Image schemas and mimetic schemas in cognitive linguistics and gesture studies

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Image schemas have been a fundamental construct in cognitive linguistics, providing grounds for psychological, philosophical, as well as linguistic research. Given the focus in cognitive linguistics on embodied experience as a fundamental basis for language structure and meaning, the employment of image schemas in the analysis of gesture with speech is a logical extension. However, given their level of abstraction, to what degree do image schemas provide a useful explanatory tool for researching the concrete, physically embodied details of gestures? This article considers the answer to this question and then turns to a more recent theoretical development that complements the picture by encompassing a different realm of cognitive and linguistic phenomena. This research, on 'mimetic schemas', is shown to have great potential for thinking about some known phenomena of gesture in a new way. Schema research on these different levels thus provides a useful means to analyze behavior in another modality involved in spoken language use, namely the visual.

Keywords: image schema, mimetic schema, gesture, metaphor

1. Introduction

The idea of schemas is certainly not novel with the field of cognitive linguistics. While research on schemas has its origins in various disciplines, the work which was among the most influential in the early years of cognitive linguistics (as noted in Lakoff, 1987) came from cognitive psychology (originating most notably with Rumelhart's [1980] schema theory), computer science (dating back to Minsky's [1975] frames with defaults and Schank and Abelson's [1977] scripts), and, of course, philosophy: Johnson (1987) discusses Kant ([1781] 1968) as the particular inspiration for his idea of 'image schemas', and he notes (Johnson, 2005) the

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predecessor of this notion in the works of James (1890), Dewey ([1925] 1958), and Merleau-Ponty ([1945] 1962).

Within cognitive linguistics, Langacker (1987, p. 132) provides the following definition: "The notion of schematicity pertains to levels of specificity, i.e. the fineness of detail with which something is characterized; … A schema is thus abstract relative to its … elaborations in the sense of providing less information and being compatible with a broader range of options…". He concludes that the fact that we are able to conceptualize situations at different levels of specificity, and express some characterizations of these different levels linguistically, means schematicity has huge implications for how language is structured and used: "The linguistic significance of this ability is hard to overstate" (Langacker, 1987, p. 135).

Various categories of schemas have been proposed in cognitive linguistics within different frameworks of analysis. These include the construct of schema as it is used in cognitive grammar – "an abstract characterization that is fully compatible with all the members of the category it defines" (Langacker, 1987, p. 371) and as discussed in terms of syntactic constructional schemas (Goldberg, 1995; Tomasello, 1992). One of the most influential uses of the term has been in the work on image schemas (Hampe, 2005; Johnson, 1987; Lakoff, 1987). Another proposal, that of mimetic schemas (Zlatev, 2005, and elsewhere), is a more recent addition to the field.

The latter two particular notions will be the focus of this article, as they are two types which have particular significance for research in a different but related field – the study of spontaneous gesture with speech. While scholarship on gesture dates back at least to the time of the Roman orators (Kendon, 2004, Ch. 3), research on it from a linguistic point of view was suppressed in the Anglo-American tradition by the dominance of a modular view of language, promulgated within generative theories of linguistics, which entailed the, since much-lamented, separation in the scholarship of the study of the mind from that of the body. Work on gesture from a more psychological perspective only took hold among (cognitive) linguists in the 1990s and thereafter upon the publication of McNeill (1992) and the development of this work by psycholinguists.

Now we see an enthusiastic *in-corpor-ation* of gesture research into cognitive linguistics, evidenced by its inclusion as a topic in cognitive linguistic conferences and journals. This move, however, raises some interesting questions for concepts that have been developed for cognitive linguistics. How do they apply to a broader notion of language, beyond that found in written and spoken words? The assumption has been that the embodied approach of cognitive linguistics should be readily amenable to co-speech embodied behavior. The research on schemas provides a good case study to ascertain the relevance of, and possible problems

with, constructs from cognitive linguistics as applied to the visuo-motoric modality of gesture. In addition, given the tenet in cognitive linguistics that embodied patterns, such as the ones represented by image schemas, can play an important role in our metaphoric understanding of abstract concepts, some attention will be given to research on image schemas as source domains, an idea which dates back to both Johnson's (1987) and Lakoff's (1987) work, with precursors found in Lakoff and Johnson (1980).

As is clear from the starting point of the paper, we are concerned here mainly with spoken language; signed language, given its nature as a visuo-spatial medium of communication, involves a rather different set of questions in relation to gesture, which go beyond the scope of this article (see, for example, Liddell, 2003). More specifically, the scope of the claims being made here is that of certain Germanic and Romance languages since the published research on the topic of this article has mainly drawn upon examples from English, but some also concerns French, German, Spanish, and Swedish. Given the close relation of these West European Indo-European languages to each other, many questions remain to be explored as to how the concepts discussed below pertain to languages that are typologically different, particularly with regard to their spatial reference systems (see, e.g., Levinson, 2003).

2. Image schemas

2.1 Image schemas in cognitive linguistics

Though having implicit origins in Lakoff & Johnson (1980), as discussed below, the construct of image schemas was explicitly proposed in cognitive linguistics in the same year by Johnson (1987) and Lakoff (1987). It was most notably characterized as follows: "An image schema is a recurring, dynamic pattern of our perceptual interactions and motor programs that gives coherence and structure to our experience" (Johnson, 1987, p. xiv). Some examples include PATH[1] and related notions such as CYCLE; CONTAINER and patterns related to containers and areas, such as FULL-EMPTY and CENTER-PERIPHERY; and force relations such as COMPULSION, ATTRACTION, and ENABLEMENT. Johnson (1987, p. 126) provides a list of some 27, including those listed above, which he counts as among the most important, but it is not meant to be an exhaustive list, and others have been proposed in subsequent research, such as STRAIGHT (Cienki, 1998a) and SELF-MOTION and ANIMATE MOTION for animals and CAUSED MOTION and INANIMATE MOTION for artifacts (Mandler, 1992).

As Oakley (2007, p. 214) sums it up, the basic notion grew as an instrumental part of the epistemology and moral philosophy that Johnson developed as well as part of Lakoff's articulation of a theory of categorization. Lakoff provides two fundamental questions which gave rise to (among other ideas) the theorizing about image schemas: "What kind of preconceptual structure is there to our experience that could give rise to conceptual structure?" and "How can abstract concepts and abstract reason be based on bodily experience?" (Lakoff, 1987, p. 267). Thus the notion of image schemas arose within the establishment of a new philosophical basis for a particular strand of cognitive science, one which led to Lakoff and Johnson's (1999) treatise on "the embodied mind and its challenge to Western thought."

Various attempts have been made to refine or qualify the notion of what image schemas are, or the scope of what they encompass, including accounting for their static and dynamic qualities, and the differing levels at which their schematicity is relevant (Cienki, 1997; Quinn, 1991). One of the most important of these sets of distinctions has been Grady's differentiation between patterns which are claimed to constitute "mental representations of *fundamental units of sensory experience*" (Grady, 2005, p. 44, emphasis in original) and fundamental units which "relate to our interpretations of and responses to the world, our assessments of the physical situations we encounter, their nature and their meaning" (Grady, 2005, p. 47). Grady proposes limiting the former under the term 'image schemas' and acknowledging the different status of the latter under a separate term; he proposes 'response schemas' (Grady, 2005, p. 46). While his category of image schemas includes, for example, CENTER-PERIPHERY, CONTAINER, and BALANCE, others such as CYCLE, SCALE, and PROCESS fall under his response schemas.

Within linguistics, image schemas have proven to be a useful notion in theories of grammar (Langacker, 1987), in psycholinguistic research (Gibbs & Colston, 1995), and most of all in numerous applied linguistic studies, particularly those accounting for the polysemy of individual or related words or constructions and semantic change (see Oakley, 2007, p. 219–223 for an overview). The relevance of image schemas in these linguistic analyses has been taken by many cognitive linguists as supporting evidence for the reality of image schemas in some way on the cognitive and experiential levels, even if the status being claimed for that reality is still acknowledged to be complex and subject to revision (Gibbs, 2005).

In sum we can say that the thinking about image schemas developed primarily from philosophical reasoning within a subgroup of cognitive science oriented toward the analysis of conceptual structure, and its successful uptake in linguistic analyses bolstered (a) the credence in image schemas as a cognitive construct of language users and (b) the attractiveness of image schemas as an explanatory tool which linguists could use, particularly for semantic analyses. Interestingly, despite

the claims about the embodied basis of image schemas, the theorizing about them originated starting in the 1980s without reference to gesture. One major reason could be that gesture studies only gained wide reception in cognitive psychology, and later in cognitive linguistics, after the publication of McNeill's *Hand and Mind* in 1992. However another important factor is the research methodology used: much of the fundamental work on image schemas was based on intuitive analysis of linguistic examples – phrases which were often invented by the authors as plausible, but which were not drawn from corpora of actual usage.

If we consider talk as used in context by hearing, seeing co-participants, the canonical encounter (Clark, 1973) of human communication is face to face interaction. This has led Kendon (1980, 2004) to approach gesture and speech as two aspects of the process of utterance and McNeill (1985, 1992) to claim that gesture and language are one system. Numerous heirs of their research tradition in gesture studies now consider gesture as not nonverbal "body language" but rather as co-verbal behavior. In light of the important role that image schemas have played in cognitive linguistic theory and analysis, to what degree do image schemas provide a useful explanatory tool for researching the concrete, physically embodied details of gestures?

2.2 Image schemas in gesture studies

While there is a solid tradition of experimental work on gesture, especially in the field of cognitive psychology, the bulk of the research on schemas in gesture comes from the tradition of observational (micro)analysis and interpretation. These kinds of studies are fundamental to the field and are needed to lay the groundwork, to ascertain the scope of the phenomena of natural gestural behavior. Perhaps not surprisingly, some of the same image-schematic patterns that Johnson argued as being fundamental to our embodied experience have been observed in spontaneous gestural behavior (Roth & Lawless, 2002). Cienki (2005) found a number of image schemas (CONTAINER, CYCLE, FORCE, OBJECT, PATH) were reliably used to categorize gestures observed from natural conversations. In Ladewig (2011), the CYCLE image schema provides the basis for analyzing a category of gestures among speakers of German (but also other languages) involving a repeated circular movement of the hand, rotating outward at the wrist. Variations were found in the location in which the gesture was performed, corresponding to different functions, e.g., use in the central space in front of the speaker during word searches, but on the side when making requests. The coordinated variations in form and meaning lead to the characterization of CYCLIC gestures as what Kendon (2004) calls a 'gesture family'. Harrison (2009, Ch. 3) also observes the same gesture type

accompanying use of the progressive aspect in English, expressed with *be* + *-ing*, e.g., "*there's something going on in the city that…*", suggesting that it can play a grammatical role and not simply occur with or in place of lexical items. Williams (2008) argues that the PATH image schema – or more precisely, the SOURCE-PATH-GOAL image schematic structure – underlies gestures involving tracing, usually with one's extended finger(s). Tracing of a path can support the speaker's cognition but also, in contexts of demonstrating something or when teaching, it can be used to guide the addressee's conceptualization. Part of the basis of arguing for STRAIGHT as an image schema (Cienki, 1998a) had to do with the distinctive recurring pattern of experience of muscular tension and control involved in effortful, non-curvilinear movement of body parts. While discussed in isolation in the studies mentioned above, image schematic patterns often co-occur in gesture, e.g., movements involving PATH and ITERATION, or PATH, STRAIGHT, and UP-DOWN (Bressem, 2008). This resonates with claims about the co-occurrence of certain image schemas in other aspects of our experience (Cienki 1997).

2.3 Image schemas in metaphor research

The study of schemas in cognitive linguistics has some close ties with research on conceptual metaphors. With regard to image schemas, some might even argue that we can see some circularity in the history of their development as a construct in relation to metaphor studies. Even though image schemas were not named in the 1980 book as such, Oakley (2007, p. 214) notes that "[t]he locus classicus of image schema theory is Lakoff and Johnson's (1980) conceptual theory of metaphor." Generalizing over patterns of metaphors found in language led to conclusions about underlying conceptual metaphors (mappings of TARGET DOMAIN in terms of SOURCE DOMAIN) that provided the structure for the linguistic expressions, and what kinds of source domains that were showing up in the most fundamental types of conceptual metaphors (such as MORE IS UP) provided answers to the questions posed by Lakoff (above). Indeed the convention of using small capital letters to name image schemas follows naturally from many of them having been named in Lakoff and Johnson (1980) as common metaphoric source domains.

The process of deriving image schemas from the analysis of metaphors in language and then justifying those image schemas through later application of them in the analysis of metaphors in linguistic data relies on reasoning that has been critiqued by psychologists as circular (Gibbs & Colston, 1995, p. 354). However, as we see below, the vicious cycle of reasoning – that verbal metaphoric expressions provide evidence for conceptual metaphors and that we know that because we see conceptual metaphors expressed verbally – can be broken by analyzing

metaphor in a type of behavior other than speech itself, such as manual gesture (Cienki, 1998b, p. 190).

As noted earlier, research on image schemas in cognitive linguistics has often been closely connected to metaphor research. In gesture studies, too, we find the link of the schematic imagery in gesture serving as a source domain for various kinds of metaphoric expression. For example, in the gesture involving cyclic rotation of the hand is analyzed in Ladewig (2006, 2011) and Harrison (2009) as connected with various types of processes, either in the content of the speech (ongoing actions) or in the speech situation itself (such as when a speaker is trying to retrieve a word or concept). Here the gesture involves a partial (metonymic) representation embodying something in rotation, such as a gear or wheel, thus actually performing the metaphor of PROCESS AS OBJECT IN ROTATIONAL MOTION. Considering the gesture of a hand tracing a PATH, discussed by Williams (2008), it can physically instantiate the metaphorical linearity of logical thought (Emanatian, 1997) as movement through space, whether or not coordinate verbal expressions of this metaphor (e.g., *do you follow my line of thinking?*) are used. Some gestures moving with short, tense motion in a straight line forward (away from the speaker) have been analyzed (in the proper speech context) as reflecting HONEST BEHAVIOR AS STRAIGHT (Cienki, 1999). But since such gestural metaphoric expressions do not necessarily always occur with metaphorically used words (Cienki, 1998b, 2008), they can sometimes be considered possible evidence of cognitive activation of conceptual metaphors on some level.

2.4 A note on image schemas from a developmental perspective

This research discussed above all concerns behavior of adult speakers. Image schemas have been claimed to play an important role in early development as well (e.g., Gibbs & Colston, 1995; Mandler, 1992, 2005), for example, as patterns which infants may realize and thereby be capable of generalizing across perceptions. Image schemas might therefore be expected to appear in children's early gestural behavior. However, Andrén (2008) argues that at least up to 27 months of age, children "are not doing abstract and refined image schema-like gestures of the kind that can be seen in adults until, possibly, the very end of [that time] period." This suggests that "performing refined schema-like gestures is not simply a question of these abstracted image schematic structures of thought 'spontaneously' coming out of the hands in the form of expression" (Andrén, 2008). Andrén supports the position that less abstract schemas of actions provide a more fruitful option for characterizing young children's gestures, and that later in development, schematic patterns more like those of image schemas become relevant in the structuring of

gestures (and thought). The importance, for children and adults, of patterns on a less schematic level than that of image schemas has led Zlatev and colleagues (see below) to investigate what they call mimetic schemas, patterns which relate more closely to the basic level of categorization (Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976) of actions in human experience than image schemas do.

3. Mimetic schemas

3.1 Background on mimetic schemas

The notion of mimetic schemas had a rather different starting point than that of image schemas. One difference is that it arose from discussion among a team of researchers coming from a variety of interrelated theoretical perspectives: "an interdisciplinary group of linguists, semioticians, cognitive scientists and philosophers" who have taken both "a phylogenetic and ontogenetic perspective" (Zlatev, 2005, p. 315), importantly including developmental research in the scope of their work. In addition, the research has been multimodal in nature from the start, concerning both the audio and visual modalities by considering the interrelationship between language, gestures, and pictures (Zlatev, 2005, p. 315). Finally, it is more recent in origin than the theory of image schemas. It has been developed in Zlatev, Persson, & Gärdenfors (2005a, 2005b) and Zlatev (2005, 2007a, 2007b), building on a key concept of bodily mimesis from Donald (1991). Therefore mimetic schemas were developed with image schemas as background knowledge, in fact in comparison and contrast with them (Zlatev, 2005, §3).

Let us consider the specifics of mimetic schemas. Some examples that Zlatev (2005, p. 317) proposes are EAT, SIT, KISS, HIT, PUT IN, TAKE OUT, RUN, CRAWL, FLY, and FALL.[2] The difference from image schemas is clear, in that while the following properties are possible descriptors of image schemas, they are definitional characteristics of mimetic schemas. Zlatev (2005, p. 318) characterizes mimetic schemas as bodily, representational (not just abstract patterns), dynamic, accessible to consciousness, specific (relating to bodily acts), and pre-reflectively shared (since they derive from culturally salient actions). As opposed to the potentially static nature of some image schemas (Cienki, 1997), mimetic schemas are all about actions, and thus dynamic. In this way, they concern a different level of specificity than image schemas. Thus, while each applies to a narrower range of phenomena, it also is more information-rich (to return to the quote from Langacker, 1987, with which we began). In this regard, they are argued to provide a strong basis for language development in children. Zlatev (2005, pp. 327–328) notes their the close correspondence of the claimed mimetic schemas to the first verbs that

Tomasello (1992) observed from an English-speaking child between the ages of 16 to 24 months, such as *hammer, kick, jump, swim, get-out*. Note, however, that detailed research has yet to be carried out on the metaphoric use of verbs expressing mimetic schemas, although there is interesting potential for this topic, given that the greater specificity of mimetic schematic structures raises questions about the ways and contexts in which they might be extended metaphorically.

3.2 Mimetic schemas in gesture

While the notion of mimetic schemas is still new and has not yet been explicitly employed in gesture studies as a construct, some existing studies implicitly support further exploration of it. Of particular interest here is work which concerns gestures involving schematized versions of manual actions. Calbris' (2003) study, for example, concerns a family of gestures involving a flat hand making a tense, straight movement either down or horizontally across. The horizontal variants, with the palm facing down, are often used by speakers of French, as Calbris observes, but also in many other European cultures, when refusing or negating something. One can see the possible origins in action via the kind of sweeping motion made when removing small unwanted objects (such as dust particles or water droplets) from a flat surface by wiping it. We can see how a mimetic representation of this could be used in other contexts in which no physical object was present that required sweeping. In this sense, the unwanted or refused idea is metaphorically wiped away.

This kind of gesture is what is described by Müller (1998a, 1998b) as the mode of representation in which the hand imitates or enacts an action it would actually do, such as when one depicts writing with a pen by moving one's empty hand horizontally in the air with the hand shape gripped as if holding a pen. Similarly, Streeck (2009) describes handling and mimesis (depicting action) as two forms by which gestures can depict. These kinds of gestures appear to represent mimetic schemas through motor patterns that are informationally rich. In some contexts, enactment gestures are performed with a different kind of function than a referential depiction of some action of the hand. Teßendorf and Ladewig (2008), for instance, discuss the brushing away gesture used by Spanish speakers (but again, also observed elsewhere) in which the slightly curled fingers of one hand quickly flick outward, often done two or three times; the same gestural form to brush something small and unwanted (such as crumbs or lint) off of one's clothes is also sometimes used in the air, not against any surface. In these cases, it can play the role of indicating dismissiveness towards an idea that has been mentioned. In this sense, the schematic action takes on a pragmatic function. In this regard it is

interesting to compare Traugott's (1988) discussion of lexical semantic change in some cases, extending the use of an expression from physical contexts to what is more abstract, subjective, and related to the discourse context. Apparently in gesture as in verbal language, semantic 'weakening' may go hand in hand with what Traugott calls pragmatic strengthening.

4. Discussion

We see from this overview how aspects of the current state of play in both schema research and gesture research manifest themselves more saliently as they are brought into contact with each other. Image schemas and mimetic schemas have been argued to perform different kinds of functions in cognitive terms for language users, and have proven to be useful analytically for the researcher as tools for linguistic analysis on different levels. Similarly, for gesture research, the two notions provide different tools for analyzing, and different levels of explanation for, gesture forms and functions.

For example, we saw above that while both types of schemas provide patterns which can be used in gestures as source domains of metaphors, the target domains of the metaphors involved appear to be different in the two cases. Metaphorically used gestures based on image schemas seem to relate to ideas on the general level of types of processes, reasoning, or behavior, while those based on mimetic schemas, at least in the examples considered above, concerned more particular ideas, like negation or dismissiveness. This could have to do with different types of schematicity involved in the gestures expressing the source domains: with simple motions with less specific handshapes being characteristic of the image-schematic type of gestures (such as PATH and CYCLE), and with handshapes more specifically associated with basic level actions in the case of mimetic-schematic type gestures (such as WIPE and BRUSH AWAY). The greater schematicity of the gestures realizing image schemas may allow for a wider variety of possible metaphoric extensions, while the information richness of the mimetic schemas in gestures may constrain their scope for metaphoric extension. However, confirmation of this hypothesis will have to await further research on image schematic and mimetic schematic structures in gestures as source domains for metaphors.

One question that arises from the discussion above is: at what cognitive level are these schemas operating? Lakoff and Johnson (1999) place image schemas on the level of the "cognitive unconscious," though, Zlatev (2005, p. 322) observes, Johnson (2005, p. 22) qualifies this by saying that the level at which image schemas have meaning for us "*typically* operates beneath the level of our conscious awareness" (emphasis added). Mimetic schemas, however, with their greater level

of experiential specificity, are claimed to be accessible to consciousness, even if not normally in focal consciousness (Zlatev, 2005, p. 318). In relation to gesture, much spontaneous gesturing during talk (what Kendon, 1980, calls 'gesticulation') is done without the speaker being aware of it. In light of this, we can postulate that the image schemas that may structure many gestures are normally playing this role below the speaker's level of consciousness. Indications of the inadvertentness of gesture use can be seen in their production in a low space by the abdomen and with relaxed hands, and from some co-gestural behaviors, such as the lack of eye gaze at them. (Contrast Müller, 2008, on the opposite types of behaviors – such as use of a high gesture space, tension in the hands, and eye gaze at the gestures – which are argued to provide cues of gestural awareness). However the gestures discussed above pertaining to mimetic schemas, especially those involving enaction of a specific behavior, do appear more carefully articulated, more effortful, and more closely involved in detailed, intentionally communicative depiction of the content of the talk. These provide some cues that mimetic schemas may more readily be invoked on a more conscious level.

This gestures discussed in this article involve types which have been observed across different contexts of use, but of course not all gestures can be seen like these as having a basis in image schemas or mimetic schemas. Some contexts call for more idiosyncratic use of gestural forms. Mittelberg (2010), for example, discusses how this plays out in lectures by linguistics professors, in which the notions of syntactic constituents are not only drawn in triangular diagrams on the board in the classroom but are also embodied in the ways in which the professors hold their arms and hands to demonstrate the analyses they are talking about. It is therefore worth bearing in mind that the process of iconic representation of specific physical objects, images, or actions (especially of inanimate objects) lends itself to geometric representation in diagrammatic fashion, rather than in terms of image schemas or schemas mimetic of bodily actions.

A closing point is that this line of research also brings some challenges. One is the current lack of an appropriate meta-language or heuristic tool for describing semantics in this dynamic, multi-modal way (Cienki, 2012) (though see Fricke [2008] 2012, for one proposal). Another is that much of the research on image schemas that has made claims about linguistic semantics has been based on written (sometimes constructed) examples. An approach to semantics which can handle gesture as part of the act of utterance (Kendon, 1980) needs not only to draw upon spoken language data, but also to be based on appropriate units of analysis for spoken language, such as intonation units (Chafe, 1994), rather than the traditional level in linguistics, that of the sentence. We see that the written-language bias found in mainstream linguistics (Linell, 2005) persists even in much of cognitive linguistic theorizing.

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Notes

1. I will follow the convention in the literature of using small capital letters to indicate names of image schemas.

2. The convention of also identifying mimetic schemas with small capital letters that Zlatev uses will be followed here.

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