Distributed Language

Abstract
In viewing language as multi-scale co-ordination, the distributed perspective challenges two dominant orthodoxies. First, it denies that language is essentially 'symbolic' and, second, that verbal patterns are represented inside minds (or brains). Rather, language is, at once, collective, individual and constitutive of the feeling of thinking. It is distributed between us. In illustration, the opening Chapters report empirical work on the anticipatory dynamics of reading, its cognitive consequences, Shakespearean theatre, what images evoke and solving insight problems. Having given reason to consider this challenge to linguistic autonomy, the collection concludes with theoretical papers. First, it is argued that language depends on a species specific form of semiotic cognition. Second, it is suggested that realizing values is a central function of language. Third, as with all social activity, this is traced to how cultural and biological symbols co-regulate human dynamics. Finally, Steffensen (this volume) argues, far from being organism-centred, language gives us access to an extended ecology in which, through co-ordination, we enact our own history.

1. Beyond symbol processing

Computational views of mind invoke a system that functions syntactically and, for that reason, without reference to human life. Today, however the study of cognition is moving away from such models. Living human beings rely on, not just symbols, but also interactions that sensitise us to each other and our cultural practices. This commonplace idea took on new life when Hutchins (1995a, 1995b) used cognitive models to examine how we navigate ships and land planes. He showed that culturally-specific artefacts and narratives serve in propagating representations in a public domain. Cognition is cultural and embodied: while much happens in the brain, events arise as people interact both with each other and the world. While the view is now mainstream in cognitive science, *Distributed Language* shows its radical implications for language. Since humans do not need artefacts to embody thoughts, language is fundamentally dynamic. Verbal patterns constrain bodily movements and the feeling of thinking as people co-ordinate the flow of activity. The perspective thus challenges theories that privilege linguistic form and/or function. Co-ordination becomes a means of embodying thoughts: language is, at once, ecological, dialogical and non-local.

2. The distributed perspective

Language can be traced to how living bodies co-ordinate with the world. On this perspective, far from being a synchronic 'system', language is a mode of organization that functions by linking people with each other, external resources and cultural traditions. We concert speech, thinking, gesture and action in species-specific ways. Language arises as we give voice to wordings, make gestures, imagine and deal with objects and institutions. It is whole- bodied activity that shapes sense-making and, once skills develop, allows texts and institutions to enrich what we think and do. Rather than view language as an *object*, we live in a social *meshwork* (Steffensen, Thibault and Cowley, 2010; Thibault, in press) whose dynamics fuse events that draw on many time-scales. Linguistic experience alters who we become as we orient to others (who orient to us). Just as I co-ordinate with my imagined reader, you draw on your expectations, scan what is before your eyes, evoke memories and, perhaps, see future prospects. Even in reading, language-

activity connects eye and head movements with inscriptions and wordings. For those concerned with the results, we can ask what happens as we create and construe language and, generally, manage human action. Language links the here-and-now with what has been and, crucially, what is to come. It is thus beyond dispute that, in this sense, language is a distributed phenomenon.

Though languages and their parts constrain sense-making, humans also rely on intertwining gestures, voices and artifacts. When the language sciences focus on these multi-scale dynamics, they discover an alternative to positing a priori *linguistic signifiers* (or language-systems). Before turning to dynamics, I briefly sketch difficulties that arise from putting symbols (or words) first. Above all, these are abstractions that unzip language from embodied activity. They conflate acts of utterance (movements) with descriptions of results (as verbal patterns). Not only does this mask the interdependency of voices, gestures and artifacts, but languages become disembodied 'systems'. They come to be reified in terms of letter-like constituents, larger units and linguistic forms. While of value to characterise meanings, words and grammars, appeal to abstractions cannot clarify human behaviour. Quite simply, what we do and say –how we embody thoughts –is cultural activity. Symbol-first or disembodied approaches overlook activity and, in its place, offer explanations about the organism (or its parts). Instead of tracing skills to experience, these are ascribed to the functioning or minds, brains, discourse or, perhaps, knowledge of social conventions. Appeal to language-systems excludes real-time dynamics by invoking brains or minds that make, construe and manage utterance-types said to be generated or produced by a single organism. For Saussure, regularities are 'imposed rather than freely chosen'; forms and/or functions draw on an inheritance that we have 'no choice but to accept' (Saussure, 1983: 71). On a disembodied view, linguistic signs are given in advance and human languaging reduces to how 'systems' manipulate verbal patterns. In the distributed language movement, by contrast, we reject symbol-first views of language.

3. The Distributed Language Movement: Prehistory

Language can be traced to multi-scalar dynamics that spread across groups, artifacts and time-scales. The perspective emerged from linking integrational critique of linguistics (Harris, 1981; Spurrett, 2004), with distributed cognition (see, Hutchins, 1995a; Hollan, Hutchins and Kirsh, 2000; Giere, 2004). The move made clear that challenges to code views of language parallel those mounted on the symbolic view of mind (see, Love, 2004; Kravchenko, 2007; Cowley, 2007a). Like human cognition, language is embodied, embedded and intrinsic to a cultural world. In Love's (2004) terms, *first-order* activity (e.g. speaking and hearing) can be perceived, described and interpreted as verbal patterns or *second-order* cultural constructs. On this view, learning to talk depends on human bodies that enact intersubjective behaviour (Trevarthen, 1979). Contextualizing bodies prompt us to vocalize, engage with others and, eventually, act in line with constraints that are perceived as verbal patterns (Cowley, 2004). We learn to act and, when it suits us, to frame explicit messages. This, however, depends on a a form of control based on hearing utterances as examplars of verbal patterns. By coming to do this or *taking a language stance* (Cowley, in press), we develop skills based on careful use of wordings. This contrasts with spontaneous language that arises as we engage with people, things and

even our own thoughts. At all times, however, *digital signalling* (Ross, 2004) is co-ordinated with bodily expression and prosody. In the resulting utterance-activity, vocal and non-verbal expression are integrated by bodies that adjust to events in a cultural world. As Ross (2007) argues, following Dennett (1991), we narrate selves into being. Biological agents reorganize as *persons* who integrate events (of various kinds) with structures based on ontogenesis, learning, history, and human phenotypes. To pursue reciprocal links between language and humanity, a group of scholars set the goal of transforming the language sciences. We founded the *Distributed Language Group* (DLG) whose first meeting at Sidney Sussex College gave rise to papers (see, Cowley, 2007b) that inform the current focus on dynamics. However, before turning to their multi-scalar complexity, I sketch how language is ecological, dialogical and non-local.

4. Language: ecological, dialogical and non-local

Whereas disembodied views place language in either the mind or in society, the distributed perspective treats language as part of the ecology. It arises as social events link bodies with the physical environment and cultural traditions. Language is therefore neither localized within a person (or a body) nor a property of the environment. This ecological perspective challenges all organism-centred models. It asserts that, "in any functional sense organism and environment are inseparable and form only one unitary system" (Järvilehto, 1998:329). Rather than separate language from artifacts and actions, a history of bodily co-ordination gives us the necessary skills. As we go about our lives we encounter selves and others whose lives are deeply affected by linguistic resources. Language is *activity in which wordings play a part*. The umbrella definition permits us to connect up concepts that include 'languaging' (Maturana, 1988; Kravchenko, 2006), 'utterance-activity' (Cowley, 1994, 2009b; Thibault, in press), 'first-order language' (Love, 2004), 'dialogue' (Linell, 2009), 'colloquy' (Jennings and Thompson, in press) and 'embodied, embedded language use' (Fowler, 2010).

In denying that individuals produce and process utterance-types, co-ordination is traced to use of ecological resources. As we engage with language, we dream, think, talk and use texts, telephones, computers and so on. In recognising this diversity, the study of language becomes ecological (see, Hodges, 2007; Hodges and Fowler, 2010; Thibault, in press; Cowley, in press). More specifically, emphasis falls on what results from continuous activity by Organism-Environment Systems (see, Jarvilehto, 1998; 2009). On this view, the concepts of *language*, *action* and *perception* can all describe the same events. To read, for example, is to perceive and, necessarily, to actively construe what one sees. In dialogue, as we speak, voice dynamics shape hearing, feeling and thinking. Even writing depends on monitoring the results of movements both in real time and by means of editing. As part of action and, given imagination (and consciousness), language becomes part of silent thought: it is gradually insinuated into perception as reiterated phonetic gestures are connected with both wordings and our modes of life. Utterance-activity arises as we make and track phonetic gestures (Fowler, 2010) that prompt us to hear utterance-types. Using different time-scales, rich linguistic memory evokes experience (Port, 2010) that gives wordings a particular sense. Utterance-types that we report (or transcribe) are also co-ordinated voice dynamics. Dialogical activity is constrained by phonetic gestures that prompt us to hear wordings and, at times, to attend to verbal structures: languaging arises as phonetic gesture is co-ordinated with other

neuromuscular activity. We talk, experience selves, encounter others and enrich *the feeling of thinking* (Harnad, 2006). From an ecological perspective, this is neither internal nor organism-centred: feelings contribute to a common world.

Language is also fundamentally *dialogical*. While its ecological side can be traced through phonetic science, its 'digital' or verbal aspects profoundly influence our sense of self and experience of others. In part, we are how we speak with each other. As Bakhtin (1981) and Mead (1932) saw, experience of sense-making insinuates a self into how we feel, act and think. As this emerges, we discover the criss-crossing or overlapping senses that are evoked by wordings. Semantics is dialogical and rich in connotations: if this seems odd, it is because written language bias (Linell, 2005) masks the *other orientation* (Linell, 2009) of human communication. To speak is to anticipate the response of the other: vocalising and moving drives flexible, adaptive behaviour. Though inseparable from cognition, language unites social action, verbal pattern, meaning and, crucially, real-time understanding. Further, the brain self-organizes as social co-ordination prompts us to individuate. In learning to talk, we speak, monitor the saying, the said and displays of expectations. Contingencies of our lives lead to the flowering of language. To make sense of its complexities, we entwine dialogue with actions and, thus, set off expressions of power and experience of relationships.

This may seem puzzling: how can a focus on organism-environment relations be linked to the wordings and dialogical events of social life? How can language enact expressive control, feeling, thinking, and prompt us to hear people *saying* something? Taking a phenomenological view, Linell (2009) emphasises situations while recognising that expression evokes traditions, voices and ever changing circumstances. Thus, while situated, language exemplifies *double dialogicality* by linking lived events with material and, inseparably, silent or 'third-party' phenomena (2009: 21). Linell echoes Bakhtin's, "the world is a drama in which three characters participate (it is not a duet but a trio)" (1986: xviii). Far from appealing to linguistic signification/meaning or a Peircean triad of sign/object/effect, a world of social norms prompts us to orient to absent others. We integrate activity, what we hear, and bundles of social expectations. This contributes to what Goffman (1959) calls the 'public presentation of self' by means of, for example, use of interactional regularities, genres, register, language varieties. Language is thus grounded in neither bodies nor society but the play of dialogue. The challenge to the distributed movement is that of reconciling our dialogical propensities with, first, our cultural nature and, second, our co-evolutionary history.

The challenge of integrating time-scales demands a *non-local* ontology (Steffensen and Cowley, 2010). By linking phonetics, phenomenology and its products, language becomes measurable activity that, oddly, is perceived around historically-based patterns. Its symbiotic character undermines any simple division between subject (the observer) and object (the observed). We are bound to be sceptical that social events, including linguistic events, can be traced to a localised 'cause' or, in Whitehead's (1926) terms, that they can be explained around the *assumption of simple location.* Indeed, even objects like *stones* exist in a state of change –however slow the change may be. While much could be said, a cautious view highlights biological function. Living systems do not 'occupy' space-time because, among other things, their genetic structures outlast

phenotypes. Even simple human observations and actions link evolutionary, developmental and collective history. Explanations of real-time language cannot ignore non-local "regions of space-time" (Whitehead 1926: 62). Given that linguistic states or processes do not 'occupy' a determinate space-time zone, Steffensen and Cowley (2010) propose a *principle of non-locality*. Cognitive dynamics evoke (non-local) wordings: language is both measurable first-order activity and organization that sustains traditions. It is both dynamical and symbolic or, in short, a *symbiotic* mode of communication. While some trace this duality to our use of virtual structures (Cowley, 2007, Love, 2007), others stress that biological dynamics result from physical constraints (Carr, 2007; Rączaszek-Leonardi and Kelso, 2008).[1] In enacting utterance-activity, they argue, we draw on physical structures (in some to-be-specified sense). While the future of this debate is unknown, the underlying premise is clear. However non-locality is construed, language links people, phonetic activity, wordings and history. Though occurring 'in' time, it is not wholly situated. Activity is 'mediated' by patterns that make language, at once, a phenomenological construct and a biological product of evolutionary change (including natural selection).

5. Investigating the glue of cognition

The DLG views language as ecological, dialogical and non-local. While specifying this perspective is a step towards transforming the language sciences, it is just a beginning. Making a further move, this volume shifts the emphasis from symbols to bodily dynamics. Five derive from a workshop on the *Dynamics of Linguistic Material* where several authors (Cowley, Kravchenko, Fioratou, Tylén, Van Heusden, and Rączaszek-Leonardi) scrutinised the view that material symbols extend the mind (Clark, 1998; 2008). [2] Though differences abound, all concur that dynamics are at least as important as 'symbols' (or slow dynamics) and, in terms offered by David Kirsh, that co-ordination is 'the glue of cognition' (Kirsh, 2006). In scrutinising co-ordination, several papers focus on how historically derived resources affect language-activity. First, Järvilehto and colleagues (this volume) show the crucial role played by *anticipatory* dynamics in reading aloud. Then, turning to the theatre, Tribble (this volume) explores the languaging that occurred in Shakespeare's historical and material context. Next, using ecological psychology, Hodges (this volume) shows how human values realizing draws on linguistic dynamics. Finally, having traced material symbols to grammatical tradition, Steffensen (this volume) suggests that a history of linguistic co-ordination has transformed the human ecology.[3] Verbal patterns allow living bodies to use co-ordination to connect us with each other, artifacts, thoughts and actions. Given that language is multi-scalar, airborne synapses locate utterance-activity in history. Language draws on collective resources that give meaning to individual actions (and lives).

[1] Figures such as Peirce (1940), Gibson (1979), Dennett (1991) and Ross (2000) claim that 'virtual' organization sustains both minded behaviour and language. On the other side, Rączaszek-Leonardi (see, 2008; this volume) offers a view that invokes physical symbols based on the work of Howard Pattee (e.g. 2008).

[2] At the first meeting of the Swedish Association for Language and Cognition in Lund in November, 2008.

[3] Most of the papers are revised versions of Cowley's (2009a) Special Issue of *Pragmatics and Cognition* on *Distributed Language* (Järvilehto, Nurkkala, & Koskela, Kravchenko, Fioratou & Cowley, Tribble, van Heusden, Hodges and Rączaszek-Leonardi). However, those by Cowley, Tylén, Phillipsen, & Weed and Steffensen were rewritten for this volume.

Authors give quite different emphasis to individual, interactional and collective factors. While some focus on second-order constructs (verbal patterns) others highlight first-order activity. All concur, moreover, that human experience arises as we co-ordinate with artifacts and each other. Literal meaning is often secondary even in making and construing written texts. Järvilehto et al. (this volume) demonstrate that, in reading aloud, people generate meaning and, using gaze, test expectations against inscriptions. Textual patterns are imbued with sense as we couple dynamics with the feeling of thinking. Given that co-ordination allows us to project meaning onto the text while monitoring its physical features, this exemplifies how we act as *Organism-Environment Systems* (Järvilehto, 1998). In this same spirit of body-world interdependence, Kravchenko (this volume) turns to social change in Russia. Rejecting symbol-first (or 'code') models of language, he argues that, with changing reading (and teaching) habits, the educated are losing inferential skills. With the abandonment of intensive study of (above all) literary texts, inference-making is in decline. While conjectural, the paper emphasizes differences between reading and dialogue: social reality depends on interaction between these *cognitive domains*. Reading, for example, gives us cognitive powers based on orienting to our selves as, among other things, observers of what we read.

Other papers focus on how artifacts influence cognitive dynamics. Using an insight experiment, Fioratou and Cowley (this volume) contrast solutions between concrete and abstract versions of a task. They find, first, that using artifacts makes the task easier. Second, they argue, this is because they contribute to the functioning of the distributed cognitive system (see, Hollan et al. 2000) without being intrinsically *cognitive* (c.f., Giere, 2004). It is sufficient that human parts of the functional system co-ordinate with objects such that, on occasion, insight arises. By analogy, it is through active engagement with documents, programs, books and carvings that they come 'alive'. As action human sense-making is constrained by objects and/or wordings. Remarkably, Tylén et al. (this volume) apply a similar logic to visual objects. Building on fMRI studies of how brains activate when experimental participants look at images that show various arrangements of everyday items (e.g. chairs), they map their findings onot verbal reports. In comparing descriptions of 'signal' images with ones depicting everyday scenes, they find that, in the former case, people offer other-oriented descriptions. Their intersubjective reports evoke collective values. While the examples are aesthetic, the same logic may well apply to axiological questions.

Continuing the cultural theme, Tribble (this volume) reconsiders Elizabethan/ Jacobean performances of Shakespeare's plays. Enacting a performance was more important than reiterating verbal (or coded) content. Company sharers, together with hired men, used material resources to improvise. Unlike actors who remain true to a text, they recreated what they imagined. Performing as *distributed cognitive systems*, they linked verbal patterns, gestures, metrical patterns in a public space. Given how Shakespeare's work was performed, his writing shows collective influence. Certainly, collectivity illuminates feats like performing 6 plays in the same period. Next, Van Heusden (this volume) turns to intra-cranial resources. On his *double processing hypothesis* we develop internal signs based on perceiving differences. Though human memories never correspond to events, they stabilize reality and release us from the flowing present by introducing doubt. This shapes the mimetic semiosis which, for

Donald (1991), underpins language and technology. In regarding language as a form of cognition, van Heusden's view contrasts with that of the other contributors.[4]

The final papers develop ecological themes. Rejecting rules or value-free norms, Hodges (this volume) presents language as a caring system. It augments our perceptual and actional powers by realizing values that connect an individual with a collective domain. This is ecologically special and shapes human modes of being. Next, Rączaszek-Leonardi (this volume) addresses how language can be both symbolic *and* dynamic. Using biosemiotics, she suggests that, just as in living systems, no symbol can be abstracted from the meshwork in which it has evolved. As a result of constant renewal the meshwork's dynamics function to enable and constrain social activity. Symbols measure dynamics, exert control and, crucially, prompt human measuring. Since the 'same' symbols allow many interpretations, language integrates events across real-time, development and evolution. Finally, Steffensen (this volume) spells out why it matters that language is non-local: he emphasises how, as individuals, we contribute to linguistic cognition. As a result, we learn to act, not autonomously, but as responsible beings whose values realizing is crucial to the functioning of the extended ecology.

6. Imbumba: doing things together

The symbiotic nature of language ensures that while its dynamics prompt us to action, what is said constrains what we do together. For biocultural agents like ourselves, while genes and brains matter, much also depends on wordings, artifacts and other non-local phenomena (e.g. the exchange of 'turns', face, money, education). Language combines skilled activity with how verbal and other recurrent patterns stabilize ways of living and working. While English lacks a term for this co-activity, in isiZulu, it is called *Imbumba*. As Donald (1991; 2007) suggests, skilled practices are likely to have co-evolved with language and culture. However, while van Heusden (this volume) traces the results to *semiotic cognition*, others stress how we anticipate what we (and others) will perceive. Even reading is creative. Though more empirical work is needed, this sets up a debate. Whilst van Heusden emphasises brain-bound processes, Järvilehto and Steffensen focus on non-neural Organism-Environment relations. For Kravchenko (this volume), the resulting language meshwork (or overlapping 'consensual domains') give us the skills that connect up our powers. In reading, for example, we can make much use of how we orient to our changing selves. For Hodges, seeking out and grasping the affordances of *words* enable them to "reflect cultural preoccupations and ecological interests" (this volume: *page*). In human cognition, biological constraints prompt us to engage with each other in a world of cultural norms and institutions. Verbal patterns, and hearing, prompt us to individuate as members of social groups.

Semiotic cognition is compatible with human heterogeneity. For van Heusden (this volume), this is because semiotics indexes absence. There are no determinate linguistic entities and, equally, no sign possesses a (fully) specifiable meaning. Cultural phenomena are fuzzy or, in Hodges' (this volume) terms, first-order languaging realizes values. This is compatible with seeing theatre as the re-enactment of a shared vision.

[4] In *Distributed language and dynamics*, Cowley, (2009a) suggests that van Heusden separates language from behaviour. He denies this: "I wouldn't say that I separate language from behavior. On the contrary – I see cognition, and within cognition, language, as forms of behavior…. I also stressed that language is social through and through. The double processing hypothesis is a hypothesis about human cognitive behavior" (van Heusden, personal communication).

History may have ensured that Shakespeare's theatre was poised "between performance and poem." Tribble (this volume) suggests that this shows in not only textual details but, equally in the performers' practices and resources. Their heterogeneity exploits sensitivity to flow and, perhaps, human alienation (the inability to get signs quite right). Indeed, regardless of whether due to brains or a cultural ecology, there is convergence. Several contributors invoke of the inherent doubleness that appears when language is seen from a distributed perspective. While most explicit in *semiotic cognition*, a duality of symbols and dynamics reappears in Rączaszek-Leonardi's view of biology. It also arises in Tylén et al.'s (this volume) contrast between what we report in images that vary between, on the one hand, personal response and, on the other, descriptions that reflect on inter-subjective attitudes.

Deeper analysis calls for explanation of how we can hear utterances, see texts and perform plays as we do. Echoing Ross (2007), Tribble suggests that distributed resources give us shared *meaning spaces*. In *Imbumba* moments, people engage in flow and, at other times, experience alienation. We often have to deal with non-recognition of signs and, on many occasions, come to see differently. Meaning arises as, together, we use dynamics to restructure our thinking. While appeal to material symbols permits only endless reshuffling, innovation is necessary if living beings are to rely on non-local resources. Precisely because these do *not* have the same 'meaning' for each person, we innovate as we co-ordinate (see, Hollan et al., 2000).[5] Given non-local patterns, wordings prompt novel thoughts. In Imbumba moments, perturbances arise as linguistic resources trigger thoughts, feelings and habits (and vice versa). For Rączaszek-Leonardi (this volume), because we cognize the world, symbols become part of who we are. This happens because they constrain biodynamics as we speak, listen, think and, indeed, read/ create texts. Far from extending an inner mind, a history of co-ordination ensures that they come to be appropriated for realizing values. This applies during talk, reading aloud or silently solving insight problems.

In reading aloud, languaging occurs when we do not inhibit. As Järvilehto et al. (this volume) show, *Fixation Speech Intervals* throw light on what we expect to see. The measures show that readers seek out what they expect to articulate. In dialogue too, we anticipate what other people will say (and do). Just as Fioratou and Cowley (this volume) find in solving the insight problem, we rely on monitoring opportunities. Agency uses material structures that invoke norms as, in problem solving, we seek out solutions. While insight can depend on conscious processes, it can also use serendipity. Given a language stance, events can generate insight. As Tylén et al. (this volume) report signal-like images also set off improvisation. Given brains that ready us for interpretation, it is likely that a history of languaging leads to neural redeployment. When we anticipate, Tylén et al. (this volume) argue, Broca's area contributes to interactive sense-making and meaning constructing. Indeed, the distributed view gives new weight to how, during co-ordinated activity, situations prompt us to both use routines and, where these fail, to come up with novel modes of acting and/or speaking.

7. Future Prospects

[5] A defining feature of distributed cognition is that cognitive processes are "distributed through time in such a way that the products of earlier events can transform the nature of later events" (Hollan et al. 2000).

In viewing language as co-ordination, new meaning spaces arise. While the volume invites readers to change their view of language, this requires a double shift of perspective. It is not enough to acknowledge that brains control action and that language is distributed. It also needs to be seen that, because language is constantly renewed in the social meshwork, there is no need for verbal patterns to be represented 'in the head'. Indeed, it is this insight that allows us to overthrow symbol-first models and, in their place, highlight the unfinalizability of language. The importance of this phenomenon is clearest in Imbumba moments or those in which we *strive* to understand how a task can be accomplished. For example, in reading this paper, many will have picked up allusions to Heidegger, Wittgenstein, Davidson and others. While none of these names have appeared in the text, acts of writing create a fluid surround that can be evoked (vaguely) by a reader (a potential 'consensual domain'). Those with relevant skills and experience can use un-named sources to enrich their own acts of reading. Intertextuality arises, in cognitive terms, as we connect dynamical and symbolic aspects of language. Rączaszek-Leonardi puts it thus:

> The two perspectives do look at a single phenomenon. The most fascinating challenge is coming to understand how they relate to one another. Out of dynamical languaging, we come to discern patterns of sound that yield to formal (albeit 'leaky') descriptions. In this way an ordered system of sounds connects with a rich dynamics (this volume: *pp*)

We trace social reality to how, during first-order activity, voices set off sense-making. To echo Wittgenstein (1978) concepts force themselves on us or, in Heidegger's (1971 terms, *language speaks*. By opening up such ideas, the DLG perspective offers new challenges to the naïve realism that grounds post-Saussurian linguistics. To the extent that we succeed, this will show that dialogue shapes the cognitive dynamics from which language emerges. For now, one hypothesis is that, far from needing to re-use linguistic signifiers, we rely on anticipating results. Co-ordinated sense-making embodies thoughts: we depend on *dynamics first and symbols afterwards*.

References (to be revised)

Bakhtin, M. M. 1981. *The Dialogic Imagination: Four Essays*. (Trans. C. Emerson & C. Holquist, ed. M. Holquist). Austin: University of Texas Press.

Bakhtin, M. M. 1986. *Speech genres and other late essays* (Trans.V.W. McGee & C. Emerson, M. Holquist (eds.). Austin: University of texas Press.

Carr, P. 2007. "Internalism, externalism and coding". *Language Sciences*, 29/5: 672-689.

Clark, A. 1998. "Magic words: how language augments human computation". In P. Carruthers and J. Boucher (eds) *Language and Thought: Interdisciplinary Themes*. Cambridge: Cambridge University Press, 162-183.

Clark, A. 2008. *Supersizing the Mind: Embodiment, Action and Cognitive Extension*. Oxford: Oxford University Press.

Cowley, S. J. 1994. *The Place of Prosody in Italian Conversations*. Unpublished PhD, University of Cambridge.

Cowley, S.J. 2004. "Contextualizing bodies: how human responsiveness constrains distributed cognition". *Language Sciences*, 26/6, 565-591.

Cowley, S. J. 2007a. "The Codes of Language: turtles all the way up?" In M. Barbieri (ed) *The Codes of Life*. Berlin: Springer, 319-345.

Cowley, S.J. 2007. "Cognitive dynamics and distributed language". *Language Sciences*, 29/5: 575-583.
Cowley, S.J. 2009a. "Distributed language and dynamics". *Pragmatics & Cognition*, 17/3: 495-507.
Cowley, S.J. 2009b. "Language flow: opening the subject". *Cognitive Semiotics,* 4: 64-92.
Cowley, S. J. In press. "Taking a language stance". To appear, *Ecological Psychology*, 2011.
Dennett, D.C. 1991. "Real patterns". *The Journal of Philosophy*, 88 (1), 27-51.
Donald, D. 1991. *The Origins of the Modern Mind*. Cambridge MA: Harvard University Press.
Donald, M. 2007. "The slow process: a hypothetical cognitive adaptation for distributed cognitive networks". *Journal of Physiology – Paris*, 101: 214-222.
Fioratou, E. and Cowley, S.J. This volume. "Insightful thinking: Cognitive dynamics and material artifacts". In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*.
Fowler, C. 2010. "Embodied, embedded language use". *Ecological Psychology*, 22; 286-303.
Gibson, J.J. 1979. *The ecological approach to visual perception*. Boston: Houghton Mifflin.
Giere, R. N. (2004) "The problem of agency in scientific distributed cognitive systems." *Journal of Cognition and Culture*. Vol. 4(3/4), pp. 759-774.
Goffman, E. 1959. *The Presentation of Self in Everyday Life*. New York: Anchor Books.
Harnad, S. 2005. "Distributed processes, distributed cognizers and collaborative cognition." *Pragmatics and Cognition*, 13 (3): 501-514.
Harris, R. 1981. *The Language Myth*. London: Duckworth.
Heidegger, M. 1971. "Language". In: *Poetry, Language, Thought*. London: Harper Collins, 185-208.
Hodges, B. 2007. "Good prospects: Ecological and social perspectives on conforming", *Language Sciences*, 19/1 584-604.
Hodges, B. & Fowler, C. 2010. "New affordances for language: Distributed, dialogical and dynamical resources". *Ecological Psychology*, 22; 239-253.
Hodges, B. This volume "Ecological pragmatics: values, dialogical arrays, complexity and caring". In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*.
Hollan, J., Hutchins, E., & Kirsh, D. 2000. "Distributed Cognition: Toward a new foundation for human-computer interaction research". *ACM Transactions on Computer-Human Interaction, 7*, 174-196.
Hutchins, E. 1995a. *Cognition in the Wild*. Cambridge, MA: MIT Press.
Hutchins, E. L. 1995b. "How a cockpit remembers its speed". *Cognitive Science 19*, 265–288.
Järvilehto, T. 1998. "The theory of the organism-environment system: I. Description of the theory". *Integrative Physiological and Behavioral Science*, 33, 321-334.
Järvilehto, T. 2009. "The theory of the Organism-Environment System as a basis of experimental work in psychology". *Ecological Psychology*, 21:112–120.

Järvilehto, T. Nurkkala, V.M and Koskela, K. This volume "The role of anticipation in reading". In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*.

Jennings, R.E. & Thompson, J. J. In press. "The biology of language and the epigenesis of recursive embedding" To appear, Interaction Studies.

Kirsh, D. 2006. "Distributed cognition: a methodological note". *Pragmatics and Cognition*, 14 (2): 249-262.

Kravchenko, A. 2006. "Cognitive linguistics, biology of cognition and biosemiotics: Bridging the gaps". *Language Sciences* 28 (1): 51-75.

Kravchenko, A. 2007. "Essential properties of language: why language is not a digital code". *Language Sciences*, 29 (5): 650-621.

Kravchenko, A. This volume. "The experiential basis of speech and writing". In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*.

Linell, P. 2005. *The Written Language Bias in Linguistics: Its Nature, Origins and Transformations*. London: Routledge.

Linell, P. 2009. *Rethinking Language, Mind and World Dialogically: Interactional and Contextual Theories of Sense Making.* Charlotte, NC: Information Age Publishing.

Love, N. 2004. "Cognition and the language myth". *Language Sciences*, 26: 525-544.

Love, N. 2007. "Are languages digital codes?" *Language Sciences*, 29 (5): 690-709.

Maturana, H.R. 1988. "Reality: The Search for Objectivity or the Quest for a Compelling Argument". *Irish Journal of Psychology*, 9,(1): 25-82.

Mead, G. H. 1932. *The Philosophy of the Present*. Chicago: Open Court.

Pattee, H.H. 2008. "Physical and functional conditions for symbols, codes and languages". *Biosemiotics*, 1: 147-168.

Peirce, C. S. 1940. "Philosophy and the Sciences: a Classification": In J. Buchler (ed.) *The Philosophy of Peirce*. London: Routledge, 60-73.

Port, R. 2010. "Rich memory and distributed phonology". *Language Sciences, 32/1:* 43-55.

Rączaszek-Leonardi, J. In press. "Symbols as constraints: the structuring role of dynamics and self-organization in natural language". In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*..

Rączaszek-Leonardi, J. & Kelso, J.A.S. 2008. "Reconciling symbolic and dynamic aspects of language: toward a dynamic psycholinguistics". *New Ideas in Psychology*, 26:193-207.

Ross, D. 2000. "Rainforest realism". In D. Ross, A. Brook and D. Thompson (eds.) *Dennett's Philosophy: a Comprehensive Assessment.* Cambridge MA: MIT Press, 147-168.

Ross, D., 2004. "Metalinguistic signalling for coordination amongst social agents". *Language Sciences* 26(6), 621–642.

Ross, D. 2007. "H. sapiens as ecologically special: what does language contribute?" *Language Sciences*, 16 (1): 710-731.

Saussure, Ferdinand de [1916] 1983: *Course in General Linguistics* (trans. Roy Harris). London: Duckworth.

Spurrett, D., 2004. "Distributed cognition and integrational linguistics". *Language Sciences, 26/6*: 497-501.

Steffensen, S. This volume "Beyond mind: an extended ecology of languaging." In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*.

Steffensen, S. & Cowley, S.J. 2010. "Signifying bodies, health and non-locality: the aftermath". In Cowley, S.J., Steffensen, S. & J.C. Major (eds.), *Signifying Bodies: Biosemiosis, Interaction and Health*. Braga: Portuguese Catholic University Press, 331-355.

Thibault, P.J. In press "First-order languaging dynamics and second-order language: the distributed language view". To appear, *Ecological Psychiology.*

Trevarthen, C. 1979. "Communication and co-operation in early infancy: A description of primary intersubjectivity". In M. Bullowa (ed.), *Before Speech*. Cambridge: Cambridge University Press, 321-347.

Tylén. K. Phillipsen, J.S. and Weed, E. This volume "Actualizing semiotic affordances in a material wWorld." In S.J. Cowley (ed.) *Distributed Language.* Amsterdam: Benjamins, *XX=YY*.

Van Heusden, B. This volume "Semiotic cognition and the logic of culture". *Pragmatics and Cognition*.

Whitehead, A. 1926. *Science and the Modern World.* Cambridge: Cambridge University Press.

Wittgenstein, L.W. 1958. *Philosophical Investigations.* (2nd ed.). Blackwell: Oxford.

Stephen Cowley is a Senior Lecturer in Developmental Psychology at the University of Hertfordshire, UK. Although his PhD and early career were in Linguistics, since 2000 he has lectured in Psychology and Cognitive Science. Recent empirical work has focused on interactions between mothers and infants, children and robots, and simulations of health emergencies. He founded and co-ordinates the *Distributed Language Group*, a growing community who aim to transform the language sciences by focusing on how directed, dialogical activity imbues human intelligence with a collective dimension.