Available online at www.sciencedirect.com

SciVerse ScienceDirect

Journal of Pragmatics 46 (2013) 8–23

journal of PRAGMATICS

www.elsevier.com/locate/pragma

The co-operative, transformative organization of human action and knowledge

Charles Goodwin

Applied Linguistics, UCLA, Los Angeles, CA, United States

Received 17 December 2011; received in revised form 30 August 2012; accepted 3 September 2012

Abstract

Focusing on a range of features that are central to the constitution of action, this article is an empirically based theoretical contribution to the field of research attempting to understand how human sociality is established and sustained. Human action is intensely, perhaps uniquely, co-operative. Individual actions are constructed by assembling diverse materials, including language structure, prosody, and visible embodied displays. Semiotically charged objects, such as maps, when included within local action, incorporate ways of knowing and acting upon the world that have been inherited from predecessors. New action is built by performing systematic, selective operations on these public configurations of resources. The way in which a single action encompasses different kinds of resources makes possible 1) distinctive forms of co-operative social organization as alternatively positioned actors contribute different kinds of structure to a single shared action (e.g., the talk of a speaker and the silent visible displays of hearer work together to construct a turn-at-talk and the utterance emerging within it); and 2) the accumulation and differentiation through time within local co-operative transformation zones of dense substrates that create a multiplicity of settings for action. Each setting for action must be inhabited by competent members who have mastered the culturally specific practices required to perform the activities that animate the lifeworld of a particular community. Through the progressive development of, and apprenticeship within, diverse epistemic ecologies, communities invest their members with the resources required to understand each other in just the ways that make possible the accomplishment of ongoing, situated action. Human beings inhabit each other's actions.

Keywords: Co-operative action; Substrate; Aphasia as social practice; Human tools; Epistemic ecology; Laminated action; Prosody as combinatorial practice; Situated knowledge; Co-operative transformation zone

1. Building human action

Action is central to both human language and human sociality (Enfield and Levinson, 2006; Levinson, 2012; Sacks et al., 1974). Within face-to-face interaction the intrinsic dialogic organization of language (Linell, 2009) is constituted as an emerging, multi-party process as participants assemble action and units by operating on a range of different kinds of semiotic materials that each is producing with an orientation toward the other (Goodwin, 1979, 1980, 2000; Iwasaki, 2011; Kaukomaa et al., in press). This paper will investigate how actions are built by performing systematic operations on a public substrate which provides many different kinds of resources that can be reused, decomposed, and transformed. In so far as such processes preserve with modification structures provided by the environments that constitute the point of departure for new action, this process is accumulative, something that is central to the distinctive organization of human culture and society. Through such accumulation highly varied settings, cultures and distinctive ways of knowing and

E-mail address: cgoodwin@humnet.ucla.edu.
URL: http://www.sscnet.ucla.edu/clic/cgoodwin/.

0378-2166/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.pragma.2012.09.003

1 Tony: Why don't you get out my yard.
2 Chopper: Why don't you ***ma***ke me get out the yard.

Fig. 1. Building new action by reusing with transformation resources provided by a public substrate.

operating upon the world are created and lodged endogenously within particular communities. Members of such communities thus face, as part of the intrinsic organization of action itself, the task of building new members who can be trusted to see, understand and act upon the world in relevant ways.

2. Structure-preserving transformations on a public substrate

Actors can build new action by selectively reusing resources provided by a prior action. Fig. 1 provides an example.[1] Chopper, in line 2, uses Tony's own words against him by employing "***ma***ke me" to embed Tony's challenge within a new counter-challenge of his own.

Chopper constructs his utterance in line 2 by 1) decomposing the language structure provided by Tony's (i.e., he snips Tony's utterance into two parts so that he can insert his own new talk between these segments), while 2) adding new materials in order to produce a quite different action of his own. Chopper thus builds subsequent action by operating on Tony's utterance as a public semiotic structure that provides him with resources that can be re-used to build a new action of his own. Building subsequent utterances through decomposition, reuse and transformation of language structure provided by another is a central locus for grammar as a form of public, social practice.

This process of building new action by reusing, with transformation, public resources that can be found in the environment being used as a point of departure for emerging action is quite general.[2] It will be a constitutive feature of all of the actions to be examined in this paper. For clarity I will call the materials being operated on, such as Tony's talk in line 1, a *substrate*.

Two features of this process have special importance. First, the subsequent actor does not simply repeat the substrate, but instead reuses with modification the resources it provides to transform the substrate and change it into something new (this can of course occur even when the words remain unchanged, as demonstrated for example by the different referents of ***you*** as speakers change). Second, despite such modification, the materials made available by the original substrate are preserved in a relevant and consequential form. This process of simultaneously 1) preserving structure provided by the activities of earlier actors while 2) systematically modifying that structure to build something new, is a central, distinctive feature of human action, one that makes it possible for human culture and knowledge to accumulate in a systematic fashion. For example Isaac Newton developed his law of universal gravitation by building upon, while generalizing and transforming, Kepler's laws of planetary motion, which in turn were made possible by Kepler's access to the astronomical observations of Tycho Brahe.

Building new action by performing operations on an existing public substrate is central to how participants grasp the meaningfulness of subsequent talk. Consider for example a turn-at-talk that consists entirely of the word ***No***. By using this word disagreement is built by performing a specific operation on public structure produced by someone else: the utterance and action being opposed. The word ***No*** is not heard as an amorphous objection to just anything in the world, but instead as objecting to precisely what was just said. ***No*** does not stand alone as an isolated self-contained unit. Instead it incorporates as a crucial feature of its own organization what was said by someone else in the prior turn.[3] If this prior substrate is not attended to and taken into account, the action produced by the word ***No*** is not properly understood. This may seem thoroughly mundane (as indeed it should if it is a manifestation of a very general feature of human action).

Consider, however, the case of a person whose entire vocabulary consists of words such as ***Yes*** and ***No***. 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 of only three words: ***Yes***, ***No***, and ***And***. As a speaker Chil has almost no syntax. He can produce limited arrangements of ***Yes's*** and ***No's*** (e.g., "No no", "No no no", "Yes No", "Yes And") but these mark the limits of his ability to combine linguistic signs together. Does this mean that he lacks the ability to build action by combining signs into complex wholes? With such a restricted lexicon Chil might seem to lack the ability to

[1] See Goodwin and Goodwin (1987b) for more detailed analysis of such format tying or dialogic syntax (Du Bois, forthcoming).

[2] Conversation analysts note that turns-at-talk that are NOT be heard as tied to the utterance they follow, (from the perspective of the present argument as not to be analyzed as operations on the current local substrate) characteristically begin with an explicit misplacement marker (Schegloff and Sacks, 1973).

[3] Note the extraordinary lecture by Harvey Sacks on Tying Techniques (1995:716–21).

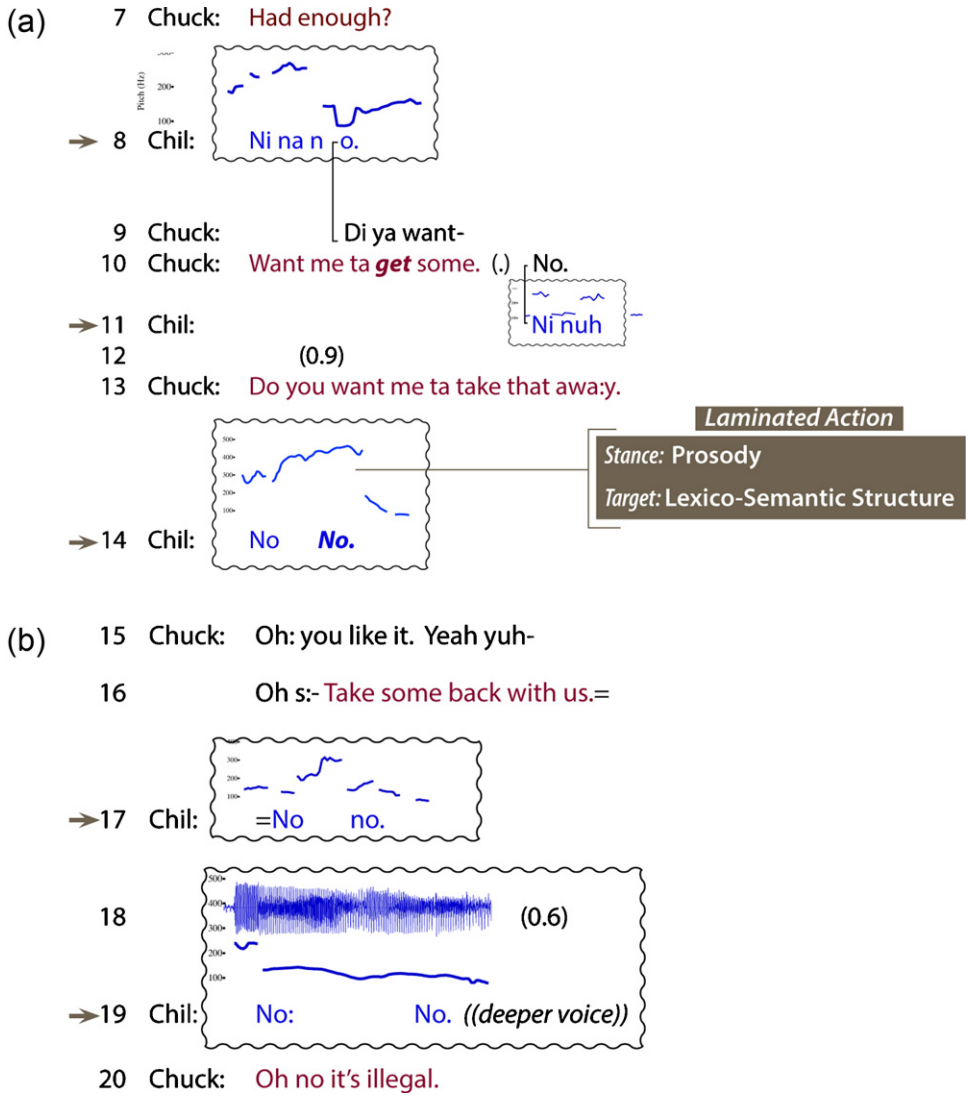

Fig. 2. Diverse action with the same lexicon.

produce the rich, flexible combinations of different signs that are a hallmark of human language. Despite this he continued to function as a powerful speaker in conversation. How was this possible?

Rather than treating language as an isolated, self-contained system, Chil builds utterances by combining structurally different kinds of resources within configurations where each is mutually elaborated by the others,[4] that is, as a form of co-operative action. Despite his catastrophically impoverished lexicon Chil retains rich, fluent prosody. Goodwin (2010b) describes a situation in which Chil is trying to get his son Chuck to do something by repetitively pointing first toward a bowl on his lap with the remains of a grapefruit he has just eaten, and then in front of him. He seems clearly to want Chuck do something with the grapefruit. However, despite repeated guesses, Chuck cannot figure out what action is being requested. In this sequence almost all of Chil's utterances have virtually identical lexical content: variants of ''No No'' as Chil rejects candidate proposals made by Chuck (Fig. 2).

[4] For other recent analysis of how action is built through the simultaneous use of different kinds of semiotic resources see Agha (2007), Barth-Weingarften et al. (2010), Enfield (2009), Heath et al. (2010), Hindmarsh and Pilnick (2007), Kendon (2009), Mondada (2009), and the papers in Streeck et al. (2011).

Chil's utterances in Fig. 2 are built by performing systematic operations, — basically forms of strong disagreement — on talk just produced by Chuck. Each of Chil's ***No No***'s incorporates as a crucial component of its own relevant meaning the immediately prior talk being objected to. Thus, as an action, line 11 tells Chuck that Chil does not want him ''ta ***get*** some'', while line 14 is heard to be saying that Chil does not want Chuck to take ''that'' (the bowl with the remains of the grapefruit) away, and line 17 tells Chuck that he should not ''take some back with us.'' With almost identical lexical content, each of these utterances builds a different kind of action, and, moreover, one that is fitted in fine detail to the local environment from which it emerges. Despite his catastrophically impoverished vocabulary, Chil is able to talk about many different things with fine precision by using ***No*** to indexically incorporate into his own action rich language structure provided by others (Goodwin, 2007b). While his lexicon is poor, indeed almost nonexistent, Chil's semantics are rich because of the way his talk is built by performing structure-preserving transformative operations on a substrate created by others.

2.1. Substrates as organizational resources within human interaction

For clarity it is useful to be more explicit about why I am choosing to use the term *substrate* to describe the local public configuration of action (such as Huey's utterance in line 1 of Fig. 1) that is operated on (frequently through processes of decomposition, reuse and indexical incorporation) to build a next action. In biochemistry a ''substrate is a molecule upon which an enzyme acts,'' a process that transforms it ''into one or more products'' (http://en.wikipedia.org/wiki/Substrate_(biochemistry)). This process of transforming the resources provided by a present environment into something new is consistent with the transformative processes I am focusing on here. My initial interest in substrates was triggered by reading hypotheses proposing that during periods of intense volcanic activity in the early earth pumice rafts might have provided substrates that enabled the initial chemical formation of life. Such rafts could concentrate and help select ''the diversity of chemical reactants needed for life'' while also providing compartments where relevant reactions could occur (Brasier et al., 2011:725). A place where diverse semiotic resources can be brought together and accumulated through time into a public configuration that allows new action to be built through precise, local operations on this complex, is central to the perspective on human action being developed in this paper. The notion of substrate provides a way of focusing with clarity on emergent, local configurations of semiotic heterogeneity as sites of transformation.

In very interesting work Ingold (2011:10) uses the term substrate to describe a blank surface that is given shape by having structure imposed on it by an actor. My use of the term is quite different in that I focus on how the substrate, and the resources it provides, make possible specific forms of subsequent action. Chil's situation provides one example of how crucial substrates are as troves of resources for the construction of meaning and action. Chil's daughter Pat noted that Chil's memory actually improved after his stroke. To build coherent, novel statements, he required a substrate with specific resources he could appropriate and operate on to show others what he was thinking (Goodwin, 2007b). When he thought of something he wanted to tell others he was therefore frequently put in the position of having to work actively to keep this in mind until he could find a substrate (typically in someone else's talk) that he could exploit to make public what he wanted to say.

A substrate is not simply an encompassing context, but instead an immediately present semiotic landscape with quite diverse resources that has been given its current shape through the transformative sequences of action that culminate, at this moment, in the current action. The quite limited set of resources that construct the current action constitutes the point of departure for the action to be produced next. Like the pumice rafts that selectively concentrated a particular array of chemicals in a contained environment, the current substrate organizes coherence by gathering together a limited, but uniquely appropriate, collection of resources implicated in the organization of the specific actions now in progress. Participants not only attend to just these resources (such as the words Huey used to build his initial challenge in Fig. 1 or Chuck's immediately prior talk in Fig. 2), but actively use them to build in concert with each other subsequent meaning and action that emerges coherently from what just gone before, and which provides the materials for the construction of what will happen next.

3. The laminated organization of human action

Chil's talk in Fig. 2 contains not only lexical items but also rich, highly varied prosody. In Goodwin (2000) I argued that human beings build action by gathering together different kinds of signs each organized within a distinctive medium that is crucial to its organization. Thus the semiotic structure provided by a hopscotch grid makes relevant action possible only when it is inscribed on a medium that allows actual bodies with weight to jump through it. Each of these contextures of specific forms of semiosis (lexical structure, prosody, visible embodied displays, etc.) organized within a particular medium can be called a *semiotic field*, and the set of semiotic fields participants demonstrably attend to in order to build the action of the moment, can be called a *contextual configuration*. This productive heterogeneity, the ability to construct action through the simultaneous use of different kinds of materials, sits at the heart of human action.

For conciseness and clarity in this paper I have focused on Chil's simultaneous use of the lexical items ***No No***, and prosody in Fig. 2, but a range of other semiotic fields, including gesture and bodily orientation are also crucial to the organization of the actions he builds there (Goodwin, 2010b, 2011). The term *lamination* will be used to describe a set of different semiotic fields organized as layers of diverse resources. Through there are limitations to *lamination* as metaphor I am choosing to use it for several reasons. First, I find that the visual metaphor offered by the notion of lamination — a set of layers organized with reference to each other — provides a simple and vivid way to look clearly at how a variety of semiotic fields with quite different properties work co-operatively with each other simultaneously to build evanescent actions that might endure for only a few seconds, but which have rich, analytically interesting complex internal structure (see Fig. 2). Using the notion of lamination to organize the display of data, as most of the figures in this paper do, allows us to move beyond a mere record of the words spoken to try to find what Wittgenstein (1958:§122) termed ''a perspicuous representation [which] produces just that understanding which consists in 'seeing connexions'.'' Thus it allows us to see substrates in a simultaneous as well as a sequential fashion, and to look clearly at how specific semiotic fields contribute to the differential meaning-making practices that work together to build particular actions.

Second in classes at the University of Pennsylvania when I was a graduate student, Erving Goffman, then in the process of developing his deconstruction of the speaker that eventually appeared in ''Footing'' (Goffman, 1981), pointed frequently to the laminated organization of both actions and participants within human interaction. By this he meant that their organization encompassed layers of different kinds of phenomena (thus a single utterance might contain the quite different voices of a character being animated, and the stance and commentary of the current speaker on the talk being quoted). While not applying the model he developed in ''Footing'', which focused exclusively on the speaker, I continue to find the notion of lamination a productive resource for separating analytically the different kinds of structure that participants draw upon to build action in concert with each other.

3.1. Delaminating talk and action provided by others

The laminated structure of action, the way in which it is composed of layers of different kinds of semiotic materials, is something that participants in interaction can disassemble and reorganize in order to build subsequent action. Once again, Chil provides an example.

Chil's ability to use lamination to creatively build action is not restricted to his own impoverished vocabulary. He can attach rich and expressive prosody to lexically and syntactically complex talk constructed by others, and thus use their words and linguistic ability to say things that would be impossible for him alone. Fig. 3 provides an example.

Chil's son Chuck, who lives in California, is visiting Chil at his home in New Jersey. There is a relevant distribution of knowledge between the primary addressee, Chuck, on the one hand, and Chil and Pat on the other. Pat is Chil's daughter, and lives near him in the New York area. They are discussing a friend of Chil's, who Chuck recognizes, but Pat knew well. The talk to be examined here thus occurs within an epistemic ecology in which Chuck is an Unknowing Recipient, while Chil and Pat are Knowing Recipients (Goodwin, 1981).

After Chuck in line 1 of Fig. 3 asks if the friend being talked about was a radiologist. Pat, in lines 7–8 responds that he was chief of radiology at a prestigious hospital, Columbia Presbyterian Medical Center. Pat tells Chuck this without any heightened evaluation in her prosody. However, in line 9 Chil overlaps what Pat is saying with a string of syllables containing an extended prosodic contour. This enables him to display a strong evaluative stance to what Pat is saying. In essence he re-laminates Pat's utterance by replacing her prosody with his own, while retaining, and using for his own purposes, the rich lexicon and grammatical structure that she has constructed. Since his talk is produced simultaneously with Pat's, I am not able to isolate their intertwined contributions to obtain separate pitch tracks to display the different prosody of each speaker. Indeed, their co-occurring action in overlap is precisely the phenomenon now being pointed to analytically.

Chil does not simply affiliate to what Pat is saying, but adds a new evaluation to the news she reports, transforming Pat's report of an occupation into a formulation of his friend as someone who occupied a special, exalted position. Some demonstration that the participants themselves in fact treat what Chil is doing as such an assessment is provided by Chuck's ''Wow.'' in line 14. Further support for the assessable status of what Chil is doing is provided by the subsequent development of the sequence. This reformulation of what Pat was saying constitutes the point of departure for a new, independent telling by Chil (not to be examined here).

With his prosody Chil says something that Pat does not, while using the content of her talk to do this. He thus acts as an independent speaker in his own right, rather than as someone who is merely affiliating with what Pat is doing.

Chil's ability to transform Pat's action by replacing her prosody with something different demonstrates how action is constituted through the dynamic interplay and mutual elaboration of different semiotic fields. The words used to state a proposition in Chil's and Pat's utterances are quite literally identical, since they are produced by Pat alone. However, Chil and Pat each construct a subtly different action by using prosody to laminate a unique stance display on this common

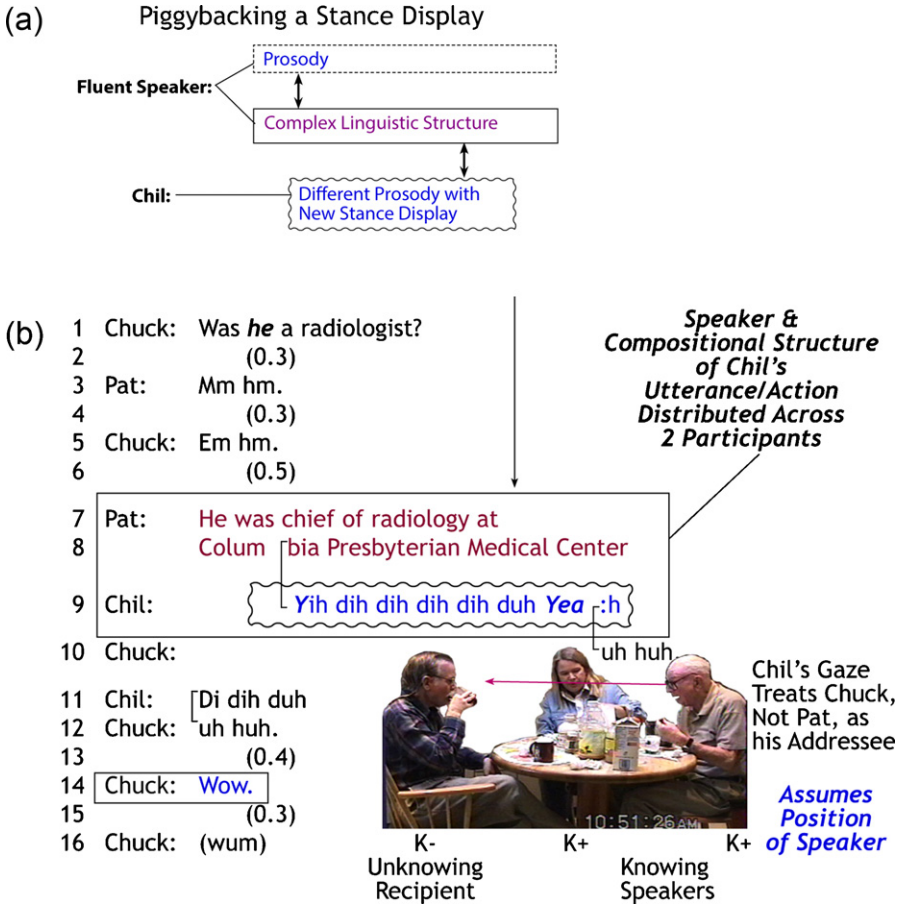

Fig. 3. Appropriating the language abilities of others.

linguistic structure. Chil builds his action by using rich prosody to perform simultaneous, transformative operations on the substrate provided by Pat. Indeed, though most analysis of how action can be built and understanding is displayed within talk-in-interaction has focused on its sequential organization, for example how the understanding of an utterance is revealed through a subsequent response to it,[5] the simultaneous, concurrent organization of action is equally important. By providing different kinds of semiotic materials actors in structurally different positions (e.g., speaker and hearer, story teller and principal character, etc.) can contribute in consequential ways to the organization of a single action (Goodwin, 1980, 1984; Goodwin and Goodwin, 1987a; Iwasaki, 2011).

This has a number of theoretical consequences. For Chil, but I would argue for speakers in general, both the utterance and the speaker have a distributed existence. A crucial component of the talk that is central for proper understanding of Chil's utterances has been constructed by someone else, his interlocutor. His action is intrinsically co-operative (different participants produce the varied materials required for the actions he builds here) and deeply social in that he builds meaning through systematic operations on language structure provided by others. Using the distinctions provided by Goffman's deconstruction of the speaker (1981) Chil acts as the principal, the party responsible for stating particular propositions and constructing specific forms of action. However, the author of much of what he says, that is, the party who constructs the linguistic sign complex required to explicitly state the proposition required for the intelligibility of Chil's action, is someone else. Indeed, it would be literally impossible for Chil to construct by himself the sign complexes he needs to state the propositions found in his utterances here.

What happens here provides a vivid example of the argument made by Bakhtin (1981:293-94) that

[5] Thus Levinson (2012) argues that what action is assigned to a turn ''is revealed by the response of a next speaker''.

> The word in language is half someone else's. It becomes 'one's own' only when the speaker populates it with his own intention, his own accent, when he appropriates the word, adapting it to his own semantic and expressive intention. Prior to this moment of appropriation, the word does not exist in a neutral and impersonal language (it is not, after all, out of the dictionary that the speaker gets his words!), but rather it exists in other people's mouths, in other people's concrete context, serving other people's intentions: it is from there that one must take the word, and make it one's own.

It might be argued that what Chil does here is special and idiosyncratic, a creative but unusual adaptation to his inability to produce linguistic structure of his own. However, fully fluent speakers in mundane conversation also build action by decomposing the layers of semiotic fields that others use to build utterances. Goodwin and Goodwin (1992) describe a video-recorded interaction in which a speaker telling a story used elaborate paired hand gestures to depict a set of steps. A recipient then repeated these same gestures but attached them to new words, the children's song ''Little Bunny Fou Fou'', while soliciting appreciation of his heckling parody from another recipient. More generally phenomena such as next turn repair initiation (Schegloff et al., 1977) and aggravated correction (Goodwin, 1983), are frequently constructed by repeating part of what was said by the prior speaker in the last turn, while replacing the original prosody with a contour that displays doubt or opposition. Participants themselves thus not only treat utterances as complex structures assembled through the dynamic interplay of different layers of diverse semiotic phenomena (talk, prosody, gesture, etc.), but are able to decompose those structures and reuse parts of them, while changing how what has been appropriated is to be understood by embedding it within a new contextual configuration (Goodwin, 2000).

Chil's status as a speaker is revealed as well through the way in which he organizes his body. Rather than positioning himself as simply a recipient to what Pat is saying, he begins the utterance by raising his eyebrows toward Chuck while endorsing for him what Pat is saying. He then looks briefly toward Pat in the midst of his talk, but returns his gaze to Chuck well before his emphatic ''Yea:h'' that ends the turn (see the image in Fig. 3). The action he is performing by using his body to address Chuck in this way is telling someone about the status of his friend as news, an action that would be inappropriate to a knowing recipient such as Pat (who is in fact providing the words necessary to describe the position he occupied), but is appropriate to an unknowing recipient.

In most simple terms Chil builds an utterance with novel, complex lexicon and syntax by attaching a prosodic contour, with a new display of stance and evaluation, to talk being spoken and constructed by another.[6] Here we find a deconstruction of the speaker (Goffman, 1981) which distributes the activities that constitute visibly doing being a speaker into multiple bodies, and streams of talk being produced by separate actors, who are reflexively attending to each other and using each other's signs and actions as resources for the construction of their own. Chil's ability to act as a speaker here incorporates what Pat is saying as a crucial component of his own action. Rather than a model of the speaker that takes as its point of focus mental phenomena within the individual actor, here we find speakership being constituted through the ability to participate in appropriate but differentiated ways in a field of interactively sustained action constituted through the public organization of language use (what Linell (2009) describes as the intrinsic dialogic structure of human language and action).

Rather than being lost in this process Chil's cognitive and emotional life as an individual (for example, as someone with his own stance toward the events being described that differs from Pat's), is constituted as something that is public, consequential, vivid and flexible. These same issues are relevant to the organization of his agency. One issue that has emerged in the study of agency is the difference between individual and ''social'' agency, the latter typically being investigated as agency lodged within a social or corporate group, rather than an individual. In so far as Chil's agency is organized within ongoing processes of co-operative semiosis (e.g., appropriating signs constructed by others to do his work) it is thoroughly social. He requires the words of Pat to talk about the accomplishments of his friend, the radiologist, to Chuck. However, what emerges from this process is not the amorphous diffusion of his agency into a social group, but instead very vivid recognition by his interlocutors of Chil's agency as an individual, for example as someone who has something unique to say.

[6] Fritjof Sahlström, acting in the capacity of anonymous reviewer of this paper, noted how what Chil does when he decomposes the action provided him by Pat demonstrates crucial limitations to the notion of lamination as presented, without however denying its relevance. Fritjof notes that the model of lamination as originally presented is most appropriate to layers glued together to form a rigid, stable structure, such as a surfboard. Once built such a structure is difficult to disassemble. However, as demonstrated by the phenomena now being examined ''for human sociality the lamination is constantly and contingently moving, running along in vast resourceful fields of semiotic substrates. What is attended to are these possibilities for assembling resources, rather than the resources themselves. The assembled whole not only provides itself as a whole, but as something constituted by recognizable layers, which then are available for further elaboration by any participant. The social resin is more like the glue on the back of a Post-It than the kind of resin used when using fiberglass; it holds enough (and very reliably so) for its situated purposes, but once passed, it is easily removed, and what it held is no longer pre-configured.'' I am in complete agreement with this most insightful analysis. Operating on what I wrote as a substrate Fritjof improves my argument.

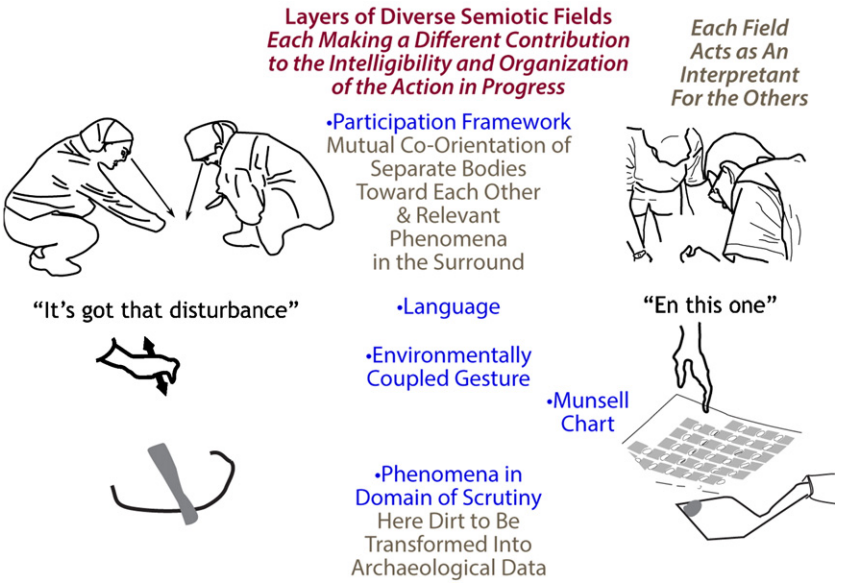

Fig. 4. The laminated structure of human action.

With respect to the larger argument of the present paper, actions emerge within environments constituted through the public presence of diverse semiotic resources. Action is fashioned in part by performing operations on this substrate. This combinatorial process makes it possible for actors to systematically incorporate structure and meaning built by others into the interior organization of their own action. By doing so they can invoke forms of knowing that would be impossible for them to display as isolated individuals. Human beings inhabit each other's actions.

4. The accumulative power of the laminated structure of human action

The way in which human actions are composed of layers of distinctly different kinds of semiotic materials provided Chil, faced with the limitations imposed by his aphasia, with crucial resources. By operating on laminations he was able to construct combinatorial action of his own, and to incorporate crucial semiotic materials found in other participants' action, for example their rich language, into new utterances of his own.

Environmentally coupled gestures (Goodwin, 2007a) use pointing to tie language to specific phenomena in the environment. Here again action is built by laminating layers of different kinds of semiotic resources together. Fig. 4 provides a simplified diagram of how such actions are built by combining separate semiotic fields, each of which makes a distinctly different contribution to the intelligibility and organization of the action in progress.[7] In the action depicted on the left a senior archaeologist is showing a student how to recognize a ***disturbance*** in the dirt they are trying to map. A disturbance is any later activity that distorts an archaeological feature that is the focus of study. Here a nineteenth century plow has moved dirt into part of the patterning that was created by a post that held up a house in a sixteenth century native American village. The professor on the left highlights the disturbance for the student by moving her hand over the colored stripe in the dirt left by the movement of the plow, while using her thumb and finger to indicate its width.[8]

In the action depicted on the right of Fig. 4 two young archaeologists are engaged in the task of systematically describing the color of some of the dirt they are excavating. To do this they use a Munsell color chart — a grid of color patches scientists have constructed to show relevant variations in color. Next to each color patch is a hole. A sample of the dirt to be classified is put on the tip of a trowel, placed under the chart, and moved from hole to hole so that the archaeologist can see in the same visual field both the dirt being classified and a particular reference color. When the best match is found the chosen color is then entered on a coding sheet as both grid coordinates, and a standard color name (Goodwin, 2000). Sue proposes a particular color as a candidate possibility by pointing toward it while saying ''En this one''. Jeff responds by moving the trowel with the dirt to the hole next to that color sample.

[7] I have also published this argument about layered structure of human action in Goodwin (2010a). I am including it here as well because it think it provides very important components of the larger argument being made in the current paper, and that this generalizes what was argued before.

[8] See Goodwin (2007a) for more extensive discussion of environmentally coupled gestures, including this sequence.

Note how in both of these examples pointing gestures are tied to something in the environment that is being carefully scrutinized by the participants.

In both examples in Fig. 4 participants build action by laminating different kinds of meaning-making resources together. Complementary semiotic fields include 1) the mutual orientation of the participants' bodies toward both each other, and the materials they are working with, which creates a public focus of attention and a locus for shared work; 2) language, including relevant deictic terms, organized within sequences of action within human interaction; 3) hands making environmentally coupled gestures (Goodwin, 2007a); 4) consequential phenomena in the surround that is being intensely scrutinized by the participants as part of the work they are doing together. Here what is being studied is dirt that is to be transformed into archaeological data.

The action on the right includes an additional semiotic field, the Munsell chart, that is not found in the action on the left. In that each of these layers constitutes a semiotic resource which is used by an actor to interpret another semiotic resource, the insertion of a new layer is not merely additive, but rather a transformative event that changes the organization of the entire configuration. The contingent inclusion of a range of different semiotic fields, such as the addition of the Munsell chart to the formal arrangement found on the left, provides an intrinsic source for variability, creativity, and intense local adaptation in the organization of human action. Rather than being restricted to a fixed repertoire, participants have the ability to incorporate quite diverse materials into the organization of the actions they are building together.

The Munsell chart itself is the accumulative product of a history of building frameworks for knowing the world in action-relevant ways by linking diverse materials with complementary properties into enduring configurations that provide architectures for perception. Its structure includes the patches of color which provide samples that can be pointed at and visually compared with the dirt being classified, a grid that makes possible the identification of any particular patch as a set of standard coordinates, color names, and the distinctive physical properties of its medium, paper, which permits holes to be cut to create the architectures for perception used by the archaeologists to compare dirt to be classified with color samples.

The way in which the work of our predecessors can be passed on to us in forms that provide organization in fine detail for current work, such as using the Munsell chart to classify the color of dirt, or a map to determine where in the ocean samples are being taken by oceanographers (Goodwin, 1995), or the specification within a legal system of what can count as a crime (Goodwin, 1994), shapes the epistemic activities being pursued by diverse communities in very fine detail. Indeed, these accumulative practices make possible particular forms of action, such as finding someone guilty or innocent, reading a recipe, or making a scientific map, that are specific to particular communities or activities (Knorr-Cetina, 1999). These frequently occur in a setting, such as a kitchen, a scientific lab, or a courtroom, where the resources necessary to accomplish such actions, with their distinctive epistemic requirements, have been gathered together to provide the infrastructure that makes it possible for particular forms of work and activity within a community to occur. Such ensembles, which span not only actors, but also generations and diverse semiotic materials, are central to the ways in which human knowing is organized as diverse forms of action.

As the sedimented product of a long history of work by others grappling with the question of how to systematically classify color, the Munsell chart did not suddenly appear at the moment it was needed, but was brought to the archaeological field site as part of the toolkit to be used for excavation. The local action depicted on the right of Fig. 4 thus reflexively incorporates systematic features of the setting where the action is being performed (the toolkit that organizes work at an archaeological excavation), as well as a history of relevant work by anonymous predecessors. Such accumulative histories provide a sedimentation of ways of knowing which are relevant to the signature activities of specific communities (Goodwin, 1994; Hutchins, 1995). They become incorporated into the epistemic organization of particular, local actions. Within such laminated action rich practices for categorization that are employed by only a subset of communities, such as using the Munsell chart to classify color, work seamlessly with more generic activities such as picking up dirt or other objects, performing comparisons, etc. Human action is less a universal typology of sharply differentiated action types, than a series of entanglements (Ingold, 2007) that invoke, and accumulate through time, locally relevant webs of semiotic and social relationships.

This same process of building subsequent action by performing operations on a public substrate, gives human action an intrinsically co-operative character, as each party builds upon structure provided by others. For example in Fig. 4, Sue builds action by operating on the chart being held by Jeff, and he in turn constructs his next action by operating on what she did: moving the trowel to the color patch she indicated. In Fig. 1 Chopper re-uses with transformation language structure addressed to him by Tony.

What is unique, generative and creative about human communities (including professions such as archaeology), is the richness and diversity of new forms of action, cognition, and ways of knowing the world (classifying color by peering through a Munsell chart, etc.) that emerge as humans transform the accumulated possibilities provided by the materials left to them by their predecessors into new, locally relevant forms of action, and frequently new settings (kitchens and labs, for example) reflexively tied to these actions. As argued by Wittgenstein (1958:§23) there are

> ''*countless* . . . different kinds of use of what we call ''symbols'', ''words'', ''sentences''. And this multiplicity is not something fixed, given once for all; but new types of language, new language-games, as we may say, come into existence, and others become obsolete and get forgotten.''

As eloquently argued recently by Heritage, ''the real-world distribution of knowledge and of rights to knowledge'' between participants (2012:24) is central to the organization of talk-in-interaction, something that ''must operate for every single turn at talk that embodies clausal elements'' (Heritage, 2012:24). As demonstrated quite clearly by how the Munsell chart organizes color classification of color for those who use it, the accumulative organization of action is both sustained by, and makes possible particular ways of knowing and understanding the world that is the focus of a community's scrutiny, e.g., enormously diverse human cultures. Where archaeologists see the traces of posts holding up an ancient house I see quite amorphous color patches in a bit of dirt. Such intricate awareness of the structure and possibilities for action provided by a particular inhabited setting is given central theoretical importance in the work of phenomenologists. Thus for Husserl (1936:142) the *lifeworld* ''is a grand theatre of objects variously arranged in space and time relative to perceiving subjects, is already-always there, and is the ''ground'' for all shared human experience.''

5. Co-operative transformation zones

The continuously generative variety of phenomenal objects such as categories, words sentences, and language games, noted by Wittgenstein, emerges in part from the way in which the intrinsic organization of mundane action provides a crucible for the transformation into something new of the substrate a current action uses as its point of departure.

All of the actions so far examined provide examples of *co-operative transformation zones* that decompose and reuse current resources to create something else. In Fig. 1 Chopper uses Tony's own words to build a counter to what has just been said. In Fig. 2 Chil's ***No***'s indexically incorporate what Chuck has just said to both reject what he proposed and, through lamination of prosody, to characterize Chuck's actions as inappropriate and lacking understanding of what Chil is trying to do. By adding new prosody to the words spoken by Pat in Fig. 3 Chil transforms her neutral description into an assessment that initiates a new sequence.

Both of the actions by archaeologists in Fig. 4 provide co-operative transformation zones that are central to the professional work being accomplished here. Through structure-preserving transformative operations on a substrate (indeed multiple substrates with the insertion of Munsell chart) the dirt that is the focus of professional scrutiny is transformed into the categories, such as a ''disturbance'' or a scientific color description, that shape archaeological practice (e.g., how the field site will be mapped and described). It is precisely here that ''nature'' (dirt itself) is transformed into the cultural phenomena that animate the work and discourse of archaeology as a profession. Moreover, what occurs here is but one step in an open-ended sequence of action organized through further structure-preserving transformations on the substrate brought into existence by the current work. The color category made possible by the Munsell chart will be written on a coding form. The categories of phenomena, such as ''disturbance'' now being located will help delineate the archaeological feature that the student is tracing in the sand with her trowel; the shape that emerges from this process will then be copied to an archaeological map. Both the maps and the coding forms will be brought back to the lab at the end of the field season to undergo further accumulative transformations, perhaps ultimately culminating in a publication.[9]

Action uses as its input the structure and resources of a current substrate and produces as its output a new, transformed substrate that will constitute the point of departure for the next action, etc. Even individual utterances by a single speaker demonstrate this accumulative organization through the way in which emerging elements of a sentence do not stand alone, but instead require the substrate provided by earlier parts of the utterance for their proper understanding. New parts of an emerging turn can transform the way in which what has been said so far is to be understood as action (Goodwin, 1979). The pervasiveness of co-operative transformation zones constituted within the midst of ongoing action is central to the accumulative organization of human culture, knowledge and social life.

6. Human tools

Human tools manifest the same co-operative, combinatorial formal organization that was just described for language use. Tools are included in the present paper to demonstrate that the phenomena being investigated, such as the co-operative organization of action, its construction from different kinds of resources, accumulative mutability within co-operative transformation zones, and intrinsic differentiated social organization, are not specific to talk, but instead manifestations of pervasive, general phenomena implicated in the organization of human activity. As was demonstrated

[9] See the discussion of chains of inscriptions in Latour and Woolgar (Latour and Woolgar, 1979).

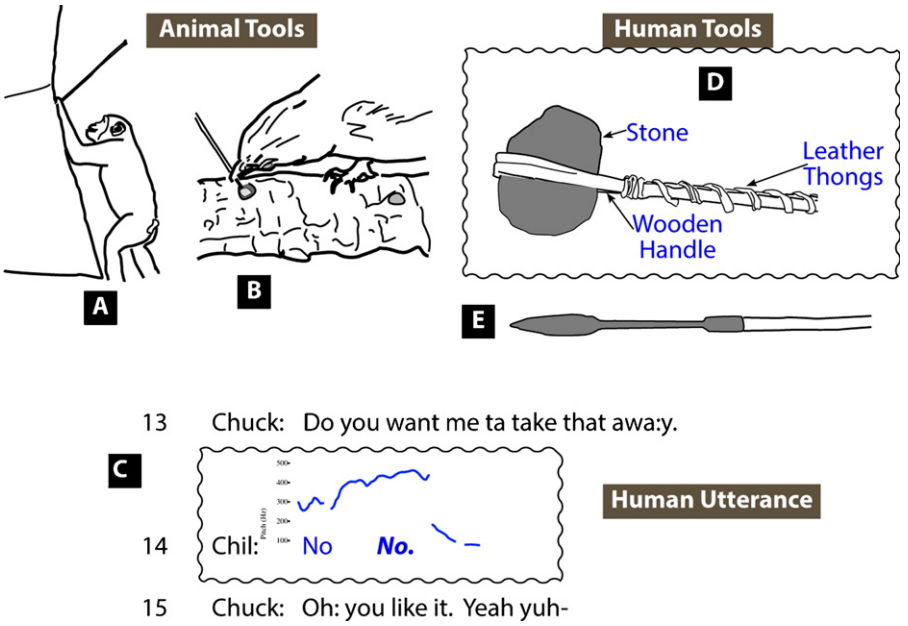

Fig. 5. The combinatorial organization of human tools.

above in the discussion of examples from archaeology, tools are also central to the laminated organization of action through which knowledge in a community is constituted.

Humans have been defined, in a tradition that extends to at least Aristotle, as the tool-using animal. However, it has been known for several generations that animals also use tools. **A** in Fig. 5 shows a chimp using a stick to extract termites from a tree. In **B** a Galapagos woodpecker finch is also using a stick to reach insects. In both these cases the tool being used by the animal is a single stick. Both of these examples (as well as sea otters using stones to open shell fish, etc.) fall within Fitch's (2010:154) definition of tools as ''detached objects, carried or held just prior to or during some goal-directed usage.'' This definition is important for what follows because it excludes phenomena such as termite nests, beehives and beaver dams, which are constructed through the complex (though to some extent stereotyped) arrangement of different kinds of parts, but which are organized on a time scale which is quite different from that of local, emergent action.

It was noted above that Chil, and humans in general, build utterances by flexibly combining different kinds of materials — lexical items and prosody for example — into a new whole. **C i**n Fig. 5 is from the extended sequence in Fig. 2 where Chil builds a range of different kinds of actions with the same two words ***No No*** by laminating a different prosodic contour onto each of his utterances. The unique properties of each material make a separate and distinct contribution to both the utterance and the action as a whole. What results is not a single ''thing'' or indivisible, monolithic action, but rather changing contextures of mutually elaborating phenomena organized as webs of relationships (Ingold, 2007:75). Chil's talk, and human action in general, is accumulative in that it builds from a substrate of prior resources, while constructing something new.

The tools being used by the animals in Fig. 5 do not typically have this (ac)cumulative combinatorial organization.[10] However, as persuasively argued by Reynolds (1993), human tools do. Though the sticks held by the animals operate on something else in the environment (poking into trees to get tasty insects), the tools themselves are not composed from separate parts (Goodwin, 2010c). They are not constructed as webs of interlocking resources which establish relationships between different kinds of materials and participants. They do not have an (ac)cumulative organization.

D in Fig. 5 is an ax constructed from three separate materials: 1) a large stone, 2) pliable wood wrapped around the stone to form a handle, and 3) leather thongs that tie the handle together tightly to hold the stone. If the ax is disassembled the ax itself cannot be found in any single part in isolation. Without the web of relationships that link these separate elements to each other to form a coherent whole what one finds is simply a stone or a strip of leather.

[10] However see the extraordinary of work of Anne E. Russon with ex-captive Orangutans being rehabilitated for release to free forest life, where phenomena such as compound tools are observed (Russon, 2004).

The formal properties of action and tool organization being noted here create a space for systematic change within a framework that promotes the accumulation of structure through time. For example, there are many different ways that the head, the striking surface of the ax, might be attached to its handle: pliable wood tightened with a leather thong as in Fig. 5, cords alone tying the stone to the handle, adhesives, etc. The task of joining the head to the handle creates a problem space for experimentation through systematic variation. However, this experimentation does not require that the complexity of the ax (or other action) be focused on as a complex whole. Instead the elements that are held constant, the handle and the stone head for example, or alternatively the handle and the haft if different kinds of hammers or blades are being experimented with, constitute a matrix that can remain stable while variations in a single part are tested. The formal arrangement of parts that constitutes the tool or ax remains in place, even as modification is occurring within that structure. Tools progressively differentiate within the accumulative stability provided by a core feature of human action, an organization that makes possible co-operative transformation zones. The same is true for language structure. Through visible repair a noun phrase such as ''my son'' can be transformed into ''my oldest son'' and thus publicly decomposed into differentiated sub-parts that permit optional insertion and deletion. These possibilities for decomposition and transformation are made visible to others with endogenous talk itself (Goodwin, 2006).

In Fig. 3 it was seen that Chil could build a single action by attaching his prosody to rich lexico-syntactic structure constructed by another. More generally utterances and turns at talk are built through the mutual co-operation of speakers who provide talk and hearers who operate on that that talk through visible, embodied displays. Equivalently, when tools are built by combining different kinds of parts, their collaborative social production by actors occupying alternative positions (designers in California and factory workers in China for example) becomes possible.

Though utterances and stone axes appear to be completely different kinds of phenomena, and are indeed analyzed by entirely different disciplines within the social sciences, as forms of human social action they have important patterns of formal organization in common. Each is built by combining different kinds of materials. This makes possible distinctive forms of collaborative social organization built through co-operative action as participants occupying structurally different positions, such as speaker and hearer, or trading partners, contribute different parts to the combinatorial arrangement required to build a single utterance, turn at talk, tool, or object. These utterances and/or objects thus constitute the nexus for extended, enduring webs of social relationships, and sites for accumulative change.

7. Building epistemically competent actors through co-operative action

To build action co-operatively participants must know and understand each other, and the activities they are pursuing together, in ways that make possible the further development of those activities. Distributions of knowledge are not only built into the basic structure of many forms of human action, but change in ways that are consequential as action unfolds (Goodwin, 1979, 1980; Heritage, 2012). Forms of knowing within the organization of human action are thus organized as a dynamic ecology. As noted above in the discussion of the Munsell chart, this ecology includes the historical sedimentation of ways of knowing developed by predecessors. This shapes both how diverse communities know the world that is the focus of their action in very different ways, and the types of action that can be performed, as new ways of action (e.g., classifying color through use of a Munsell chart) emerge.

The ability to create through practice the meaningful actions and objects that animate work, knowledge and discourse within specific communities requires that one be a competent member of that community. The co-operative transformation zone where the Munsell chart is used as a component of professional practice is not only the place where the dirt being excavated is transformed into archaeological data. It is also the site where participation in the activity helps transform new students into skilled, competent archaeologists (Mogk and Goodwin, 2012) who have mastered the infrastructure of skilled practice, the habitus (Bourdieu, 1977), required to build the signature actions that constitute the work of their community. Social learning, or more narrowly pedagogy, is as unique a human adaptation as language and the use of compound tools (Cisbra and Gergely, 2011). With very few, very limited exceptions other animals do not explicitly teach their young. However, human communities are faced with the ongoing task of creating new competent members.

7.1. Calibrating professional vision

Apprenticeship through co-operative calibration provides resources for organizing as social practice not only the actions being built by the participants, but also skilled actors who can be trusted to see, categorize and operate upon the world in the ways required to carry out the actions that define the work of their communities. Fig. 6 provides one example.[11]

[11] See Goodwin (2010c) for more detailed examination of this sequence.

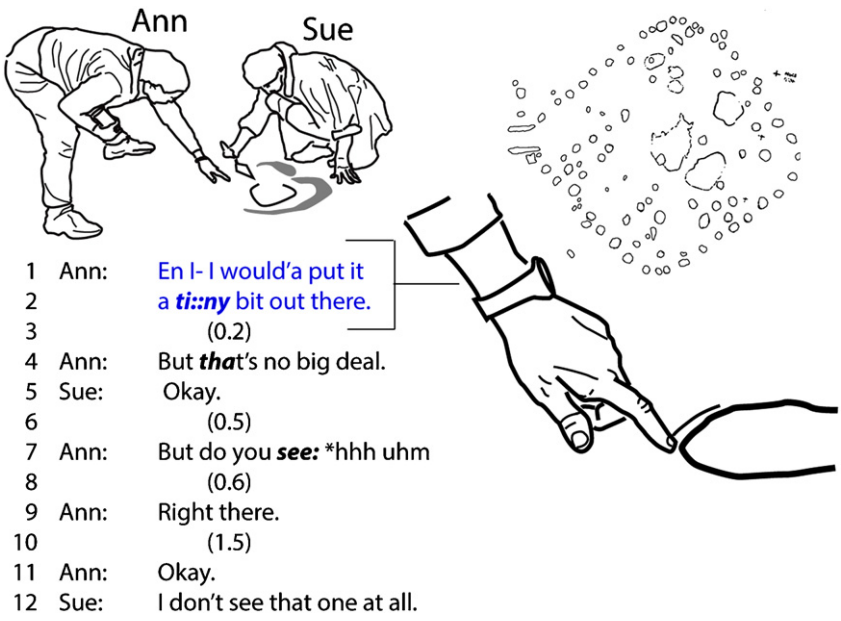

Fig. 6. Embodied calibration.

Sue, a young graduate student on one of her very first days doing archaeological excavation is outlining the contours of an ancient post mould, visible as subtle color differences in the dirt she is working with, so that its shape can be transferred to a map. She is doing this under the guidance of Ann, the senior archaeologist who is directing the field school. Sue uses her trowel to inscribe in the dirt where she sees the shape she is trying to outline. Ann then uses her finger to lightly draw a second line, just outside Sue's, while saying ''I would'a put it a ***ti::ny*** bit out there.'' This calibration of the exact shape to be transferred to the map is made possible because of the way in which Sue's line makes public the precise way in which she sees the feature she is working with. Her public inscription provides a substrate that Ann can operate on with her subsequent line, which is organized not as a new completely different action, but instead as an interpretant of Sue's. This process not only calibrates the actions and objects the participants are constructing: the line that accurately depicts the shape of the post mould. It is also helps calibrate, in rather fine detail, the skill and professional vision that must be mastered by a young archaeologist if others in her profession are to trust the work she does.

As described in more detail in Goodwin (2010c) Fig. 7 depicts in a simple fashion some of what is created by building mundane, consequential action within a local epistemic ecology. What emerges, through recursive processes of mutual

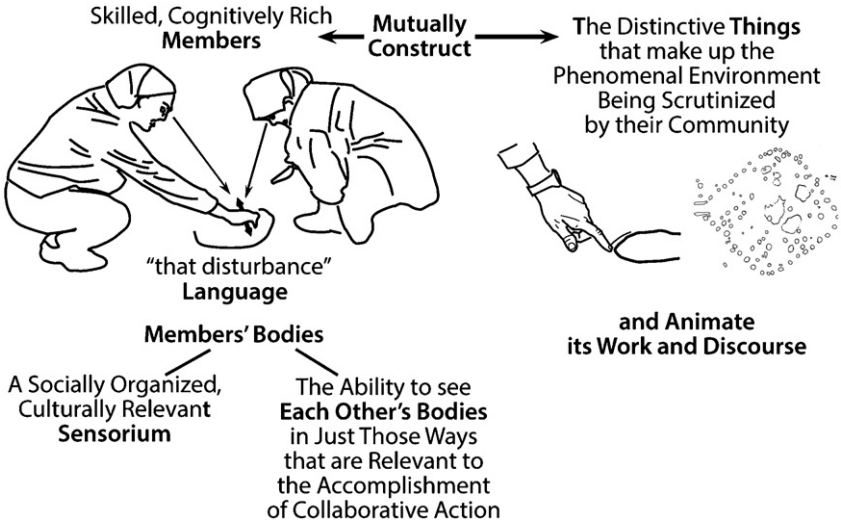

Fig. 7. The reciprocal constitution, through co-operative calibration, of things, actors and communities.

elaboration that link situated practice to many different kinds of semiotic phenomena, is the co-operative calibration of actors, practice, communities, and the intelligibility of a world being scrutinized. This is made possible by the way in which action is constructed through the entanglement of different kinds of resources which allow differentially positioned actors to participate simultaneously in the construction and calibration of action. Epistemic ecologies not only organize ways of knowing that are consequential for the distinctive activities of a community, and records, such as maps, of how the world is known and operated on in a relevant fashion by a particular community; they also provide, within the midst of mundane action itself the co-operative practices required to instantiate the community's epistemic ecology as situated practice within the skilled competence of new members. Acquisition of the practices required to construct a map simultaneously constructs the relevant cognitive architecture of the archaeologists who use such maps to do their work.

8. Conclusion

Actions exist as rich, temporally unfolding process. Individual actions emerge from, and use, a consequential past shaped through chains of prior action, providing current participants with a dense, present environment, a rich now, containing many different kinds of resources that can be selectively decomposed, reused and transformed to build a next action, a proposal for how the future will be organized. Thus human beings build action by combining diverse resources (e.g., language structure, categories, prosody, postural configurations, the embodied displays of a hearer, tools, etc.) to perform both simultaneous and sequential transformative operations on a local, public semiotic substrate brought into existence by processes on many different time scales (from the immediately prior utterance to the progressive sedimentation of structure in tools, languages and settings). To build action participants must know in detail what each other is doing, the kinds of knowledge each can accountably be expected to possess, and relevant features of the materials, whether language structure, artifacts or features of the setting, that contribute to the organization of the action in progress. The way in which a single action encompasses different kinds of resources makes possible 1) distinctive forms of social organization as alternatively positioned actors contribute different kinds of structure to a single shared action (e.g., the talk of a speaker and the silent visible displays of hearer work together to construct a turn-at-talk and the utterance emerging within it); and 2) the accumulation and differentiation through time within local co-operative transformation zones of dense substrates that create a multiplicity of settings for action. Each of these must be inhabited by competent members who have mastered the culturally specific practices required to perform the activities that animate the lifeworld of a particular community. Through the progressive development of, and apprenticeship within, diverse epistemic ecologies, communities invest their members with the resources required to understand each other in just the ways that make possible the accomplishment of ongoing, situated action.

Acknowledgements

I am very deeply indebted to Eton Churchill, Arnulf Deppermann, Cre Engelke, Candy Goodwin, Anthony Graesch, Timo Kaukomaa, Adam Kendon, Per Linell, Oskar Lindwall, Helen Melandar, Jeremy Kelly, Joe Manson, Numa Markee, Lorenza Mondada, Chase Raymond, Fritjof Sahlström, Monica Smith, Jürgen Streeck, Danjie Su, Akira Takada, Angela Tan, Daniela Veronesi and two anonymous reviewers for most insightful and helpful comments on an earlier version of this analysis. I owe a great debt to Gail Wagner, the students at the archaeological field school, Chil and his family, the children recorded by Candy Goodwin as they played on the street in Philadelphia, and the families who participated in the Sloan Funded Center on the Everyday Lives of Families organized by Elinor Ochs for allowing actual events in their lives to be recorded.

My debt to all those who have taken the time to make such insightful comments is deep and genuine. It is not just that I am responsible for the problems that remain, but rather that within the limits of this paper I cannot adequately explore the richness of what they have given me.

References

Agha, Asif, 2007. Language and Social Relations. Cambridge University Press, Cambridge.

Bakhtin, Mikhail, 1981., (C. Emerson, M. Holquist, Trans.) In: Holquist, M. (Ed.), The Dialogic Imagination: Four Essays. University of Texas Press, Austin.

Barth-Weingarften, Dagmar, Elisabeth, Reber, Margaret, Selting (Eds.), 2010. Constructing Meaning Through Prosody in Aphasia.. John Benjamins, Amsterdam.

Bourdieu, Pierre, 1977. Outline of a Theory of Practice., (Richard Nice, Trans.), Cambridge University Press, Cambridge.

Brasier, Martin D., Matthewman, Richard, McMahon, Sean, Wacey, David, 2011. Pumice as a remarkable substrate for the origin of life. Astrobiology 11 (7), 725–735.

Cisbra, Gergely, Gergely, György, 2011. Natural pedagogy as evolutionary adaptation. Philosophical Transactions of the Royal Society B 366, 1149–1157.

Du Bois, John W., forthcoming. Towards a dialogic syntax. Cognitive Linguistics. (Special issue on Dialogic Resonance, edited by Rachel Giora and John W. Du Bois).
Enfield, Nick J., 2009. The Anatomy of Meaning: Speech, Gesture and Composite Utterances. Cambridge University Press, Cambridge.
Enfield, Nick J., Levinson, Stephen C. (Eds.), 2006. Roots of Human Sociality. Berg Press, London.
Fitch, W. Tecumseh., 2010. The Evolution of Language. Cambridge University Press, Cambridge.
Goffman, Erving, 1981. Footing. In: Goffman, Erving (Ed.), Forms of Talk. University of Pennsylvania Press, Philadelphia, pp. 124–159.
Goodwin, Charles, 1979. The interactive construction of a sentence in natural conversation. In: Psathas, George (Ed.), Everyday Language: Studies in Ethnomethodology. Irvington Publishers, New York, pp. 97–121.
Goodwin, Marjorie Harness, 1980. Processes of mutual monitoring implicated in the production of description sequences. Sociological Inquiry 50, 303–317.
Goodwin, Charles, 1981. Conversational Organization: Interaction Between Speakers and Hearers. Academic Press, New York.
Goodwin, Marjorie Harness, 1983. Aggravated correction and disagreement in children's conversations. Journal of Pragmatics 7, 657–677.
Goodwin, Charles, 1984. Notes on story structure and the organization of participation. In: Atkinson, Max, Heritage, John (Eds.), Structures of Social Action. Cambridge University Press, Cambridge, pp. 225–246.
Goodwin, Charles, 1994. Professional vision. American Anthropologist 96 (3), 606–633.
Goodwin, Charles, 1995. Seeing in depth. Social Studies of Science 25, 237–274.
Goodwin, Charles, 2000. Action and embodiment within situated human interaction. Journal of Pragmatics 32, 1489–1522.
Goodwin, Charles, 2006. Human sociality as mutual orientation in a rich interactive environment: multimodal utterances and pointing in aphasia. In: Enfield, Nick, Levinson, C. Stephen (Eds.), Roots of human sociality. Berg Press, London, pp. 96–125.
Goodwin, Charles, 2007a. Environmentally coupled gestures. In: Duncan, Susan, Cassell, Justine, Levy, Elena (Eds.), Gesture and the Dynamic Dimension of Language. John Benjamins, Amsterdam/Philadelphia, pp. 195–212.
Goodwin, Charles, 2007b. Interactive footing. In: Holt, Elizabeth, Clift, Rebecca (Eds.), Reporting Talk: Reported Speech in Interaction. Cambridge University Press, Cambridge, pp. 16–46.
Goodwin, Charles, 2010a. Building action in public environments with diverse semiotic resources. Versus 112–113 (Special Issue ''The External Mind: Perspectives on Semiosis, Distribution and Situation in Cognition'' edited by Roccardo Fusaroli, Tommaso Granelli and Claudio Paolucci), 165–178.
Goodwin, Charles, 2010b. Constructing meaning through prosody in aphasia. In: Barth-Weingarten, Dagmar, Reber, Elisabeth, Selting, Margaret (Eds.), Prosody in Interaction. John Benjamins, Amsterdam, pp. 373–394.
Goodwin, Charles, 2010c. Things and their embodied environments. In: Malafouris, Lambros, Renfrew, Colin (Eds.), The Cognitive Life of Things: Recasting the Boundaries of the Mind. McDonald Institute Monographs (David Brown Book Co.), Cambridge, pp. 103–120.
Goodwin, Charles, 2011. Contextures of action. In: Streeck, Jürgen, Goodwin, Charles, Lebaron, Curtis D. (Eds.), Embodied Interaction: Language and Body in the Material World. Cambridge University Press, Cambridge, pp. 182–193.
Goodwin, Charles, Goodwin, Marjorie Harness, 1987a. Concurrent operations on talk: notes on the interactive organization of assessments. IPrA Papers in Pragmatics 1 (No. 1), 1–52.
Goodwin, Marjorie Harness, Goodwin, Charles, 1987b. Children's arguing. In: Philips, Susan, Steele, Susan, Tanz, Christine (Eds.), Language, Gender, and Sex in Comparative Perspective. Cambridge University Press, Cambridge, pp. 200–248.
Goodwin, Charles, Goodwin, Marjorie Harness, 1992. Context, activity and participation. In: Auer, Peter, di Luzio, Aldo (Eds.), The Contextualization of Language. Benjamins, Amsterdam, pp. 77–99.
Heath, Christian, Hindmarsh, Jon, Luff, Paul, 2010. Video in Qualitative Research: Analysing Social Interaction in Everyday Life. Sage, Los Angeles.
Heritage, John, 2012. Epistemics in action; action formation and territories of knowledge. Research on Language and Social Interaction 45 (1), 1–29.
Hindmarsh, Jon, Pilnick, Alison, 2007. Knowing bodies at work: embodiment and ephemeral teamwork in anaesthesia. Organization Studies 28 (9), 1395–1416.
Husserl, Edmund, 1936. The Crisis of the European Sciences and Transcendal Phenomenology; An Introduction to Phenomenological Philosophy., (Translated, with an introduction by David Carr), Northwestern University Press, Evanston.
Hutchins, Edwin, 1995. Cognition in the Wild. MIT Press, Cambridge, MA.
Ingold, Tim, 2007. Lines: A Brief History. Routledge, Oxford.
Ingold, Tim, 2011. Being Alive: Essays on Movement, Knowledge and Description. Routledge, New York.
Iwasaki, Shimako, 2011. The multimodal mechanics of collaborative unit construction in Japanese conversation. In: Streeck, Jurgen, Goodwin, Charles, LeBaron, Curt (Eds.), Embodied Interaction: Language and the Body in the Material World. Cambridge University Press, Cambridge, pp. 106–120.
Kaukomaa, Timo, Peräkylä, Anssi, Ruusuvuori, Johanna, in press. Turn-Opening Smiles: Facial Expression Constructing Emotional Transition in Conversation. Journal of Pragmatics.
Kendon, Adam, 2009. Language's Matrix. Gesture 9, 355–372.
Knorr-Cetina, Karin, 1999. Epistemic Cultures: How the Sciences Make Knowledge. Harvard University Press.
Latour, Bruno, Woolgar, Steve, 1979. Laboratory Life: The Social Construction of Scientific Facts. Sage, London.
Levinson, Stephen, 2012. Action formation and ascription. In: Sidnell, Jack, Stivers, Tanya (Eds.), The Handbook of Conversation Analysis. Blackwell, West Sussex, UK, pp. 103–130.
Linell, Per, 2009. Rethinking Language, Mind, and World Dialogically: Interactional and Contextual Theories of Human Sense-Making. Information Age Publishing, Charlotte, NC.
Mogk, David W., Goodwin, Charles, 2012. Learning in the field: synthesis of research on thinking & learning in the geosciences. In: Kastens, Kim, Manduca, Cathryn (Eds.), Earth and Mind Ii: A Synthesis of Research on Thinking & Learning in the Geosciences. The Geological Society of America, Boulder, CO, pp. 131–163.
Mondada, Lorenza, 2009. Emergent focused interactions in public places: a systematic analysis of the multimodal achievement of a common interactional space. Journal of Pragmatics 41, 1977–1997.

Reynolds, Peter C., 1993. The complementary theory of language and tool use. In: Gibson, P.C., Ingold, Tim (Eds.), Tools, Language and Cognition in Human Evolution. Cambridge University Press, Cambridge, pp. 407–428.

Russon, Anne E., 2004. Orangutans: Wizards of the Rain Forest. Firefly Books, Buffalo, NY.

Sacks, Harvey, 1995. Lectures on Conversation I. Blackwell, Cambridge, MA.

Sacks, Harvey, Schegloff, Emanuel A., Jefferson, Gail, 1974. A simplest systematics for the organization of turn-taking for conversation. Language 50, 696–735.

Schegloff, Emanuel A., Sacks, Harvey, 1973. Opening up closings. Semiotica 8, 289–327.

Schegloff, Emanuel A., Jefferson, Gail, Sacks, Harvey, 1977. The preference for self-correction in the organization of repair in conversation. Language 53, 361–382.

Streeck, Jürgen, Goooodwin, Charles, LeBaron, Curtis (Eds.), 2011. Embodied Interaction: Language and the Body in the Material World. Cambridge University Press, Cambridge.

Wittgenstein, Ludwig, 1958., (G.E.M. Anscombe, Trans.) In: Anscombe, G.E.M., Rhees, R. (Eds.), Philosophical Investigations. 2nd edition. Blackwell, Oxford.