Charles Goodwin*

Building Action in Public Environments with Diverse Semiotic Resources

Abstract

Human beings build action by bringing together structurally different kinds of phenomena (talk, gesture, prosody, multi-party participation frameworks, material structure in the world that is the focus of their work, etc.) into contextual configurations where they mutually elaborate each other to create a whole that is not found in any of the constitutive parts. This provides a framework for the public, distributed organization of action and cognition in two distinct, but deeply interrelated ways. First, actions themselves have a distributed organization in that they contain within them a host of diverse meaning-making practices that draw upon distinct, complementary forms of semiosis. Second, the public character of these diverse resources makes it possible for an action to be socially distributed in the sense that a variety of different kinds of actors can participate in its organization, both simultaneously, and sequentially as subsequent actions are built as interpretants of prior ones. Such phenomena contribute to the theme of this special issue in that they demonstrate how "cognition is not an isolated process, but happens in and through complex interactions between subjects, language, material artifacts and an environment that is both physical and interwoven with shared constructions of meaning." These processes are investigated in two quite different kinds of materials: first, the practices through which an aphasic man with a three world vocabulary is constituted as powerful speaker in conversation; and second, the work of archaeologists as they see and uncover structure in the dirt they are excavating.

Keywords

Public semiosis, semiotic heterogeneity, distributed cognition and action, aphasia as social practice, human interaction.

0. Introduction

In their call for a special issue of Versus focused on the external mind Fusaroli, Granelli and Paolucci highlight as a topic for systematic study "the polyphony of a mind irreducible to processes happening under the skin of the individual". The present paper will investigate this by looking in detail at how Chil, an aphasic man with almost no lexicon, is nonetheless able to act as a powerful speaker in conversation, to construct rich and complex meaning, by linking his limited signs to the talk of others within temporally unfolding courses of collaborative action. It will be argued that human action in general is characterized by semiotic polyphony in that it is built by joining different kinds of semiotic materials with highly varied properties (for example linguistic structure, prosody, embodied action, semiotic structure inscribed on material objects, etc.) into configurations within which

* University of California and Los Angeles (UCLA); goodwin@hummet.ucla.edu

these partial signs build a larger whole by mutually elaborating each other. Semiotic heterogeneity sits at the heart of human action. Participants build action by secreting diverse semiotic structure into a public environment where others build subsequent action through practices that include systematic transformations of the semiotic materials provided by their predecessors. This process is inherently social and temporal and thus, by virtue of its intrinsic organization, extends beyond the skin of the individual.

A specific example of such a process is provided in Figure 1. Before discussing it, it is relevant to briefly describe the abilities of Chil, a main participant in this interaction who suffers from severe aphasia.

1. Chil's Abilities

In 1979, when Chil was 65 years old, a blood vessel in the left hemisphere of his brain ruptured. He was left completely paralyzed on the right side of his body and with a vocabulary that consisted on only three words: ***Yes***, ***No***, and ***And***. Despite this he continued to function as a powerful actor in conversation, and indeed had an active social life in his community, going by himself to a coffee shop in the morning, doing some of the family shopping, and so forth.

Despite the limitations of his vocabulary Chil retains an extensive repertoire of other semiotic resources. First, his understanding of what others are saying, the language they produce, is excellent. Second, he has very expressive prosody, which he produces over both his ***yes***'s and ***no***'s and over "nonsense" syllables such as "duh", which seem to be spoken precisely to carry relevant prosody (Goodwin et al. 2002). Third, though completely paralyzed on his right side, Chil uses his left hand to produce a varied and important range of gesture, including pointing (Goodwin 2003b, 2006) and hand shapes displaying numbers (Goodwin 2003a). Fourth, by living at home with his family and caretakers in the town that has been his community for almost forty years, he inhabits a world that is not only meaningful, but which can be recognized in relevant ways by those around him. Chil can tie to this visible sedimentation of public meaning by using actions such as pointing to invoke consequential phenomena in his surround in powerful ways. However his inability to accompany that pointing with relevant language typically produced puzzles to be unraveled, rather than transparent reference.

2. The Distributed Organization of Action

Line 14 of Figure 1 provides a typical example of Chil's spoken language[1]. Because of the damage to his brain he is completely unable to

[1] Talk is transcribed using a slightly modified version of the system developed by Gail

combine a range of diverse linguistic signs into richly structured novel sentences. His entire utterance here consists of the words "No No". If one were to conceptualize semantics as simply an inventory of signs that carry conventionalized meanings Chil would seem to lack the ability to construct utterances with complex semantics. Within a framework that focuses analytically on the complexity of the isolated utterances that can be produced by a self-sufficient, competent speaker (and such a framework constitutes the point of departure for much analysis in fields such as formal linguistics), all that Chil is able to do in line 14, at the top of Figure 1 is signal negation.

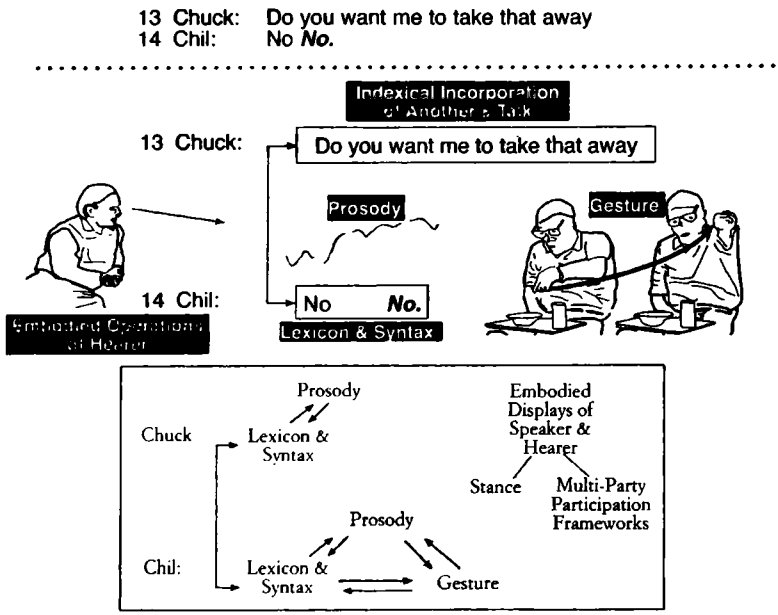

Figure 1: The Pragmatic Organization of Semantics Within Ongoing Semiosis

Jefferson (see Sacks et al. 1974: 731-733). Talk receiving some form of emphasis (e.g., talk that would be underlined in a typewritten transcript using the Jefferson system) is marked with bold italics. Punctuation is used to transcribe intonation: A period indicates falling pitch, a question mark rising pitch, and a comma a continuing contour, as would be found for example after a non-terminal item in a list. A colon indicates lengthening of the current sound. A dash marks the sudden cut-off of the current sound (in English it is frequently realized as glottal stop). Comments (e.g., descriptions of relevant nonvocal behavior) are printed in italics within double parentheses. Numbers within single parentheses mark silences in seconds and tenths of a second. A degree sign (°) indicates that the talk that follows is being spoken with low volume. Left brackets connecting talk by different speakers mark the point where overlap begins.

However sequentially Chil's action in line 14 is an instance of what conversation analysts describe as Second Pair Parts (Sacks 1995; Sacks et al. 1974), actions that are built as responses to something said by another. Understanding what Chil says here requires taking into account not only what he says, but also the structure of the talk that his action is responding to. From a Peircean perspective Chil's utterance in line 14 constitutes an interpretant of what Chuck said in line 13, and must be understood within the framework of this entire multi-stage sign complex, which is unfolding within a dynamic process of ongoing semiosis. Thus Chil is not heard to be saying "No" in decontextualized abstraction, but instead to be objecting to the specifics what Chuck proposed. More precisely, Chil is properly heard to be saying that he doesn't want Chuck to "take that away". Indeed, in the longer sequence from which this exchange is drawn, Chil uses variants of "No no" repetitively to reject a range of proposals made by Chuck, and in each case his action is heard to encompass a quite different proposition (Goodwin 2010).

It is quite literally impossible for Chil as an isolated individual to construct anything like the sentence built by Chuck in line 13. However, as seen here, he is able to use the pragmatic organization of the sequentially unfolding processes of semiosis within which his action is embedded to construct utterances that indexically incorporate into the structure of his own limited utterances complex lexical and syntactic structure produced by others (see also Du Bois 2007; Ochs et al. 1979), and thus to build action through talk that displays complex, varied, locally relevant semantics. While Chil's lexicon is impoverished, his semantic abilities are rich, but require the actions of others to become manifest.

Chil's utterance in line 14 thus has a distributed organization. Different actors in 1) alternative positions (Chuck is trying to work out what Chil is asking him to do, while Chil knows what this is, but doesn't posses the semiotic repertoire required to state it), and 2) at different moments in time (Chuck through what he says in line 13 and Chil in line 14), construct different parts of the unfolding sign complexes that make it possible for Chil to build an appropriate next action to Chuck's by saying something appropriate and meaningful. Note, that despite the crucial distributed organization of the process through which Chil is able to say something, he is nonetheless highlighted as a distinct individual with something unique to say by these very same processes. Chil creatively uses what Chuck said to strongly disagree with the proposition stated by Chuck.

The processes just described are manifestations of an "external mind" in the strong sense that public semiosis is crucial to their organization. In order to engage in the practices found here Chil must be able to perform systematic operations on sign complexes, such as Chuck's utterance, that have been produced by others and placed within a public arena. To build his own action Chil incorporates semiotic structure constructed by others.

The interactive practices found here are not unusual, or restricted to people with aphasia or other language problems. Instead such ongoing incorporation, with transformation, of the materials provided in earlier sign complexes is a regular, systematic component of the process through which subsequent action is built by constructing interpretants that operate on prior signs. Indeed, it constitutes a pervasive, and most consequential example of what Eco (1984) has referred to as infinite semiosis. The progressive transformation of public sign complexes is central to not only the processes through which meaning is revealed and changed within the unfolding organization of public, multi-party interaction, but also to the construction of the actions through which participants build together the events that constitute their endogenous social and cognitive worlds.

The phenomena examined so far can be understood by taking into account only the written version of the talk spoken by Chuck and Chil that appears at the top of Figure 1. Reflecting what Linell (2005, 2009) describes as a "written language bias" much research in linguistics has used as its primary source of data those elements of human languaging that can be captured in writing, such as lexical and syntactic structure. However, as is indicated in the second part of Figure 1, Chil's action encompasses a range of resources that are not included within a transcription of his talk, or within the scope of "language" as narrowly conceived. Prosody and gesture are central to the intelligibility of the action Chil is constructing here.

Throughout the longer sequence from which this exchange is drawn, Chuck is trying to figure out something that Chil wants him to do. Within mundane conversation a **No** that rejects a proposal, such as the one Chuck makes in line 13, typically does not stand alone, but instead is accompanied by an account that explains why the proposal is being rejected (Sacks 1995), or offers an alternative. The pointing that accompanies Chil's "No ***No***" in line 14, does precisely this by indicating to Chuck something that he should take into account in order to arrive at an appropriate understanding of what Chil is trying to say (it later becomes clear that Chil wants to offer some of the fruit they have been eating to Chuck's wife, who is walking outside in the direction where Chil is pointing; however, Chuck doesn't know this, and is unable to make appropriate sense of the point, despite repeated guesses such as that in line 13). Chil thus produces a complex two component utterance, with one component occurring within the stream of speech while the other is found in his visible pointing gesture. With his prosody Chil inflects the talk he produces with a particular stance. Throughout the longer sequence highly variable prosody over very similar lexical items (double **No**'s as in line 14) constructs a range of quite different, locally appropriate action (Goodwin 2010).

The semiotic fields relevant to the organization of action here extend beyond a single actor such as Chil. In order for Chil's gesture

to function as a relevant sign in the organization of his action it must be perceived and attended to by its addressee. The mutual orientation of the participants bodies toward each other creates a framework that indexically grounds both the gesture and talk that occurs within this embodied configuration (Goodwin 2007; Kendon 1990a, 1990b). More generally, within interaction talk is constructed not by speakers alone, but instead requires the collaborative operations of a hearer (Goodwin 1981). Most of the relevant displays produced by hearers occur not in the stream of speech, but take the form of visible displays of orientation, and operations on emerging talk such as nods (Goodwin 1984) and assessments (Goodwin and Goodwin 1987; Goodwin 1980). Neither the utterance, the turn-at-talk, nor the sentences that emerge within these arrangements are single party activities, but instead phenomena organized within a distributed field of action that includes both structurally different kinds of participants (speakers interacting with different kinds of hearers), and different kinds of sign processes lodged with different media.

In sum, Chil's actions as a speaker have a distributed organization in several different senses. First, by virtue of the way in which his negation indexically incorporates the specifics of the action being opposed, part of what he is saying is to be found in talk produced by another, the prior speaker whose actions are being objected to. Second, there is a distribution of semiotic materials in that each of his individual utterances is constructed through the juxtaposition of very different kinds of resources which enter into a dynamic relationship with each other. This semiotic heterogeneity gives Chil the ability to compose varied, flexible action with utterances in talk, despite severe restrictions on his own ability to produce linguistic structure.

3. Layering Semiotic Structure

As noted above one characteristic way that human beings build action is by bringing together a range of quite diverse semiotic resources with very different properties (for example language structure, prosody, gesture, embodied participation frameworks, sequential organization and varied phenomena in the world around them such as hopscotch grids, Munsell color charts, maps, tools of various types, etc.) into local configurations within which these different kinds of resources mutually elaborate each other. The simplest way to demonstrate the pervasiveness and relevance of this is to investigate specific examples. Both of the sequences in Figure 2 are drawn from videotapes of interaction at an archaeological field school. Both are analyzed in more detail in other published work (Goodwin 2000, 2007).

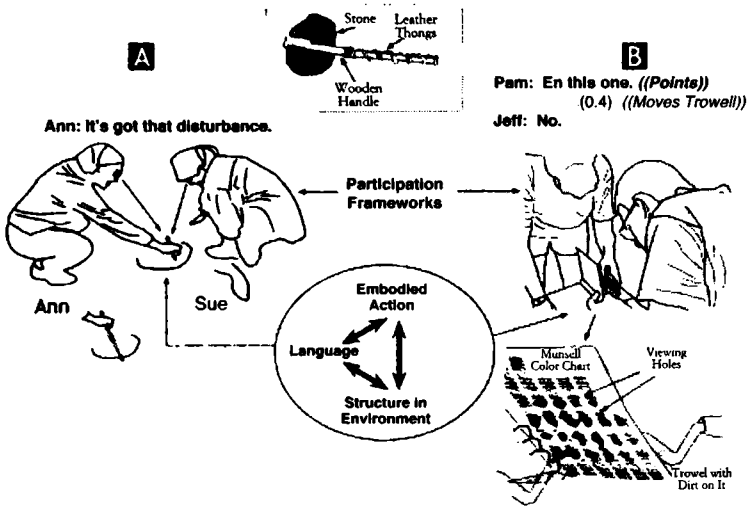

Figure 2: Building Action Through the Mutual Elaboration of Different Kinds of Semiotic Resources

In **A**, on the left side of Figure 2, Ann, the senior archaeologist who organized the field school, is working with Sue, a new student, who must use her trowel to outline archaeological structure (an ancient post-mold) visible in the color patterning of the dirt they are excavating. To show Sue something relevant Ann uses a combination of 1) **Language** "It's got that disturbance"; 2) **Gesture**: as Ann speaks she uses her right hand to move back and forth over a long dark patch in the dirt. As she does this her hand has an inverted U shape, so that her fingers indicate the width of the patch, while her moving hand shows its length; and 3) **Structure in the material environment**. Sue could not adequately understand what Ann is telling her by looking only at the gesture. Instead she must attend to the shape in the dirt that Ann's gesture is indicating. She is being instructed to see not a moving hand, but a pattern that is relevant to her work, one that is being extracted as a figure by the gesture from its embedding within what is quite literally a complex ground, indeed the dirt of the earth itself.

Each of these different meaning making resources exists within a different medium and each has very different properties. The gesture and pattern in the dirt are apprehended visually; the language by listening to what Ann is saying. Both the talk and gesture disappear as soon as they occur, while the stain in the dirt has been present for hundreds of years.

Sue could not properly grasp what Ann is telling and showing her if she did not take all of these fields into account. These different semiotic resources are not only brought into a dynamic relationship, but each

mutually elaborates the others. Thus the term "disturbance" in the talk classifies the pattern in the dirt as a particular kind of entity that is relevant to the work they are doing. Basically a disturbance is something that has obscured, deformed or partially destroyed the archaeological feature they are trying to map. Here the long straight stain marks the path of a farmer's plow that has destroyed part of the older post-mold that is the focus of their scrutiny. The deictic expressions "it" and "that" direct Sue's attention to first the larger pattern they are working on ("it"), and second a subpart of that pattern ("that"), and "that" also indexes both the pattern and Ann's gesture. The gesture itself precisely delineates where the disturbance is to be found in the dirt, something not done by the talk itself. The visible patterning in the dirt provides a concrete example of just what kinds of phenomena encountered in the dirt are to be treated as disturbances. The stain is a mute color pattern; the gesture indicates a place that should be focused on in the dirt, but does formulate the relevance of such looking; the talk provides both deictic instructions and categorization; but neither the deictic expressions, not the formulation can be properly understand without simultaneously attending to what is being categorized.

A simple example of new structure emerging from the combination of unlike resources can be found in the stone hand axe at the top middle of Figure 2. In isolation neither the stone, nor the leather thong, nor the wood used for the handle, constitutes an axe. However when they are brought together into a configuration that allows each to mutually contribute to the structural possibilities of the others, something new, and moreover something that makes possible distinctive forms of action, emerges.

A similar constellation of diverse practices and semiotic resources is found in B on the right in Figure 2. It demonstrates how semiotic heterogeneity makes it possible for the work and knowledge of distant others to be included in the detailed organization of local action. Pam on the left and Jeff on the right are classifying the color of a sample of dirt they are excavating. To do this they are using a Munsell chart, a reference tool constructed by color scientists, using the variables of hue, chroma and value. Here the Munsell chart takes the form of book of carefully printed pages, one for each color hue with a grid of color patches on each page that vary with respect to a combination of chroma and value. Next to each color patch is a small hole. The archaeologist puts a wet sample of the dirt to be categorized on the tip of a trowel, and then moves the trowel from hole to hole until the best match between the dirt and an adjacent color patch is found. The tool constructed by the color scientists provides the current participants with an architecture for perception (Goodwin 1995), a way of seeing and classifying the world that is the focus of their work. Here Jeff is holding the trowel while Pam, a more experienced graduate student, looks through the holes with him to try to determine the correct color.

Pam uses her finger to point to a particular color patch while saying "En this one". Deictic structure in her talk instructs the addressee to locate the particular patch on the Munsell page that is being indicated with her pointed finger. Once again action is being built by bringing together language structure, embodied action (the finger making a deictic point) and structure in the environment. Here two quite different kinds of phenomena are brought into conjunction with each other through Jeff's embodied actions with the chart and trowel. A bit of the world that is the focus on the archaeologists' work and scrutiny, some of the dirt they are excavating, is placed under a material object that provides a theoretical framework for categorizing a specific aspect of that dirt. It is precisely here that the dirt enters the semiotic world of archaeological description and theory. This is the place where nature, a patch of dirt, is transformed into culture. Once again, the action in progress could not be grasped by attending to any one of these fields in isolation from the others. Moreover, the different fields have quite diverse structure and organization. By using the Munsell chart Pam and Jeff are able to incorporate into the structure of their local action a physical object that encapsulates solutions found by others to the cognitive task of color classification they are now faced with (Hutchins 1995).

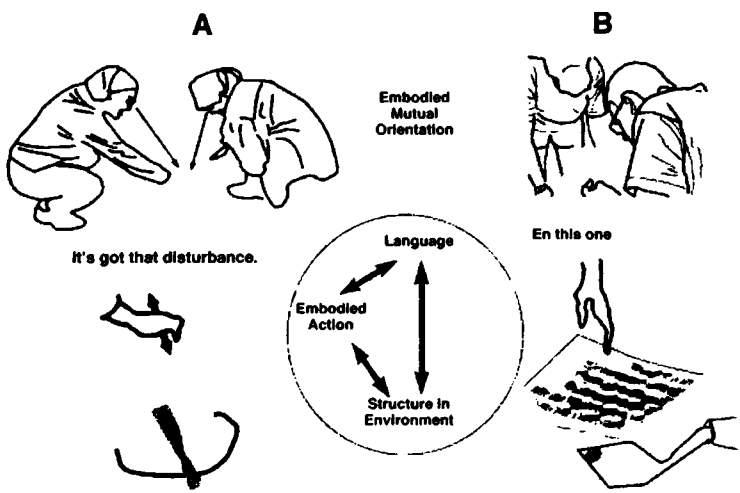

Figure 3: Layers of Diverse Semiotic Resources

Goffman's (1981) decomposition of the speaker into a laminated structure of different kinds of actors raises the possibility of thinking about the combinatorial structure of the actions found here as consisting of a series of layers. Figure 4 provides a simple graphical representation of this (it is es-

sentially an exploded picture of the different kinds of action found in Figure 2). At the bottom in both **A** and **B** is the dirt, the ground itself in **A**, while in **B** a sample of dirt has been placed on the tip of a trowel. Providing some demonstration of the flexibility inherent in such constellations, in **B**, on the right, something not found in **A** occurs: a Munsell color chart has been placed above the dirt being examined. In both **A** and **B**, hands performing different kinds of pointing gestures occur next. Finally, co-occurring language is an essential component of both of these configurations.

There are limitations to this metaphor in that it does not address the dynamic interplay between these layers, and depict clearly enough the way in which each helps shape how the others will be understood. Moreover it provides a somewhat static picture of structures that are in fact constituted through a continuous process of transformation as interaction unfolds. Elsewhere I have described this organization as the arrangement of ***semiotic fields*** — signs instantiated in a variety of different media with diverse properties — within changing ***contextual configurations*** (Goodwin 2000). The metaphor of layers does, however, help to clarify thinking about the intrinsic heterogeneity of action by providing a simple model of how action is built through diverse semiotic materials that are juxtaposed to each other.

In addition to the conjunction of language, the body and the world found in each of these actions (indicated by the circled triangular structure in Figure 2), that complex as whole, which constitutes the current focal action, is framed by the embodied mutual orientation of the participants toward both each other and the world that is the focus of their work, what Goffman (1964: 64) called an "ecological huddle". These multiparty semiotic structures shape the ongoing organization of the parties toward each other, construct joint attentional frames (Tomasello 1999), and provide a framework where other kinds of sign exchange processes, such as talk and gesture can occur (Goodwin 1981, 2007; Kendon 1990a, 1990b).

The work practices of archaeologists might seem esoteric, and thus not a general picture of how action is built. However, as seen in Figure 2, phenomena as basic and pervasive as utterances are also built through the simultaneous juxtaposition of structurally different kinds of semiotic resources, such as linguistic structure and prosody.

4. Conclusion

It has been argued in this paper that both action and meaning are constructed by bringing together semiotic materials with quite different properties into contextual configurations where they mutually elaborate each other. However, much research has taken as its point of departure the isolation of single systems. One example of this can be found in the way in which human language has been defined for the field of linguistics.

In a prescient statement Saussure (1959: 16) envisioned a general science focused on "the life of signs within society". However Saussure then argued that linguistics should confine its study to just one part of this larger field by investigating language as an isolated self-contained whole:

> A science that studies the life of signs within society is conceivable; it would be a part of social psychology and consequently of general psychology; I shall call it 'semiology' (from Greek *semeion* 'sign'). Semiology would show what constitutes signs, what laws govern them. [...]. *Linguistics is only a part of the general science of semiology; the laws discovered by semiology will be applicable to linguistics, and the latter will circumscribe a well-defined area within the mass of anthropological facts.* [emphasis added]
> To determine the exact place of semiology is the task of the psychologist! The task of the linguist *is to find out what makes language a special system within the mass of semiological data.*

Language is thus demarcated as a "special system" that not only can be, but should be, investigated without reference to other semiotic processes with which it characteristically co-occurs. More generally, analysis should focus on specific, coherent well-bounded semiotic systems as self-contained wholes. Delimiting the scope of inquiry in this way, and thus defining the phenomenal and analytic field within which all subsequent inquiry will occur, has enormous consequences. It establishes a geography of inquiry that locates a range of phenomena as central to subsequent investigation, while rendering a host of other phenomena invisible. Thus, by taking as its primary analytic object the well-formed grammatical sentence, formal linguistics in the second half of the twentieth century could ignore both the social and the pragmatic organization of language. By restricting itself to those aspects of languaging that could be captured in writing (Linell 2009), crucial phenomena, such as the visible actions of hearers, became invisible, and were completely ignored in a field focused on an ideal speaker-hearer (Chomsky 1965: 4).

This is not in any way to deny the tremendous analytic gains that have been accomplished by sustained, in-depth focus on a restricted domain of phenomena, such as language, in the way that Saussure envisioned it (though see Volosinov 1973). However, it is appropriate to step back and question whether starting analysis by partitioning the world being investigated into what might appear transparently, without needing further reflection, to be clearly different kinds of phenomena, such as language, the body, individual psychology as opposed to social organization, material objects, etc., is the only, or even the best way to proceed.

The present paper has focused on how human beings build action by bringing together structurally different kinds of phenomena (talk, gesture, prosody, multi-party participation frameworks, material structure in the world that is the focus of their work, etc.) that mutually elaborate each other to create a whole that is not found in any of the constitutive parts. This pro-

vides a framework for the public, distributed organization of action and cognition in two distinct, but deeply interrelated ways. First, actions themselves have a distributed organization in that they contain within them a host of diverse meaning-making practices that draw upon distinct, complementary forms of semiosis. Second, the public character of these diverse resources makes it possible for an action to be socially distributed in the sense that a variety of different kinds of actors can participate in its organization.

Clear examples of this distributed organization can be found in both the way that Chil built meaning and action with almost no lexicon, and in the in-situ fieldwork of the archaeologists. Chil, constituted himself as a speaker by indexically incorporating rich linguistic structure produced by others into his own utterances through sequential tying. Simultaneously he attached his rich and variable prosody, and stance, to both his own catastrophically impoverished lexicon, and rich linguistic structure being produced by someone else. Both his speakership and his utterance were distributed in that 1) they were built through the co-articulation of diverse meaning-making practices with very different properties, only some of which Chil could master; and 2) someone other than Chil constructed the linguistic signs crucial to his utterance, so that his action incorporated the semiotic activities of multiple participants. Similarly, archaeologists, in order to do their work in the sequences we looked at here, built action that simultaneously incorporated language, gesture and structure in the material environment, as well as embodied participation frameworks. By looking at dirt through the holes of the Munsell chart, while pointing at particular squares on the chart, the archaeologists incorporated into the local structure of their action the prior work of their predecessors who, when faced with the task of classifying color, constructed the Munsell chart. As with Chil the archaeologists' action encompassed the diverse contributions of different kinds of actors and different kinds of semiotic materials.

Sitting at the center of both the practices of the archaeologists, and the processes through which Chil accomplishes meaning and action in concert with others, is the construction of action through semiotic heterogeneity. Different kinds of meaning making resources, distributed across participants, language, the body and features of the setting, are juxtaposed to each other to create distinctive action and knowledge that cannot be found within any of the parts examined in isolation. This is compatible with the model of semiosis proposed by Eco (1984: 113) in which "every sign (linguistic and non-) is defined by other signs (linguistic and non-), which in turn become terms to be defined by other representations (even if ideal)". Such processes, in which different kinds of signs reflexively elaborate each other in ways that are central to the constitution of both meaning and action, can be clearly seen in the activities of both the archaeologists, and the man with severe aphasia in Figures 1 and 2. All of this is occurring within a Peircian process of progressively, and simultaneously, unfolding semiosis through linked interpetants. Within

each action the diverse signs brought together within a contextual configuration (Goodwin 2000) constitute simultaneous interpretants for each other (e.g., the linguistic category "disturbance" and the pattern in the dirt indicated by the gesture mutually constrain and shape the interpretation of each other). Sequentially, as events move forward, subsequent actions, such as Chil's ***No No***'s, obtain their local sense and relevance through the ways in which they constitute interpretants of prior actions. It is only within such a dynamic process of progressive transformation of public, heterogenous sign complexes that Chil's rich semantics can be pragmatically constituted in concert with others, despite his catastrophically impoverished lexicon. The rich, diverse, open-ended, and mutually reflexive chains of interpretation made possible by unfolding semiosis are his most crucial resource. They make it possible for him to incorporate into the interior of his own actions rich materials constructed by others.

Such processes are quite relevant to the perspective enunciated in the call for papers for this special issue of *Versus* on The External Mind, with its focus on semiosis, distribution and situation in cognition. Both the work of the archaeologists, and interaction with Chil, demonstrate how "cognition is not an isolated process, but happens in and through complex interactions between subjects, language, material artefacts and an environment that is both physical and interwoven with shared constructions of meaning". As Chil tragically demonstrates cognition is not located in an individual mind or body but instead "is distributed and situated in a bundle of practices and emerges as a mediated process between a plurality of instances that cross and redefine the biological barriers of the individual".

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