Gesture & Thought. David McNeill, Chicago: Chicago University Press, 2005, 340 pages, $38.00 (hardback). ISBN: 0-226-51462-5.

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David McNeill is one of the founding fathers of modern gesture studies. He has significantly contributed to the establishment of co-speech gesture as a recognized field of research within his own disciplines, psychology and linguistics, and also in neighboring fields such as anthropology, sign language studies, and cognitive science. For more than two decades, McNeill's achievements (e.g., 1992, 2000a, b), and those of his colleagues at the University of Chicago (e.g., Goldin-Meadow, 2003; McNeill & Duncan, 2000; McNeill et al., 2001), have shaped gesture research in terms of both theoretical advancements and methods of gesture coding and transcription.

McNeill's new book is a companion to his earlier, ground-breaking monograph *Hand and mind: What gestures reveal about thought* (1992), in which he presented a unified account of how spontaneous co-speech gestures may provide a window on the intricacies of on-line thought processes, bimodal utterance production, and discourse strategies. Demonstrating how hands tend to reveal information the concurrent speech might conceal, McNeill's (1992) work has served as an eye-opener for scholars interested in actual language use and its cognitive and sociocultural foundations. In the meantime, gesture research has found its place within cognitive-functionalist linguistics, offering multimodal insights into embodied spatial concepts, image schemas, and conceptual metaphor, and also had a considerable presence at recent linguistics conferences (e.g., at ICLC 2003, EMCL 2003, and IPrA 2005*;* see Cienki & Müller, forthcoming, and Gonzalez-Marquez et al., 2007).

Such cross-fertilization has resulted in the enrichment of all strands involved, and there is hardly any study on gestural phenomena, whether more cognitively or culturally oriented, that would not draw in one way or another on McNeill's work. The book under review here presents the reader with the fruits of a career-long study of the *thought-language-hand link* (p. 233), culminating in intersecting models of language use, development, evolution, and the brain. Below, I first present the main tenets of McNeill's new theory of gesture and thought, and then address issues of gesture categorization, iconicity, and metaphor.

Some of McNeill's principal concerns have been to determine how exactly the collaboration of linguistic and gestural expression of an idea might work, how gestures may affect thought, how linguistic relativity is reflected in different patterns of gesture-speech synchrony, and how this tight interaction might break down or

adjust in the event of brain injuries. McNeill's theory is based on the Vygotsky-inspired claim that "gesture and speech arise from a single process of utterance formation" (McNeill, 1992, p. 29; Vygotsky, 1986). According to this model, gesture imagery (described as global, synthetic, and nonconventionalized) and speech (described as linear, segmented, combinatorial, and conventionalized) dialectically represent different aspects of thought, which appears to be inherently multidimensional, i.e., both imagistic and verbal (McNeill, 2005, pp. 6–12). Furthermore, both channels shape the process of utterance formation in terms of contributing meaning and structure, setting rhythmic pulses, devising discourse segments, as well as expressing contextual relevance and other sociocultural factors. McNeill shows that speech and gesture are for the most part not redundant, but assume complementary semantic and pragmatic functions while carrying out a single plan of action (p. 86). Among the distinct types of meaningful movements speakers perform with their hands, arms, heads, and torso, the major part of McNeill's investigations and theory-building has concerned naturalistic co-speech gestures which are located at one end of what McNeill (1992) termed "Kendon's continuum." This includes *gesticulation—pantomime—emblems—sign language*, with gesticulation being the least conventionalized system of hand movements and sign language the most conventionalized system (see also Kendon, 2004).

McNeill's central argument regarding *why* spontaneously occurring gestures should be viewed as active participants in *thinking for speaking* (Slobin, 1996) and, as such, be incorporated into linguistic analysis, is reminiscent of the verve with which Lakoff and Johnson (1980) first put forward the ubiquity of conceptual metaphor:

> gestures are regarded as parts of language itself—not as embellishments or elaborations, but as integral parts of the process of language and its use. The development of this line offers new insights into the nature of thinking, remembering, and interacting with words in a social context. This book takes the point of view that language and gesture are integral parts of a whole and regards this multimodal unit as language itself (McNeill, 2005, p. 13).

One of the pillars of McNeill's augmented theory is a dialectic between the *dynamic* dimension of language (inspired by Vygotsky, 1986) and its *static* dimension (e.g., Saussure, 1959). Offering a novel reading of Saussure, McNeill argues that the *static* side (experienced by the speaker in the form of well-formedness intuitions) and the *dynamic* side (i.e., continuous shaping of discourse and context according to thought processes and socially geared action) interact in any communicative act (Chapter 3). While other scholars, such as Jakobson (1971), also claimed that the static and dynamic aspects of language, e.g., *langue* and *parole* (Saussure) or *code* and *message* (Jakobson)*,* are dialectically interrelated, applying these considerations to both gesture and speech offers new perspectives and in-

sights. Moreover, meaning-making is seen as a distributed process to which both speaker and listener contribute in a dialogic fashion. This understanding is also reflected in McNeill's response to a long-standing controversy as to whether it is the speaker or the addressee that benefits more from gestures (p. 53). In his view, gestures, always produced in a social-interactive context, are important for both parties. In strictly Vygotskyan terms, "every thought (intrapsychic) passes through a social filter (interpsychic)" (p. 54). McNeill's assertion that contemporary linguistics has remained more or less locked into the static tradition might come as a surprise not only to cognitive-functionalist linguists. While he considers a few approaches to language that do represent a dynamic view, such as emergent grammar (Hopper, 1998) and Müller's (2004) triadic model of metaphor in use (pp. 80ff.), there surely is a host of other work that could support and complement his theory in terms of both the processual and social/distributed nature of meaning-making. This is particularly true for lines of research that incorporate gesture and gaze into linguistic analysis: for instance, grammar and interaction, conversation analysis, ethnography, and discourse pragmatics (see contributions in Tomasello, 1998, 2003).

Introducing the concept of a dynamic *language-imagery dialectic*, McNeill (2005, p. 4) places the emphasis on the insight that "language is inseparable from imagery" (Chapter 4). On the basis of videotaped narratives (retellings from memory of the animated cartoon "The Canary Row") delivered in various languages and by children, healthy adults, as well as by aphasics and split-brain patients, he demonstrates how gestures may fuel and actually shape thought and speech in a real-time dialectic consisting of two contrasting yet simultaneously engaged modes of cognition. In concert, linguistic categorial content (materialized in speech) and imagery (embodied in gestures) achieve a finely orchestrated co-expression of verbal and visuo-spatial thought. For example, in a scene that builds the basis for many of the audio-video segments discussed in the book, Tweety Bird first goes up via the inside of a drainpipe and then gets a bowling ball and drops it down the same pipe to keep Sylvester from following him (pp. 113ff.). One speaker, while saying "and drops it down" makes a downward thrusting gesture, executed with two hands palms loosely cupped and facing downward, with its stroke (i.e., peak) on the mention of "it down" (and not on the mention of "drops"). Here, gesture and speech, McNeill maintains, jointly convey the concept of an antagonistic force: the verb was irrelevant to the focus of the presentation, organized around the image, and was as such excluded from the gesture that carried the main concept (p. 115).

The book is carefully choreographed such that its theoretical core, the model of the *growth point* (GP), takes center stage in the text as a whole and also in each of the interlocking models mentioned above (of language use, development, evolution, and the brain). Representing the minimal analytical unit of the gesture-speech dialectic, the GP was already introduced in previous publications

(McNeill, 1992, McNeill & Duncan, 2000), though an impressive body of evidence stemming from a diverse subject pool is systematically presented for the first time here (Chapters 4–8). The GP is understood as the initial impulse of a unitary thought, out of which an organizing process emerges during real-time utterance generation (p. 106). It is said to encapsulate the content that is newsworthy in the immediate context, context here being understood as the background from which a psychological predicate (Vygotsky, 1986) is differentiated. Born out of a state of instability caused by the interaction of the two opposite semiotic modes, a GP is shaped by contextual forces so as to highlight what is novel in a field of contrasts. Importantly, this minimal unit is assumed to contain both imagistic components and linguistic categorial content, motivating the form of a gesture which tends to embody those elements that contain locally significant information (p. 108). In the example discussed above ("[he] gets a bowling ball and drops it down the drainpipe"), the GP consists of the image of the downward movement, combined with the linguistic content of the "it" (i.e., the bowling ball) and the path particle "down" (p. 114). What is particularly interesting here is that gestures ground linguistic categories in an instantaneous visuo-spatial context. Herein, linguistic categorization, i.e., the static dimension of language, plays a central role in bringing "the image into the system of categories of the language, which is both a system of classification and a way of patterning action" (p. 116). McNeill and Duncan termed this bimodal articulatory process, during which additional meanings are generated, the *unpacking* of the GP: "The surface utterance works out the implications for the GP and finds a grammatical framework in which to fit it. Thought undergoes continuous change during this process, thus shaping thinking *while* speaking" (McNeill & Duncan, 2000: 146, emphasis added; see also McNeill, 2005, pp. 122ff.).

The sections entitled "extensions of GP" (pp. 128ff.) offer deeper insights into the "how" and "why" of gesture-speech co-expression: e.g., regarding the predictability of both the nature of GPs and where they are likely to occur in the cartoon retelling narratives; how interlocutors may jointly produce the different components of a single GP; and what gesture-speech asynchronies or mismatches may tell us about possible cognitive and communicative underpinnings. What emerges as particularly valuable are the connections McNeill draws between the affective-volitional tendencies of a speaker (e.g., irony, humor, anger, etc.) and what she might wish to highlight in a given moment. The speaker's motivations, emotions, and memory may induce different kinds of oppositions being set up in the self-created context from which GPs are formed (pp. 148ff.).

Besides the growth point, McNeill and collaborators identified the *catchment* as a more expansive unit of analysis, pertaining to discourse themes (Chapter 5): "two or more gesture features recur in at least two (not necessarily consecutive) gestures with partially or fully recurring features of handedness, shape, movement, space, orientation, dynamics, etc." (p. 117). The catchment conveys "a kind of thread of

visuo-spatial imagery that runs through a discourse to reveal the larger discourse units that emerge out of otherwise separate parts" (ibid). McNeill further demonstrates ways in which catchments may provide a gesture-based window into discourse cohesion at both the content and narrative levels.

Given this noted pervasiveness of gesture, the reader might wonder what happens in its absence. The idea that motion, prosody, and discourse structure are integrated at any moment of speaking (p. 164ff.) might suggest that these components unceasingly work together. Nonetheless, long stretches of conversations, narratives, or lectures may occur without hardly any accompanying gesticulation, and yet the discourse may still be cohesively structured, delivered, and meaningfully received by the addressee(s). To illuminate these issues, McNeill deploys the concept of *material carriers* (Vygotsky, 1986), defined as the "embodiment of meaning in a concrete enactment of material experience" (pp. 98ff.). Drawing on Merleau-Ponty (1962), he interprets performing a gesture as bringing an idea into material existence, i.e., the speaker's own existence, or "cognitive being" at the very moment. A fully executed gesture is the image of an idea in its fullest embodied form; the absence of a gesture is the image in its least material form. The latter scenario is to be expected in the case of fading memory or complete predictability of what comes next (p. 103). In essence, "the greater the felt departure of the thought from the immediate context, the more likely is its materialization in a gesture, because of this contribution to being. Thus, gestures are more or less elaborated depending on the importance of material realization to the existence of the thought" (p. 99). This could explain why speakers tend to rely on gesture when talking about things that are absent from the immediate physical context, unfamiliar to the addressee, and/or pertain to abstract knowledge domains.

Being a visuo-spatial, actional medium, gesture appears to naturally lend itself to dynamically represent object movement through space and to provide glimpses at visuo-spatial cognition. McNeill argues that the linguistic relativity hypothesis (Whorf, 1956) applies to both the static and dynamic dimensions of language (Chapter 6). For McNeill, linguistic determinism is not only a matter of habitual thought and of how *thinking for speaking* is conditioned by the morphosyntactic encoding mechanisms of a given language (Slobin, 1996); rather, languages reveal their own patterns of visuospatial thinking during speech (pp. 195ff.). In other words, gestures, in particular GPs, may differ from language to language, even in predictable ways. Indeed, McNeill found that while speakers of typologically different languages may share comparable mental imagery of a given motion event (portrayed in the cartoon story), they package its components differently in terms of manner and path (Talmy, 1985). Converging evidence comes from cross-linguistic studies of satellite-framed languages (e.g., English, German, and Mandarin) versus verb-framed languages (e.g., Spanish, Turkish, and Japanese). Results show that when describing how Sylvester rolls down an inclined street with the bowling ball inside of him, English speakers tend to convey manner via the

verb and path via gesture (synchronized with the satellite preposition "down," for example), whereas Spanish speakers tend to convey manner in gesture even if it is not encoded in the speech (Spanish motion verbs tend to not encode manner lexically and need an adverb or gerund to express it; see also McNeill, 2000; Müller, 1998; and Lantolf & Thorne, 2006).

Tracing the development of a language-gesture system in children, McNeill suggests that the imagery-language dialectic undergoes a developmental process of its own (pp. 180ff.). Its onset seems to take place between ages 3 and 4, when two signature changes occur: a gesture explosion, i.e., a sudden increase in the amount of gestures produced, followed by a decomposition effect, in an attempt to shape gestures for meaningful co-expression with language. McNeill sees the source for these cognitive steps in the child's upcoming awareness of the self as an agent, which also triggers the capacity to distinguish between observer viewpoint and character viewpoint.

McNeill's brain model is based on the assumption that language and gesture centers overlap considerably (Chapter 7). Broca's area in particular is, according to McNeill, "the unique point of (a) convergence and (b) orchestration of manual and vocal actions guided by GPs and semantically framed language forms" (p. 232). Drawing on data from both aphasic and split-brain patients, he argues that Broca's aphasia may result in agrammatic speech but that GPs and catchments (assumed to come from outside Broca) remain intact, to the effect that the repeated catchment imagery provides context and thereby may aid the speaker in completing a coherent statement (p. 216). By contrast, GPs get deformed in the case of Wernicke's aphasia, which causes the speech to be semantically and pragmatically empty: here inadequate categorical content parallels a lack of coherence in gestural imagery (cf. "anti-catchments," p. 219). McNeill further suggests that the dynamic dimension of language (e.g., imagery, context, and relevance) heavily depends on the right hemisphere, which is important for the creation of GPs and catchments (p. 221). Accordingly, right hemisphere damage targets gesture imagery, contextual grounding, and speech-gesture synchronization. As a result, gestures get depleted and disturbed, and GPs are poorly situated. These observations are supported by data from split-brain patients, one of which exhibited a trade-off between speaking and gesture imagery: when performing an elaborate iconic gesture, speech ceased completely. McNeill explains this with a *coup d'état* by the isolated right hemisphere, keeping the speech-specialized left hemisphere from cooperating (p. 229).

McNeill's theory of language evolution (Chapter 8) proposes that without gesture language could not have evolved and that evolution selected the capacity of language-gesture co-expression. Broca's area is supposed to be the locus where hand movements have come to be orchestrated under some significance other than the actions themselves. Importantly, data show that gesture, i.e., the *thought-language-hand link,* can be dissociated from instrumental action (p. 234). This step presupposed a social anchorage of gesture and speech (cf. "Mead's loop", pp.

250ff.). A special role in this is attributed to the mirror neurons, located in Broca areas 44 and 45, which get activated when a person observes grasping movements produced by someone else (Rizzolatti and Arbib, 1998) and also allow speakers to perceive their own gestures as a social stimulus. This takes the reader back to McNeill's constitutive claim that language is inseparable from imagery and that the static dimension is separable from the dynamic dimension, all of which are rooted in socially grounded processes of making meaning.

   Besides these substantial models, there are a few other aspects that deserve attention. For example, the question of how to classify co-speech gestures in terms of their meanings and pragmatic functions has occupied gesture researchers for some time. For readers who have worked with the gesture categories introduced in McNeill and Levy (1982) and McNeill (1992), it might come as a surprise, or perhaps as a relief, to see that the new approach contains a major shift away from the original and widely applied categories *beats*, *iconics*, *metaphorics*, and *deictics* (inspired by the semiotic categories of C. S. Peirce, 1960). McNeill now proposes instead to speak of "dimensions" of gestures (e.g., *iconicity*, *metaphoricity*, *deixis*, *social interactivity*, etc.), thus allowing the researcher to better account for the fact that gestures are multifaceted and that several dimensions may mix in one and the same gesture (pp. 38–43). For instance, a deictic gesture pointing at a location in gesture space at the mention of an abstract idea may be metaphorical at the same time. The dimensional approach has clear advantages and does in crucial ways reflect Peirce's view of the sign as a dynamic process in which the different referential relationships layer to various degrees (i.e., there are in principle no pure icons, indices, or symbols). Still, one might ask why McNeill disfavors a hierarchical ordering of the different dimensions, since it contrasts with Peirce's understanding that in any sign-object relationship one of the interacting modes is most prominent (Jakobson, 1971; Peirce, 1960; see also Mittelberg, forthcoming). In light of McNeill's assertion that a "semiotic relation appears when an observer is taken into account" (p. 100), it is unclear why "iconicity is unable to explain how a gesture represents something to a third party" (ibid.). McNeill suggests that, for the speaker-gesturer, a gesture is not an act of representation; rather, "it is created by the speaker as a materialization of meaning" (p. 58), where the meaning *inhabits* the gesture (p.100, cf. Merleau-Ponty, 1962). Pursuing the Peircean path further would entail the possibility to integrate more fully the perspective of the listener-observer (i.e., the addressee in a conversation or the gesture analyst), and it would also support McNeill's claim that an important step in language-gesture evolution consisted in the speakers' (self-)realization that their own gestures had a socially imputed meaning. Viewed from this angle, one could say that the individual was interpreting, in the Peircean sense of the word, his/her own gestures from an observer's perspective, thus instilling them with meanings other than the ones that can be assumed to immanently inhabit them (see Deacon on Peirce (1997, pp. 69ff.) and Merleau-Ponty (1962, p. 215) on the spectator's act of recapturing the sense of a gesture).

Naturally grounded in the concreteness of the human body, "gesture appears to be the essence of embodiment" (p. 102), and may also provide material carriers for emotions and abstract thought. While gestures may generally depict the spatial structure of a given scenario (p. 149), this kind of visual mnemonic, able to support both memory and imagination, seems to be particularly valuable regarding concepts that rely on a metaphorical detour to find expression. An example would be to refer to an abstract idea by seemingly presenting a physical object in one's open cupped hand (i.e., an instance of the conduit metaphor, cf. p. 39). Regarding metaphoric gestures, McNeill now stresses the importance of convention. Convention here is to be understood as the principle causing a person to make, for instance, an open hand gesture when referring to an abstract idea. Furthermore, McNeill states that such metaphoric imagery is culture-specific: "images and their metaphoric extensions embody some of the most deeply entrenched ontological beliefs in a given culture" (p. 46). His attempts to account for both cognitive and cultural motivations of gestures reflects what seems to be one of the major and most intriguing challenges in interdisciplinary gesture research. Here, the growing body of work on metaphoricity in gesture, done from a cognitive linguistics perspective, may shed additional light on cognitive and expressive habits (or conventions). Although it remains to be seen which of the tendencies observed so far hold across languages, contexts, and cultures, converging evidence suggests that image schemas and conceptual metaphor and metonymy may motivate, at least partly, spontaneous gestural representations of abstracta (e.g., Calbris, 2003; Cienki, 1998, 2005; Cienki & Müller, forthcoming; Mittelberg, 2006, forthcoming; Müller, 1998, 2004; Sweetser, 1998). While these aspects might be of central interest to cognitive linguists, they only represent one area within the all-encompassing work McNeill presents in this insightful and paradigm-changing book which will leave a lasting imprint on a broad spectrum of disciplines and minds.

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