural modes of representation (Müller 1998), and varying degrees of metaphoricity (Müller and Tag 2012). Another possibility is to explore similar processes in static visuo-spatial modalities such as painting and sculpture. Cubist pictures, for instances, share with gestures that they present what Lodge (1977: 109) called "slice[s] of life": fragments of objects humans interact with on a daily basis such as chairs, cups, bottles, tables, and newspapers (Mittelberg 2006). Human figures, musical instruments, and newspaper headlines typically appear in the form of abstracted forms, e.g., contours, characteristic features (e.g., eyes, guitar strings, truncated words, etc.), or basic geometric shapes (e.g., cubes, squares, triangles, etc.), standing in for the entire gestalts (through internal metonymy). A table can further be suggested by a piece of the tablecloth covering it (via external metonymy). While Cubists were striving to "discover less unstable elements in the objects to be represented, i.e., the constant and essential elements" (Wertenbaker 1967: 86), co-speech gestures have the propensity to pick out or create − so-to-speak on the fly − both globally essential, e.g., prototypical, as well as momentarily salient attributes. Invoking felt qualities of meaning and of understanding (Johnson 2007), gestures are spontaneous communicative actions producing − for conversational partners or audiences − metonymic "slices of life": not only of speakers' outer material living context, but also of their inner life, e.g., their reasoning, imagination, and emotions. In the flow of observing a painting or listening to a person, the interpreter draws on multiple senses in synthesizing the manifold fragments, allusions and perspectives through active "simultaneous vision" (Zeki 1999: 52), and an array of metonymic inferences to a unified whole, that is, an insightful and meaningful semiotic experience.

The following observation by Arnheim succinctly encapsulates the main interest of this chapter; it also inspires us to further investigate, both theoretically and empirically, the intelligent actions of the human body:

> Often a gesture is so striking because it singles out one feature relevant to the discourse. It leaves to the context the task of identifying the referent: the bigness portrayed by the gesture can be that of a huge Christmas parcel received from a wealthy uncle or that of a fish caught last Sunday. The gesture limits itself intelligently to emphasizing what matters. (Arnheim 1969: 117)

Acknowledgements

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133. Ways of viewing metaphor in gesture

1. Introduction: How metaphor has been applied to gesture analysis
2. Metaphor as a semiotic process: Motivating gestures as signs
3. Metaphor as conceptualization: Thinking for speaking and gesturing
4. Metaphor and gesture functions: Referential, discourse related, pragmatic
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Abstract

This chapter outlines different understandings of what metaphor is and how those different accounts have been applied to the study of gesture. In so doing, it shows how the study of gesture has contributed to current research in cognitive linguistics, conceptual and applied metaphor theory, conversation and discourse analysis, cognitive psychology more generally, sign language linguistics as well as embodiment and multimodal communication research. Metaphor has been described as a major cognitive-semiotic process which motivates (to-