Favareau, D. (in press). Collapsing the wave function of meaning. In: *A Legacy of Living Systems: Gregory Bateson as a Precursor to Biosemiotics*. Jesper Hoffmeyer (Ed.) Berlin: Springer-Verlag.

Collapsing The Wave Function Of Meaning: The Epistemological Matrix of Talk-in-Interaction

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Abstract

Devoted to an explication of how interacting agents mutually and micro-temporally provide for each other the grounds for immediate next action in the seemingly transparent give-and-take of ordinary conversation, empirical findings from the disciplines of Interaction Analysis suggest that "language" as it is actually realized in naturally occurring, everyday talk-in-interaction, may derive its semiotic efficacy more from the active co-participation of situated speakers in creating contexts of relevancy, constraint and possibility for each other's immediate next re-shaping of the cybernetic surround than it does from the computational recombination of referential tokens within the bounds of some predetermined, category-structuring syntax.

The twin purposes of this article are to: (1) to serve as an introduction to some of the basic principles, methodologies and research data of Interaction Analysis, and (2) to attempt to situate such research and its findings within the broader study of meaning-making among living agents that is the goal of a Gregory Bateson-inspired *biosemiotics*. Here I hope to show how the former can well illuminate latter's efforts to explicate the principles whereby not only our human social worlds – but our very biological world itself – comes into being not as a "pre-given" in the furniture of the universe, but as a locally organized, massively co-constructed, participant-fashioned *accomplishment* in that universe instead.

Introduction: No Mere Words

Communication between individuals, cybernetic system theory, and the ecology of causality interlinking human society with the natural world constitute the three main axes around which Gregory Bateson's innovative thought and work revolved. Refusing to settle for simplistic explanations of what he intuited was a highly complex, massively interdependent world, Bateson examined a wide variety of systemic interaction in his efforts to discover the orderly relations defining alcoholism, schizophrenia, bilateral symmetry, dolphin communication, international policy, biological evolution and learning – to name just a few of his many investigations into what he called, famously, "the pattern that connects" them all (1979:8).

In so doing, Gregory Bateson distinguished himself as an intellectual of a more classical disposition than that of many of his contemporaries, as he was not content to limit those investigations simply to what can be gleaned from the results of academic field work and scientific laboratory data. Rather, Bateson also sought to bring into the "data set" of the natural world that he was seeking to explicate the evidentiary canons of human literature, art, mythology and philosophy, as well as – if not even more fundamentally – the ubiquitous mechanics of the ordinary and the everyday: that vast realm of "seen but unnoticed" phenomena that form our own most immediate *ecology of mind.*

For like Wittgenstein at least in this sense, Bateson understood that one of the hardest tasks of both the scientist and the philosopher is the cultivation of an ability to see "what lies in front of everybody's eyes" – that which by its very never-absent ubiquity makes it extraordinarily difficult for us to consciously conceptualize and articulate (Wittgenstein 1953:§129; 1984:63e). Indeed, learning to "see through your eyes, not with them" was an

admonition of William Blake's that Bateson was much fond of quoting. It is not surprising then that much of Bateson's writing concerns itself with trying to bring to light such *systemic relations* out of which the experiential "patterns" of subjectivity themselves emerge.

Consider, for example, the following Batesonian "metalogue":

> D: No, Daddy, it doesn't make sense. I don't smile now so as to be able to tell you I am angry by not smiling later on.
> F: Yes – I think that *is* part of the reason for smiling.
> […]
> F: Anyway, it's all nonsense. I mean the notion that language is made of words is nonsense…And all the syntax and the grammar and the rest of it is nonsense. It's all based on the idea that "mere" words exist – and there are none.
> […]
> D: Would it be a good thing if people gave up words and went back to only gestures?
> F: Hmmm. I don't know. …But it might be fun – it would make life a sort of ballet – with dancers making their own music.
>
> (Gregory Bateson, *"Why do Frenchmen?"* 1951/2000:11;13)[1]

Here, as in so many other places in Gregory Bateson's work – the reader follows Bateson's wide-ranging intellect and curiosity as it alights for a moment on some suggestive pattern of sign-meaning-and-consequence in interaction that Bateson apparently feels worthy of one of these suggestive little dialogues, but then does not himself systematically follow up on as a fully-fledged research project – instead leaving its later explication as a "thread" for other researchers to pick up on, should they wish, so as to see where it might lead.

And indeed, thirty years later, we find empirical language researcher Charles Goodwin reporting that:

> [In observing the micro-regularities that participants can be shown to be attending to in the seamless back and forth of talk], an analogy which readily comes to mind is the music that trapeze artists use to coordinate their separate actions. However, in conversation, the "signal" used to synchronize the action of the participants, the stream of speech, is *itself* a product of their coordinated action – much as if the music in the circus was not a preformulated melody, but rather an emergent product of the coordinated actions of the performers, and simultaneously a resource employed to achieve that very coordination.
>
> (Charles Goodwin 1981:28)

Yet it is significant for more than just the discipline of "language study" that the thread that Gregory Bateson dropped about the nature of language in 1951 (and that Goodwin and his colleagues would independently pick up on several decades later) laid unfollowed for almost thirty years. For six years after Bateson's observation about the paucity of the "mere words" hypothesis, the publication of Noam Chomsky's withering critique of B.F. Skinner's (equally anti-Batesonian) behaviorism as an approach to language study in 1957 altered the direction of "language study" away from the locus of interacting individuals, and placed it

[1] When referencing the most recent (2000) re-issue of Gregory Bateson's seminal collection of essays, *Steps to an Ecology of Mind*, I will always include the original publication date of the particular essay cited, as here.

squarely within the province of the genetically determined alleyways of the "individual brain." It was at this point that

> … sociology left the study of "language" to linguistics. … [There,] Saussure's focus on the study of language as an autonomous formal system to be investigated in isolation from other social processes …set the agenda for modern Linguistics, and was in fact intensified by Chomsky [in] his programmatic argument [1965:3-4] that actual talk is so flawed and degenerate that the linguist interested in competence should ignore it. (M. H. Goodwin 1990:3)

Indeed, with the widespread acceptance of Chomsky's purely theoretical postulation of a "context free universal grammar" and Language Processing Module assumed to be hard-wired into every individual's brain at birth (1968:79, 1980:65, 241-245; *et passim*), his aptly titled "Cartesian Linguistics" approach became the default way of understanding and investigating human language structure for the next thirty years – having by now become so mainstream as to have become literally synonymous with the academic discipline of "Linguistics" itself.

Thus, in order to appreciate just how radically divergent the Platonic, top-down, mentalist Chomskian approach to language is from the interactive, ecological and autopoetic approach that Gregory Bateson was pointing to when he scoffed at the purported existence of "mere words," one has to first understand what the Chomskian linguists themselves feel that they are doing when they are analyzing language use. Afterwards, we will see what a more Batesonian approach to languaged interaction looks like.

Language as Newtonian "Natural Law"

Writing at a time before any researcher began systematically examining recorded instances of real-time language use (and long before subsequent brain imaging studies ruled out the existence of any such known dedicated "Language Acquisition Module" in the brain), Chomsky himself declared that "performed" actual language was a derivative and degenerate form of the unseen and Platonic construct of an underlying innate Universal Grammar:

> In the technical sense, *linguistic theory is mentalistic* [wrote Chomsky] since it is concerned with discovering a mental reality underlying actual behavior. *Observed use of language* or hypothesized dispositions to respond, habits, and so on may provide evidence as to the nature of this mental reality, but *surely cannot constitute the actual subject matter of linguistics*, if this is to be a serious discipline … [For] a record of natural speech will show numerous false starts, deviations from rules, changes of plan in mid-course, and so on. The problem for the linguist, as well as for the child learning the language, is to determine from the data of performance the underlying system of rules that has been mastered by the speaker-hearer and that he *puts to use in actual performance*. (Chomsky 1965:4, *italics* added)

The averred entailment of the Chomskian view of language is that what both the analyst and the child learning language must be attentive to in the actual performance of other language speakers are those elements of a posited Universal Grammar which would allow

them to recognize the underlying and causative Deep Structure rules, as evidenced in the representative Chomskian linguistic analysis below:

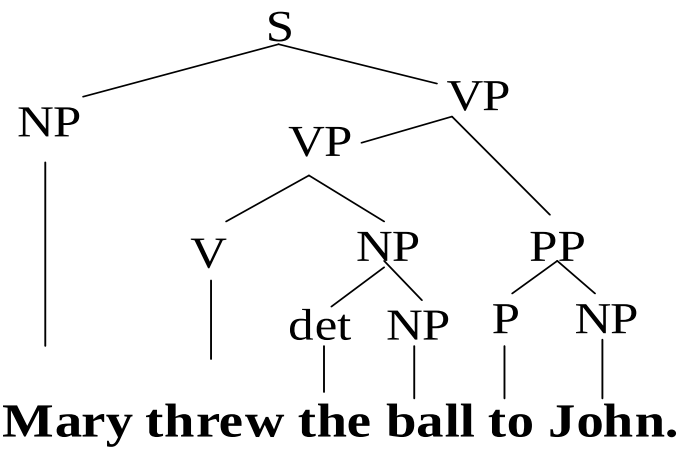

Figure 2
Chomskian analysis of an instance of language use

(Hierarchically, from top: S – Sentence, NP – Noun Phrase, VP – Verb Phrase, V – Verb, PP – Prepositional Phrase, Det – Determiner, P – Preposition)

What both the analyst and the child learning language are *not* supposed to be attending to, under this view of language structure, is the simultaneous presence of any *other* elements as routinely show up in human language use, such as those "perturbations and disfluencies" (*ibid*) that are marked by question marks in the diagram below.

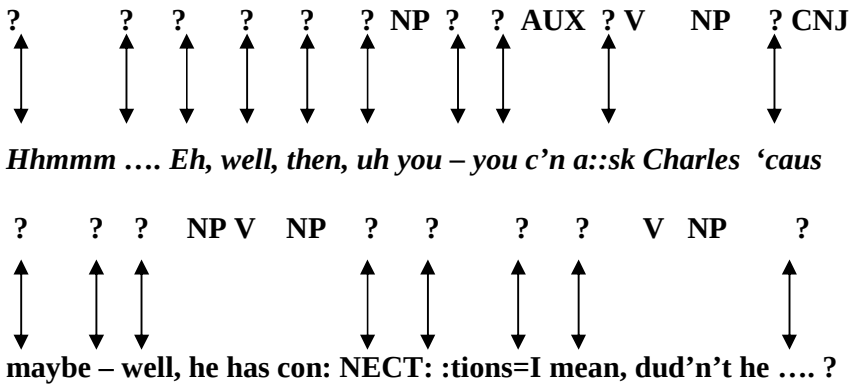

Figure 3
Transcribed section of naturally occurring talk (Favareau, in Iacoboni 2005)

Certainly, if one takes a Chomskian view of language – taking the artificially self-controlled style of *written* texts as one's fundamental example of what "language" consists in the first instance [2] – one might easily be led to see such a transcript of naturally occurring

[2] It is significant that the "data" of Chomskian linguistics consists in sets of *analyst-created sentences* such as the one diagrammed in Figure 1. Such "data" were originally presented to native speakers of a language to solicit their "native speaker intuitions" regarding which sentences were and were not "acceptable" in the target language (Chomsky 1965: 21). However, since such "native speaker intuitions" – thought to reflect the locally set parameters of the underlying Universal Grammar – were as reliably available to the native-speaking analyst

everyday talk as some kind of "flawed and degenerate" instance of language use. For in between all the supposedly meaning-carrying lexemes (Bateson's "mere words") is all this seemingly random *junk*. Thus, were one to attempt a Chomskian linguistic approach to analyzing such data, one would have to disregard a full 50% or more of what is actually occurring here as "performance errors." From that Platonic standard, it appears as if the speaker here is having trouble putting his or her words together so as to produce a grammatical utterance – despite the alleged innate ubiquity of a neurally instantiated module for the processing of Universal Grammar.

Yet is it at all reasonable to assume prior to empirical investigation that everything which is being discounted from a traditionally disciplinary linguistic analysis in the data depicted in Figure 3 – i.e, the very publicly shared volitional human events that outnumber the so-named grammatical language elements by a ratio of 2:1 – constitutes ungrammatical "performance errors" on the part of this language user? Or that such manifestly noticable sign tokens as: "you-you" "hmmm" and "…?" are not themselves deliberately deployed carriers of linguistic meaning that are attended to and acted upon as such by both speakers and hearers alike?

Doing so would be to assume *a priori* that the phenomena that is being so designed is "meaningless" in regard to the underlying "structure" of language – and, by extension, of "thought." Yet robust research findings now suggest that this approach may be analogous to the once equally misguided dismissal of what was formerly mischaracterized as "junk DNA." For the thirty-year project that I will be referring to in this paper under the umbrella term of Interaction Analysis offers compelling evidence for the claim that the precise placement of all these so-called "perturbations and disfluencies" – and the way that those placements are registered, recognized, and acted upon by their recipients – itself constitutes a "system of rules that has been mastered by the speaker-hearer and that he puts to use in actual performance" (Chomsky 1965:4).

Thus, it is to a brief overview if this research – Batesonian in both spirit and methodological rigor – that we now turn.

Boiling Clean the Data Set of Languaged Interaction

When one spends enough time examining the empirical evidence, the claims that "uh" and "eh" and "you – you can" are instances of language processing disfluency turn out to be surprisingly specious. Contrarily, in fact, it has been shown that such performances evidence a language processing *fluency* on a level of fine-grained resolution previously unrealized. Accordingly, we will return to an interactional analysis of the above episode of talk shortly. For now, however, the point that needs to taken by those readers who have never been xposed to anything other than the traditional view of language as primarily a grammatically sentential and propositional bearer of meaning is this:

The transcribed specimen pockmarked with question marks above represents not a *deviation* from the semiotic structure of linguistic interaction, but rather, an altogether typical example of interactionally *competent* real-time, meaning-making language use. For it has been verified overwhelmingly that almost all empirically collected specimens of naturally occurring language use exhibit a similar type of seeming "ungrammaticality," as exemplified below:

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as they were to the "experimental subjects," eventually the subjects were done away with entirely. Thus, it is not uncommon practice now for the Chomskian linguist – i.e., the very same person who creates the artificial "data set" to also provide the "native speaker intuition" about its "grammaticality" that determines the "result" of the so-called linguistic experiment.

> An's – an'( ) we were discussing, it tur- , it comes down, he s – he says, I – I – you've talked with thi – si – i – about this many times. *I* said, it came down t' this : = our main difference, *I* feel that a government, I – the main thing, is – th – the purpose of the government is, what is best for the country.
>
> *(Schegloff 1976)*

Dispelling the naïve assumption that such "disfluency" is a hallmark of only of informal, careless or otherwise un-educated talk, Ochs, Gonzales and Jacoby (1996) furnish ample representative data of scientific interaction as it occurs during the working deliberations of experimental physicists:

> M: Yeah not only that you – we did experiments where we (.) we uh
> M: (0.2) we (.) brought the system : uh : (0.8) here
> R: Mm hm
> M: And then we uhm (0.2) °or was it there?° (0.2) uh : that's right.
> M: Here. Then we lowered the field (0.2) raised the field.
>
> *(Ochs, Gonzales and Jacoby 1996)*

Scientific empiricism establishes this kind of language use is our *default* form in interaction, and one can scientifically replicate this investigation (and get to experience the attendant difficulties in transcending the overdetermination of the written form thereby) merely by recording ten to twenty minutes of one's own naturally occurring language interactions and then carefully transcribing *all* of the inarguably produced vocal sounds, pauses, re-starts and gestural displays with which meaning is being produced and received. It is an illuminating experience that, for the scientifically inclined, raises more questions than it answers.

Bit by bit, however, such answers have been forthcoming, as the findings from the thirty plus years of empirical research into the actual mechanics of language use reveal not only that this kind of communication between individuals *is* invariantly so, but that, semiotically speaking, it *must* be so – and that all of these elements that have been dismissed from analysis as "excrescences" and "disfluencies" are, in fact, structural *necessities* for the real-time making and taking of messages and of meaning during the course of face-to-face interaction.

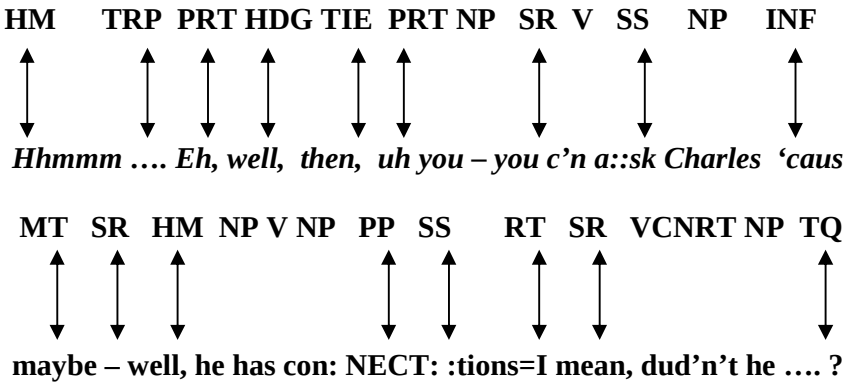

Figure 4

Partially complete designation of some major sign-vehicles for meaning-making in talk

(HM: Hesitation Marker, TRP: Transition Relevance Place, PRT: Perturbation, HDG: Hedge, TIE: Tie, SR: Self-Repair, SS: Sound Stretch, INF: Informal Register, MT: Mitigation Marker, ACCT: Account, PPK: Pitch Peak, RT: Rush Through, , TQ: Tag Question)

For as Figure 4 reveals, almost all of the "perturbations and disfluencies" that have been traditionally thrown out of the non-empirical "data" of linguistic analysis as meaningless noise, have been empirically proven since to carry recognizable, utilizable and consequential meaning for the interacting participants. Indeed, the result of studying such research findings reveals that to *not* attend to such deliberately deployed meaning-making resources as denoted above would render any prospective language speaker – much less any child trying to learn language – grossly incompetent in taking and making meaning within the society of other language users

Accordingly, a major difference between a Batesonian cybernetic approach and a determinist innatist approach to an complex interactive system such as language is the understanding that the analyst observing the system from the outside cannot *a-priori* be certain what within the operation of the system counts therein as "signal" and what as "noise." Only *observation of change in the system's internal configuration as it is working* can confirm such observer analysis – and, of course, in a system such as language, it is the subjects under study whose own real-time (and immediately consequential) analysis on the incoming data set of signs establishes the referential "meaning" of words, acts, sounds – and silence.

Thus, by unconsciously conflating the grammaticality conventions that are the cultural product of *written* language as the standard by which "language" *per se* should be understood and investigated (and then further postulating that such conventions reflect the structure of an innately biological "mentalese" [Pinker 1994:82]), the Chomskian notion of "language" as fundamentally a mental phenomenon that one translates into public action not only reverses language's historical and ontological precedence ("a sort of Orwellian rewriting of the evolutionary past in the terms of the present" as Terrence Deacon once remarked) [3], but leaves the would-be language analyst "blind for the significance"[4] of how "mere words" get their referential and relational powers to begin with.

A Cybernetic Modeling of Language as an "Ecology of Signs"

Such face-to-face real-time interaction between individuals *gives rise* to the communally developed sets of tools that Bateson calls "mere words" and the network of practice that allow those tools to function as symbols in the human "ecology of mind." Yet here, as in so many other investigations into the ubiquitous, taken-for-granted world, it took a certain kind of visionary to really "see" what is never not in front of everybody's eyes. One of the first such "seers" in this case was a man whose mind was very much, in fact, like that of Gregory Bateson – an independent and original thinker named Harvey Sacks (1935-1975).

A sociologist impatient with the "analyst-determined" categories imposed upon social life by the majority of that discipline's practitioners, Sacks wanted to use the empirical data of real, everyday talk and interaction – what Emmanuel Schegloff , Sack's collaborator and co-founder of the discipline of Conversation Analysis, refers to as "the primordial site of sociality"– to discover how structure and meaning-bearing pattern was put into the visible environment for use in real-time between agents.

A Batesonian, and indeed, an eminently *biosemiotic* undertaking both in spirit and in practice, Sacks and Schegloff's project was to found an empirically driven social science that

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[3] Deacon 1997:53.

[4] *Bedeutungsblind*, of course, being the term most famously used by proto-biosemiotician Jakob von Uexküll to decry the practice of letting the requirements of our technical model of some natural phenomenon circumscribe our ability to observe such phenomena, and not vice versa. (Rüting 2004:1).

sought to explicate the patterns of relations that the participants in social life themselves were attending to, interpreting and acting upon as they jointly co-construct the "mutual intelligibility" – of a shared social world. In this, Sacks and Schegloff were not looking to theorize about some set of "invisible power relations" that human beings had supposedly "internalized" – nor did they ascribe much value to the kind of "dormitive hypotheses" based on an assumption that that the individual agent is but a puppet either of their biology, or of their society, or of both.

Rather, eschewing the tradition wherein an underlying or "secret reality" invisible to the actual agents of interaction is made visible by the work of a more insightful analyst (a tradition that Sacks felt ran through far to much of sociological analysis and through the Western tradition generally, from Plato through to Marx and Freud and beyond) Sacks instead set himself the far more Batesonian challenge of trying to understand the "seen reality" of public experience – the coenoscopically falsifiable techniques and methods of "what it is that people seem to know and *use*" as they go about making sense of each other, themselves, and the world together (Sacks, in Heritage 1984:233).[5]

Like Bateson, Sacks realized that "mundane" real-time interaction between human beings constituted a kind of context-dependant and context-creating system – and that the "orderliness" and "regularity" of that system's mechanics are not properties that are pre-given or imposed on it from without, but are qualities that the system itself has to accomplish and maintain autopoetically.

And as Terrence Deacon illustrates masterfully in the diagram below, the real-time building and maintenance of such interactive and generative *system order* allows its users access to a knowledge-bearing set of relations that is the stably held, emergent product of the aggregate activity of the system users themselves, as each takes meaning from and contributes meaning to a historically evolving system of sign use embodied in both (analog) individual activity and in (digital) inscription and artifact.

[5] In this, Sacks and his colleagues were building – albeit in their own unique and scientifically systematic way – upon earlier work, such as the *verstehen* "social phenomenology" of Alfred Schutz (1899-1959), Erving Goffman's (1922-1982) micro-sociology of everyday life, and Harold Garfinkel's (b. 1917) "ethno-methodological" study of social practice. Subsequently, Sacks and Schegloff's own project of Conversation Analysis has since been extended to the micro-examination of the use of gesture, body position, and material artifacts in human face-to-face interaction (e.g., Kendon 1990, Streek 1996, Goodwin 2000). Thus, for the purposes of this paper, I will use the umbrella term Interaction Analysis to refer to all of the work on human interaction that proceeds from and incorporates the Sacks and Schegloff methodology.

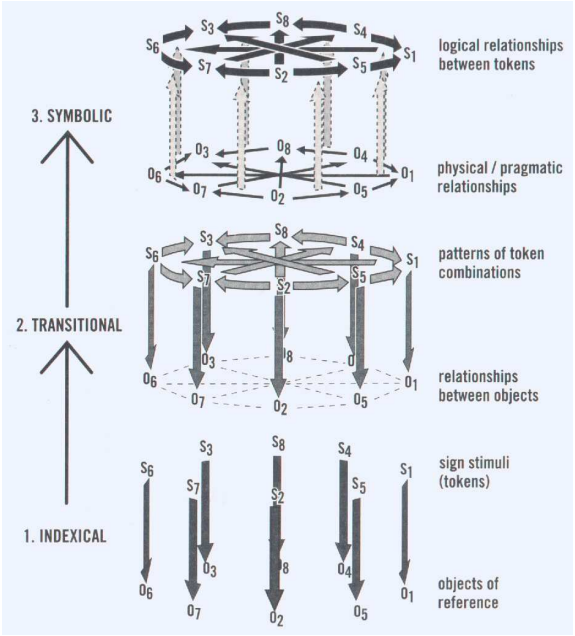


Figure 4:
Deacon's matrix of referential relations necessary for the accomplishment of symbolic reference *(Deacon 1997:79).*

Though the above diagram might first appear as a straightforward Peircean schematic of operations taking place "inside an individual mind," both Deacon and Peirce insist (as does Bateson) that such operations fundamentally derive their referential and semiotic power from a system of relations external to, though including, the individual agent. For again, as Gregory Bateson reminds us: "If we then say that a message has "meaning" or is "about" some referent, what we mean is that there is a larger universe of relevance consisting of message-plus-referent, and that redundancy or pattern or predictability is introduced into this universe by the message" (1967/2000:413).

Such redundancy of pattern is iconic at its lowest levels (Bateson's "difference that makes a difference"), associative (or indexical) in its mediation between regularly conjoined *sets* of such iconic "differences," and symbolic (or virtual) as the patterns – or more properly, the *relations* - being realized experientially are the "relations between relations" as these relations are recognized over and above their instantiation in "mere things." Accordingly, the experience of such interactively emergent "top-level" symbolic relations then comes to exert downwardly causal effects on the system reception (or "understanding") of the "lower-level" iconic and indexical relations from which the symbolic relations themselves originally issued, initiating a kind of self-supporting and generatively recursive matrix of meaning.

However: even this characteristically human, characteristically *languaged*, referential matrix yet still – like all instances of semiosis – requires a community laboratory of real-world cause-and-effect wherein even the most "virtual" semiotic posits can be tested for veracity and effectiveness – a public domain of interactively-constituted sign-exchange whereby purely "symbolic" meanings can be created, negotiated and, most importantly for human beings, co-operatively sustained.

Anthropologist Michael Tomasello (1999) makes this point succinctly when he notes that the ability to dialectically "ratchet" semiotic representations by off-loading them publicly into the very environment in which the community lives "is the crucial step in the ontogeny of human social cognition [that allows successive members of the community] to culturally mediate their understanding of the world through … the perspectives and

understandings … embodied in the material and symbolic artifacts created by other persons far removed in space and time" (1999: 92 -93).

Such an understanding changes the way one approaches a study of language (and languaged cognition) considerably. "Rather than being instantiated in autonomous cognitive structures, the crafting of meaning is intrinsically an interactive process, something that people do in collaboration with each other," writes Interaction Analyst Charles Goodwin, noting that the forty years worth of empirically collected, naturally occurring data of moment-by-moment human interaction "support the argument that the really difficult, and crucial, issues in cognition involve not the problem of abstraction but just the reverse: the work of building the particulars of concrete events in locally relevant contexts" (2002:11).

Rather than a depiction of the calculus of private experience, then, Deacon's matrix depicts a real-world, knowledge-bearing system of sign relations that human beings enter (or more properly, are ushered into), learn to master, continuously navigate, and perpetually sustain and build. And, indeed, it is exactly the micro-mechanics of this publicly available, cyberneticly interactive, complex, adaptive *system* of sign use that I want to focus on in this article. For – just as Bateson discovered when he examined the popular notion of the "autonomous" individual or mind (e.g., 1969/200:490; 1971/200:319; 1972/2000:339; *et passim*) – the popular notion of this meaning-bearing system of real-world agent-object interactions also has a tendency towards idealization, reification, reduction and misleading causal autonomy.

Fighting this trend and set upon discovering the everyday, coenoscopic principles by which sign users themselves develop and maintain a generative real-time *system order*, Sacks and his collaborators broke with a long standing tradition in sociology – and in Western inquiry more generally – by attempting to determine empirically what the relevant units of analysis of this phenomenon are not for the linguistic or sociological "analyst" – but *for the participants of sign exchange* themselves as they go about analyzing and acting upon each other's publicly displayed activity in the joint construction of information and meaning.

What I will attempt to do in the remainder of this article is to provide the reader unacquainted with such research just the most summary overview of the findings of the first thirty-plus years of Interaction Analysis – whose empirically collected corpus of video- and audio-taped naturally occurring data shows the moment-to-moment practices of semiotic agents attending and orienting to signs for action opportunities (and not just for "propositional content") and symbiotically creating, out of the patterns emerging out of such interaction, the very structures upon which subsequent interaction may be created and contained, in a real-time unfolding "ecology of mind." [6]

Fundaments of System Order: The Contingent Responsivity of Turn-Taking

A naturalist collecting empirical evidence of interaction between members of the same species in their natural habitat recorded the following few seconds worth of transcribed data, said data being absolutely typical of said species' moment-to-moment interactions. The

[6] Given the impossibility of summarizing almost forty years of research in the space of a journal article, only most broad-brush examples and analysis will be presented here, as a way of introducing the relevant congruence of Interaction Analysis to Batesonians and biosemioticians. A more detailed discussion of this same congruence is available in Favareau 2004, and more in-depth overviews of the history of Interaction and Conversation Analysis are available Heritage 1984 ; Ochs, Schegloff and Thompson 1996; Levinson 1983 and Prevignano and Thibault 2003, noting – most importantly – the primary source material cited therein.

species activity that the members are collaboratively engaged in here has been named "shopping" and the environment in which the activity is taking place is understood by all of them to be "a clothing store."

Ana: How's that?
Ben: Uh…
Ceil: Perfect!
Ben: Mmmm
All: ……..
Ceil: You don't think so?
Ben: [splays hands]
Ana: Too seventies?
Ben: For my tastes.
Ceil: *Tsk!*
Ben: Still…
Ana: Something plainer.
Ben: [nods head]
Ceil: *God!*

(author data 'Marui')

In the data transcribed above, three autonomously acting individuals are each co-ordinating their actions towards one another simultaneously, without any overt direction regarding who is to talk at what point or for how long. Yet, here we find that no one individual's speech overlapping on the top of any another; that there is no breakdown in the turn-taking choreography, despite the obvious absence of a pre-given order, or of centralized control; and that there exists no overt disputation over who should be speaking and who should be remaining silent at any given point along the rapidly unfolding stretch of instantly created interaction. Rather, the split-second back-and-forth choreography of the talk is actively being managed from within, with the actions of each speaker/hearer (for all participants, of course, must shift constantly back and forth between roles) at all times being reflexively contingent upon the immediately-just actualized decisions of all the others.

Careful examination of this data – and of all the data that will follow – moreover, shows that it cannot be the completion of grammatical sentences on the part of each individual speaker that accounts for the micro-coordination of speaking opportunities that allows this altogether typical spate of ordinary interaction to run off as a fast-paced, three-way juggling act – as the far majority of utterances are not actual grammatically complete sentences, and many are not even words:

Ana:	How's that?	SENTENCE
Ben:	Uh…	SOUND
Ceil:	Perfect!	WORD
Ben:	Mmmm	HUMMING
All:		SILENCE
Ceil:	You don't think so?	SENTENCE
Ben:	[splays hands]	GESTURE
Ana:	Too seventies?	ADJECTIVAL PHRASE
Ben:	For my tastes.	CLAUSE
Ceil:	*Tsk!*	TONGUE CLICK
Ben:	Still…	WORD
Ana:	Something plainer.	NOUN PHRASE

Ben:	[nods head]	GESTURE
Ceil:	*God!*	WORD

Notice that in the majority of cases above, these "minimal units of meaning" most certainly are not the S → NP + VP constructions of the Chomskian "Universal" Grammatical sentences. Rather, what we see here as being *understood by the participants* as relevant and "meaningful" are grammatically incomplete phrases, clauses, single lexical items, throat-clearing, laughter, pauses, tongue-clicking "uh", "mmm" "tsk," body gestures and, perhaps tellingly, quiescence – because, of course, at the conclusion of utterance 4, any of the three participants could have chosen to speak – and all chose not to.

Now, it should be acknowledged at the outset investing even this much energy in describing something so mundane and insignificant may strike most conventionally-minded people as somewhat ludicrous or absurd.

And so in fact it might be, if it weren't for the fact that in order for such kinds of interaction actually *happen at all* in the way that the thirty years worth of empirical evidence reveals repeatedly that it does, the *participants themselves* have to be attending to at least this multiply layered cascade of transiently appearing and disappearing events and opportunities within the split-second unfolding of every instance of communicative interaction.

And indeed, four decades of sustained, empirical research investigating the online co-construction of talk reveals that so fine-grained is the kind of mutual synchrony that underlies the locally managed turn-taking of conversational talk-in-interaction, that the micro-beat between the time that one person stops talking and another begins has been found to be well under two-tenths of a second.

Ana: **(< 0.1)** How's that?
Ben: **(< 0.1)** Uh…
Ceil: **(< 0.1)** Perfect!
Ben: **(< 0.1)** Mmmm
All: **(2.3)**
Ceil: **(< 0.1)** You don't think so?
Ben: **(< 0.1)** [splays hands]
Ana: **(< 0.1)** Too seventies?
Ben: **(< 0.1)** For my tastes.
Ceil: **(< 0.1)** *Tsk!*
Ben: **(< 0.1)** Still…
Ana: **(< 0.1)** Something plainer.
Ben: **(< 0.1)** [nods head]
Ceil: **(< 0.1)** *God!*

Silences in excess of this 0.2 second beat as it occurs in this "transition space" thus become *audible* as salient events in their own rights to participants in interaction, and become incorporated as further resources for the communal making and the taking of meaning. For as Interaction Analyst John Heritage notes – and as we shall have more opportunity to examine and discuss in-depth later – "when the *'relevant next'* is provided, it is treated as requiring no special explanation…but when the relevanced next does not occur, the move becomes specifically accountable" (Heritage 1984:247, 253), as evidenced below:

A: Is there something bothering you or not?
(1.0)
A: Yes or no?

(1.5)
A: Eh?
B: **(<0.1)** No.

(Atkinson and Drew 1979:52)

So robust is the consequential normativity of such "relevant absences," in fact, that they are evident as meaning-carriers even to young children:

A: We have to cut these Mummy.
(1.3)
A: Won't we Mummy?
(1.5)
A: Won't we?
B: **(<0.2)** Yes.

(Atkinson and Drew 1979:52)

For just as Bateson reminds us in regard to neural function: "Quiescence differs as much from activity as activity differs from quiescence. Therefore both quiescence and activity have equal informational relevance. The message of activity can only be accepted as valid if the message of quiescence can also be trusted" (1972:319)

Accordingly, the intricately and bi-directionally choreographed motor activity *across* agents constitutes the basic conversational turn-taking system. This is enabled in part by participants' monitoring the stream of each other's ongoing speech, tracking it for the appearance of some fairly invariant "affordances" – i.e., transiently appearing opportunities for action, as in Gibson' s (1950) sense – which are not exclusively grammatical, but rhythmic, pitch contour-intonational and body postural as well.

Transiently Emergent Order: Transition Relevance Points

1	Deb:	Can you wait till we get home? We'll be home in five minutes.
2	Anne:	Even less than that.
3	Naomi:	But could we – could I stay up?
		(0.2)
4	Naomi:	Once we get home.
5	Marty:	For a few minutes.
6	Deb:	Once you get your nightgown on.

(Schegloff, Jefferson and Sacks 1977: 366)

A: Somebody said looking at m [*:y, son – my oldest son
B: ((_____gaze_____)[*gaze breaks](____gaze___))

(Goodwin 1981:130)

Overwhelmingly, the data collected over the course of the last thirty years on naturally occurring communicative interaction demonstrates that participants track the trajectory of each other's stream of speech, body postures, and orientations in the shared semiotic surround for what interactional analysts refer to as, variously Transition Relevant Places (TRPs) or Possible Completion Points (PCPs).

Such "places" in the stream of talk are *not* synonymous with grammatical sentence completion points, nor are they deterministic signals for the transition of speakers to take place. Rather, they are intonationally, interactionally and grammatically "possibly complete" points that are understood by participants-in-interaction as *sanctioned and probabilistic opportunity spaces* for another speaker to begin. For a hearer who is tracking the unfolding

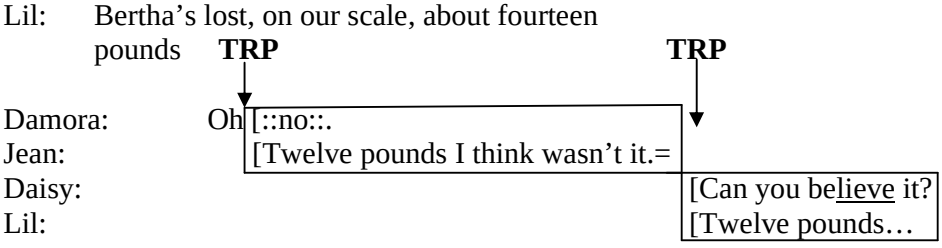
event of speech in real time cannot possibly distinguish "possibly complete" from "complete" utterances, save in retrospect – for unlike with the written word, speech never comes to us complete and ad hoc, but piecemeal and in real time. (Covering this line of text with your hand and pulling your hand rightwards to reveal the text letter by letter and word for word is the closest approximation to real time language processing that the present medium will afford). Below, then, is a schematic example of such intonational and possibly grammatically complete opportunity spaces as they present themselves through the moment-to-moment unfolding of everyday talk:

Accordingly, here is how an actual participant in interaction responded to such talk:

(Jefferson 1984:17)

Note that participant B does not come in "just anywhere" during the course of A's unfolding stream of speech. She does not, for instance, come in during the course of the construction of the verb phrase "there must be" or after the projectives "some" or "into the" – rather, the overlap that happens here (signified by the parallel open brackets) occurs, as studies prove robustly happens, at an interactionally sanctioned Transition Relevance Place.

Moreover, so attuned are interactional participants to the transiently appearing and disappearing opportunities of such Transition Relevance Places [TRPs] that it is not uncommon for participants to recognize the same TRP at the same time, and to "overlap" each other's talk in the simultaneous attempt to actualize the opportunity presented there.



(Sacks, Schegloff and Jefferson 1974: 707)

Working with a large collection of such materials, Jefferson (1984) finds that such "overlap" is overwhelmingly "not a matter of 'people just not listening to each other' but quite the contrary … a matter of fine grained attention" to the action opportunities continually opening up for them – and just as continually, closing down on them – during the production of each other's turns-at-talk (Jefferson 1984:11).

Such simultaneous onset is far from random, and again points to the fact that the ongoing production and reception of talk is *not* accomplished in the way that a pre-completed text or utterance is "read" or "heard." Rather, talk is "developing" in real-time and participants, like tennis players, must somehow contrive to position themselves everywhere at once in order to successfully accomplish the seamless back-and-forth of semiotic interaction (cf. Iacoboni 2005 for a brief analysis of the motoric neuro-physiology underpinning everyday talk).

Desk: What is your last name [Loraine?
Caller: [Dinnis.
Desk: What?
Caller: Dinnis.

(Sacks, Schegloff and Jefferson 1974: 702)

Ken: I saw 'em last night [at uhm school.
Jim: [They're a riot.

(Sacks, Schegloff and Jefferson 1974:. 721)

Louise: I think it's really funny [to watch.
Roger: [Ohhh God!

(Sacks, Schegloff and Jefferson 1974: 721)

Writes Jefferson:

> I want to stress about [these] and other such 'transition place' overlaps that at the point of overlap onset, the recipient/now-starting-next-speaker is doing something perfectly proper, perfectly within his rights and obligations as a recipient/next speaker. He is *not* doing what we commonly understand to be 'interrupting' – roughly, starting up 'in the midst of' another's turn at talk, not letting the other finish.' On the other hand, the current speaker is *also* doing something perfectly proper. He is producing a single turn at talk which happens to have multiple components in it [some of which, unavoidably, are TRPs]. (Jefferson 1984:16)

Often compared with the experientially familiar "sidewalk dance" that pedestrians engage in as each recognizes the *same* immediately available open space and simultaneously moves into it (often blocking each other anew with every mutually recognized opportunity taken), overlap onset is recognized by participants to interaction as introducing "trouble" in the smooth flow of choreography that all participants are necessarily invested in attempting to accomplish and maintain.

Thus, there are a number of interactional resources that participants can and do employ to negotiate "out" of such interactional bottlenecks. And although we will not be reviewing those resources here,[7] suffice it for our purposes to observe that, overwhelmingly, participants are able to successfully negotiate these simultaneous onsets quickly and transparently, without breaking the back-and-forth of conversation by introducing overt discussion into the talk regarding who should proceed and who should "drop out" when the simultaneous onset of turn-taking occurs.

R: We'll be home way before then.
R: [And I…]

[7] Interested readers should see particularly Sacks, Schegloff and Jefferson 1974, Goodwin 1979 1980 1981, Jefferson 1984, Goodwin and Goodwin 1987 1992, Lerner 1996, and Schegloff 1980 1982 1988 1992 and 2000 for satisfactorily detailed discussions of such resources.

B: [So could…]
R: Sorry.
B: No, go ahead.
R: No, no, what were you going to say?
B: Well I was wondering if…

(author data BR:Car)

For our purposes now, the important point to register is that these TRPs are mutually recognized *as such* not only by those hearers who are waiting to come in, but also by those speakers who – recognizing the contingent possibility that they are providing in these spaces – deploy a number of potentially "pre-emptive" and counteracting" resources to attempt to secure the turn and to circumvent their hearers from coming in at just these mutually available points. Such resources include speeding up the rhythm of the ongoing utterance at just these points ("rush-throughs"), elongating a Possible Completion Point *through* the TRP ("sound stretches") and the insertion of the familiar – seemingly gratuitous but strategically efficacious – resources such as "but, then" "and ya'know what?" "see," and "like..." [8]

Indeed, recognizing a TRP *as* a TRP is itself an on-line, real-time interactively instantiated accomplishment – which leads us two points needing at least cursory addressing here. The first is that the Interaction Analysis (IA) method of inquiry is not, unlike traditional linguistics (or even "text semiotics"), an analysis of how hypothetical agents engage with a physically pre-completed message or text. Rather, the meaning-making going on here takes place piecemeal, bit by bit, in real time and is *interactionally collaborative* through and through – neither speaker nor hearer is assured of the emerging content of a message in any way but *a posteriori.*[9]

Second is that the onus of analysis in Interaction Analysis defers always to the *displayed* understandings of the participants themselves as the empirical warrant for determining what any given bit of interaction "means." As in biosemiotics, signs are only "signs" because the agent in a sign relation (not the analyst observing that relation) *acts* upon them as being so.

Thus, by studying the moment-to-moment unfolding of semiotic interaction, we find that in the organization of conversational interaction – just as in organization of ecosystems, social species and symbiotic organisms, the signs that participants are both putting into the shared public surround and attending to for the mutual accomplishment of action are not in

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[8] Here, too, even a summary discussion of such resources is beyond the space allotted here. But excellent accounts can be found in Schegloff, Jefferson and Sacks 1977, C. Goodwin 1995b 2002, Schegloff 1986 1991 1995b, Heritage 1984, Goodwin and Goodwin 1987, Jefferson 1987, and Ford, Fox and Thompson 2002.

[9] Some of the more obvious examples of which include the everyday phenomenon called "collaborative completion", where the "authorship" of a given utterance is literally distributed, as evidenced below:

David: So if one person said he couldn't invest (.)=
Kerry: =then I'd have to wait.

R: And if you don't put things on your calendar (.)=
D: =you're out of luck.

Louise: When he gets his eyes like this and he starts thinking, you know=
Ken: =then you get to worry.

(all from Lerner 1991:445)

Moreover, Goodwin (1986, 1995, 2000a, 2000b, 2000c) has collected a corpus of evidence that establishes decisively that *listeners'* moment-to-moment gestures, body torque, eye movements and even breathing can be and often are causally influential factors in how a spate-of-talk "in progress" will alter it's very content, as well as its form.

the first instance propositional or conceptual ideas to psychologically operate with, but indexical and iconic signs to operate interactionally on.

Stepping into the Immediate Next: Adjacency Pair Interaction

In discussing the emergence of physical order, complexity theorist Stuart Kauffman (1995:22) refers to the "adjacent possible" as that set of all of the possible "next" reactions that have just "become possible" by the actualization of, for example, the present molecular state. Out of this variously delimited set, only one such possibility is actualized at the expense of all the others, and this single actualized possibility becomes the substrate upon which the next set of as yet unactualized possibilities are made immediately available.

In rigidly deterministic systems, the set of possibilities made available by any given actualization is small. As such reactions become embedded in systems and as these systems themselves complexify and become recursively embedded, however, the degrees of freedom opened up by any given actualization increase exponentially, while at the same time systemic pressure biasing the directionality of such actualizations begins to exert a shaping or canalizing effect of the kinds that can be seen both phylogenetically and in embryogenesis, and in post-natal neurogenesis and epigenesis in general.

In talk-in-interaction, too, the notion of the "adjacent possible" plays a critical role in the self-organization of order, as may be evident even from the short examination of the turn-taking phenomena presented above. I stated earlier, however, that this public structure that participants are creating for each other is not just a "substrate" upon which pre-formulated, "already meaning-bearing messages" are *exchanged*, but is instead the primary epistemological *resource* out of which real time meaning is *created*.

This understanding – that one really does *not* know in advance exactly what one's utterance (much less entire spate of talk) is going to be, even at the outset of producing it, but that one is actually building one's utterances as one goes along, in moment-to-moment reaction to, and consideration of, the semiotic constraints and possibilities that are opening up and closing down in each immediately actualizing "adjacency" moment – is common to everyday experience upon a few moments reflection, but lost utterly to an over-formalized theory of language (and thought) as computation and as an exchange of messages that are first fully pre-formulated in the brain, translated into words, delivered into the public environment via "the minimal meaning-bearing units" of *sentences*, decoded in full as such, and then replied to in a reciprocal manner. [10]

Thus, the competing IA and Chomskian understanding of how "language" works really do reflect profoundly opposite understandings of how "minds" work. The Chomskian speaker is an autonomous actor with regards to his environment, but genetically highly determined from within. Language, like Mind, is a property of individuals in the first instance (and ultimately a physical property, no less). The IA speaker, conversely, is interactively constituted through and through (and knows this if the IA speaker is also a biosemiotician!) For while the agent himself is a physical entity, both Language and Mind are system properties emerging from the interactive relations of groups of individuals (and with the sets of naturally occurring relations) of which the physical agent is a part.

"The elementary cybernetic system with its *messages in circuit* is, in fact, the simplest unit of *mind*" Bateson reminds us, and the transform of *a difference traveling in a circuit* is the elementary *idea*" (1970/2000:465, italics mine). Let us keep in mind, then, Bateson's insistence that "mind" is not co-extensive with "individual consciousness" and that "the 'self' is a false reification of an improperly delimited part of a much larger field of interacting

[10] Cf. Chomsky's programmatic equation of language as a "set of sentences" (1957:13-15).

processes" (2000:331 [as well as: 242, 319, 466, 490, 492, *et passim*) as we continue to consider the Batesonian (and biosemiotic) implications suggested by the empirical research findings of Interaction Analysis.

Canonically, the term "adjacency pair" is used to refer to those sequences of talk that have the following features: these sequences are (1) two utterances in length, with (2) different speakers producing each utterance. Furthermore, they are: (3) *ordered* (ie – not interchangeable) as "first pair parts" (FPP) and "second pair parts" (SPP) and (4) *typed*, such that certain first pair parts *make relevant* a range of certain, but by no means any and all, kinds of second pair parts. (Schegloff and Sacks 1973: 295).

Such a broad-brush definition, as will immediately become apparent, requires more meticulous articulation at every point. The paired parts need not be verbal utterances, for example, as is made striking evident in Goodwin's work on aphasia (1995 2000b 2000c 2002), and the "immediately next" adjacency positioning may be interstitially expanded through the insertion of intervening adjacency pairs, as we shall see below. Yet as a first-pass description of the kinds of meaning-bearing structures that agents collaboratively bring into existence – and then subsequently orient to and *use* in order to understand one another – such description and these canonical examples at least reflect a flavor of what it is that the participants themselves are seeing "as such."

Perhaps the robust ubiquity of participants' orientation to the collaborative completion of adjacency pairs is best illustrated by examining how adjacency pairs can be inserted within adjacency pairs to constitute the meaning-bearing actions that interaction analysts call *insertion sequences.* A well-cited example of this everyday phenomenon appears in the second set of data specimens below:

Consecutive Adjacency Pair Sequence:

A:	What time is it now?	FPP 1: QUESTION
B:	Uh, seven o'clock.	SPP 1: ANSWER
C:	We'll all meet in Hawaii and celebrate Christmas.	FPP 2: ANNOUNCEMENT
D:	Good. I like that idea.	SPP 2: ASSESSMENT
E:	Come quickly!	FPP 3: COMMAND
F:	No way.	SPP 3: REFUSAL

(Morita 2005:41;43)

Adjacency Pair Sequence Inserted Within an Adjacency Pair Sequence:

A:	May I have a bottle of Mich?	FPP 1: QUESTION 1
B:	Are you twenty-one?	FPP 2: QUESTION 2
A:	No.	SPP 2: ANSWER 2
B:	No.	SPP 1: ANSWER 1

(*Merritt 1976: 333)*

Moreover, the fact that participants to interaction can and do leave an adjacency pair "open" – though not forgotten and, in fact, very much "in play" – while they negotiate the details relevant to its closing, can be seen in the following example wherein no less than eighty-one turns are passed back and forth before the FPP initiating the discussion receives its relevant SPP.

B:	**hhh. n I was wondering if you'd let me borrow your gun**	**REQ 1**	**FPP A**
	(1.2)		
J:	My gun?	Q1	FPP 1
B:	Yeah.	A1	SPP 1
	(1.0)		
J:	*What* gun?	Q2	FPP 2
	(0.7)		
B:	Don't you have a BB gun?	Q3	FPP 3
J::	Yeah.	A3	SPP 3
	(0.8)		
B:	(I'm a) It'[s		
J::	[I have a lotta guns. Hehh	A3	INCR
B:	You do?	Q4	FPP 4

Incredibly, it is not until 81 turns after B's initial and as yet uncompleted First Pair Part receives its Second Pair Part, as marked in bold below.

J:	You a good – (.) uh::: (1.8) <u>a</u>ctress?	Q*n*1	FPP
	(1.0)		
B:	No. heheheheh.	A*n*1	SPP
	(0.5)		
J:	Then how'd you come out to be Annie?	Q*n*2	FPP
	(1.0)		
B:	no – I'm – it's just that – everybody in the class	A*n*2	SPP
	Has to do a different pantomime, you know?	Q*n*3	FPP
J:	Uh-huh.	A*n*3	SPP
	(0.4)		
B:	An:::		
J:	**Yeah; you can use it.**	**REQ 1**	**SPP A**

(Schegloff 1990:56)

The critical point to attend to in examining such "minutiae" is this: The very ubiquity of our *own* heretofore unexamined use of (and reliance on) such interactively achieved and meaning-secreting structures as the adjacency-pair system blinds us to the significance that "answering" and "question" or "assessing" an "announcement" are *not* physically deterministic "reflexes" that simply *have* to be done.

Rather, in each and every instance they are *voluntary* actions deliberately undertaken and absolutely freely chosen. No physical forces or causation are determining, nor physical sanctions of punishment for non-compliance impending (most of the time) that would make "natural" the split-second supplying of a very particular type of Second Pair Part to the enregistered existence of a First Pair Part in the shared sensory surround.

Participation in this meaning-making circuit is voluntary and in no way rules out, in principle, supplying as a Second Pair Part to the First Pair Part question, "What time is it now?" a handshake, a whistle, a non-sequitur, a tap dance, or to handing your interlocutor a shoe. In fact, it is the almost infinite number of possible responses to any given linguistic interaction that virtually *never* get made (save by lunatics, and even much of their behavior falls within strictly delimited interactional order) that alerts us to just how profoundly attentive we are aligning our own actions (and understandings) within the virtual, non-physically causal system properties of *normative interactional order*.

As in complex-adaptive (and autopoetic) systems generally, such order emerges, over time, from the bottom-up interactions of face-to-face human interaction and results (Deaconian matrix-style) in upper-level system properties that then exert downwardly organizational order – as can be seen most clearly in instances of historical language change, as well in the popular ("ontogenetic') creation and incorporation of neologism (eg, Silverstein 2003). There is even a built-in mechanism for self-correction in the system (Bateson's ultimate criterion in the constitution of a true "mental system" (1969/2000:490) as we shall see) – but the point to be stressed here is that human beings both create and must act so as to *continually sustain* this interactional order on a level of fine-grained resolution unimagined before the painstaking second-to-second analysis of audio- and video- taped everyday interaction by Interaction Analysts (again, as we shall see).

And while Interaction Analysis is resolutely committed to *no* overarching theoretical commitments, seeing itself as purely an empirical science, I want to argue in this paper that the findings of thirty-plus years of IA research support the Batesonian (and biosemiotic) understanding that the reason human individuals put in all the moment-to-moment work of *maintaining* this "system order" is that public signs-in-interaction (including, but not limited to, the primordial site of sociality that is human-to-human talk) constitute a knowledge-bearing system that individuals must *partake of* for the realization (or construction) of their individual-specific experience of "mind."

Thus, in considering the robustness with which participants to interaction create, orient to and use "adjacency *meaning*" as a resource for organization and interaction, Duranti and Goodwin note that "a defining characteristic of true sequences is the property of *conditional relevance*: a first action creates a slot for an appropriate next action such that even the absence of that action can be perceived as a relevant and noticeable event" (Duranti and Goodwin 1992:191-192).

We saw examples of such "silences made hearable" due to their positioning earlier in this discussion. The example below shows that not only do the *recipients* of an utterance orient to the normativity of adjacency positioning as a resource for deriving meaning, but that the *speakers* of an utterance must do so simultaneously, as well.

A: They have a good cook there?
(1.7)
A: Nothing special?
B: No…

(Pomerantz 1984:76)

Knowing, then, that even silence is hearable as a meaning-bearing message, participants to talk-in-interaction therefore have an *intrinsic motivation* to distinguish and, if need be, explicitly identify for each other what any given silence is meant to be "doing" in the talk.

A: Do you really want to go there with me?
(2.5)
A: You don't, do you?
B: (<0.1) I'm thinking.

(author data, IKEA2)

So deeply entwined in each other's productions (as we saw when we examined the phenomenon of "collaborative completion"), and so intrinsically motivated to participate in the ongoing, moment-to-moment co-construction of meaning wherein their own positions will be defined with or without their own explicit agreement, participants to interaction co-

construct a *necessarily participatory world* wherein: "adjacent positioning [is] found to be the major means by which individual speakers could be assured of exerting some local influence over the conduct of their co-interactants" (Heritage 1984:265).

For as Schegloff (1995) reminds us:

> "First" and "second" do not refer merely to the order in which these turns *happen* to occur; they refer to design features of these turn types and sequential positions. The very feature of "first-ness" sets up the relevance of something else to follow: it projects the relevance of a "second." (Schegloff 1995b:10).

In Peircean terms, the *iconicity* of an FPP taken *as* an iconic sign as such, *indexicalizes* (here: "makes relevant") the provision of an SPP from the set of possibilities just actualized – and the *system* of interactions that emerges as the historical *result* of actualities so chosen ("conventional understanding," or the culture of *symbolic reference*) comes to downwardly shape and bias subsequent decisions for choosing amongst such sets. In this way, the participants to real-time semiotic interaction – by their very participation in the system – create and traverse an intelligible and literally *knowledge-producing* pathway through what at first seems like the dizzying tangle of Deacon's matrix of lived, embodied sign relations in Figure 4.

Place as Meaning: The Stigmergy and Structure of Sequence Organization

In our discussion above, we saw that the general principle of "the adjacent possible" wherein the directionality of development takes place, but is not mechanistically determined, is – in talk-and-interaction just as in microbial organization, animal interaction, and in embryogenesis – provided by the actions of the agents in a system which both emerges from those actions and recursively embeds them.

So too, then, does the principle of "the adjacent possible" that underlies the semiotic efficacy of Adjacency Pairs, make possible the semiotic efficacy of sequences that are "adjacent to Adjacency Pairs" as a resource for meaning-making and interaction, as the following examples of "pre-" adjacency pair structures reveals:

B:	Would you do me a favor? Heheh.	PRE-REQUEST
J:	Ehh depends on the favor:::=	HEDGE
J:	=Go ahead.	GO AHEAD
		(Schegloff 1990:56)

C:	Say, what are you doing?	PRE-INVITATION
R:	Well we're going out. Why?	BLOCK
		(Atkinson and Drew 1979:143)

Bee:	So you gonna be around this weekend?	PRE-INVITATION
Ava:	Uh:::m. (0.3) *Po*ssibly.	HEDGE
		(Schegloff 1995:24)

J:	Uhm. (0.?) Can I ask you something?	PRE-QUESTION
M:	Yeah.	GO AHEAD
J:	What has happened to Standard Prudential?	QUESTION
		(Schegloff 1980: 133)

This tight connection between sequence opportunity and meaning is why many "pre-" sequences of all kinds are deployed: for if a projected action is to be rejected, one can preclude the explicit realization of such rejection "in advance" – as would have been the case in our third example, had the SPP to the pre-request "Are there any aspirins around here?" been "No." So robust, in fact, is the participatory anticipation to "pre" moves among agents that such "pre's" can effectively function "in lieu" of requests – and can be granted or denied accordingly – as in the following sequence, where *no explicit request ever actually manifests* – but is nonetheless made relevant and acted upon as such:

A: We told Kathy that we'll help her move on Saturday. It's gonna be a lot of work.
B: Saturday I have baseball practice.

(author data, KH)

These everyday examples suggest something critically important about how we create, organize and use *meaning* (as opposed to mere denotational "reference") during conversational sign-exchange. For the forward-pointing relational property of "pre-ness" is always one that is understood as signifying that " something was done not as an action/move in its own right and analyzable in its own terms alone, but for its relevance to and bearing on some action/utterance projected to occur." (Schegloff 1995b: 20).

Here we find signs taken not straightforwardly as signs of what they iconically or indexically denote (e.g. the common "Do you know what time it is?" is not taken as a yes/no question about one's knowledge), but as signs pointing away from themselves, even *as* signs, to interpretations and understandings that have only become conventional-ized (read: become *symbolic*) through their *use* in an entire network of interlocking signs, agents, and interpretants.[11]

And here we see why it would be a mistake to conclude from such investigation that these agents are busily "processing propositional information" back and forth like so many packet switches in a computer motherboard. Rather, the meaning-making that the agents here are constructing together is visible, hearable and in a real sense "out there" in the world between them. For it is also out there in this embodied interface that the participants themselves constitute that they must be actively aligning their own breathing, body torque, facial expressions and motor rhythms in order to bring off the kind of fine-grained reflexivity of temporal and motor coordination that allow them to *collectively accomplish* the built order of apparently "seamless" transitioning and structural stigmergy that is the hallmark of everyday talk. [12]

Such stigmergy is of a piece with the understanding of *natural constructivism* that I have argued for elsewhere (Favareau 2001, 2004; Schumann, Favareau, *et al.* 2006), and that makes scientifically sensible the statement that: "Subjective experience is an organizing principle in nature." For in attending to the moment-to-moment, ever unfolding cycle of

[11] And this, of course, is why computerized "language processing" programs fail so miserably at taking "inference." Such non-literal, non-binary interpretation is a higher-order *system* relation that "is not vested in any individual sign-object pairing" and that actually requires the suppression of such indexical associations as termini, in favor of a higher-order interpretative logic that is situated (at least partly) outside of the interpreting agent itself (Deacon 1997:93).

[12] Noting that, again, there are even more semiotically relevant phenomena that may be co-present *simultaneously* during the course of interaction -- and that participants must recognize, use and be attentive to in order to successfully make meaning with each other – than are to be found merely in the stream of sound or even in the actions of the other participants themselves (cf. Goodwin and Goodwin 1987, Goodwin 1995b 1997 2000a 2002a 2003 Streek 1996 Schegloff 1998 Latour 1993 1999, Latour and Woolgar 1979).

perception, action, consequence that is (recursively) the life-world of all organisms, we see this exact same type of locally constructivist self-organization taking place in the building and inhabiting of eco-systems; in the actions undertaken in interaction between animals; and (with the appropriate allowances made for the use of the word "perception") on the level of the individual cell as it functions within a systemic whole. Figure 5, below, illustrates one of the less complex examples of just such context-dependant and context-creating semiotic agent interaction out of which issues the "order" of the natural world.

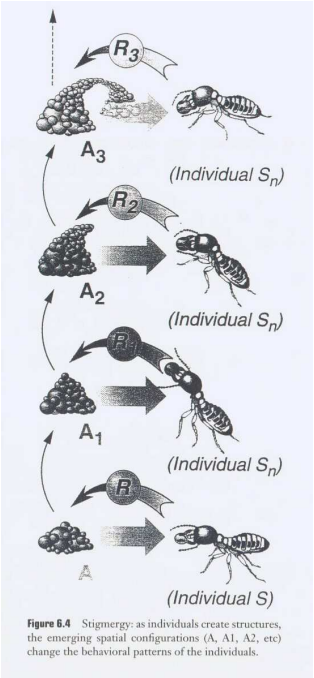

Figure 5

"Stigmergy: As individuals create structures, the emerging spatial configurations (A, A1, A2, etc.) change the behavioral patterns of the individuals" (Solé and Goodwin 2000:153)[13]

Here, just as in the generative contingency-and-consequence of real-time talk in interaction, we see agentive individuals orienting to, acting upon, and entering into the shared public surround of signs for the mutual accomplishment of action – and in so doing, symbiotically creating, out of the patterns emerging out of such interaction, the very structures upon which even more such communally life-sustaining organization and interaction may be realized, modified and maintained. In human conversational interaction, no less than in the built configuration of snowflakes or proteins whose "open ends" make *available* the realization of some possibilities while effectively eliminating the possibility of some others, the historically shaped product of each actually realized interaction serves as the substrate constraining and making possible (though not mechanistically determining) the next.

Thus the point of analyzing interaction this way is to detail the micro-precise ways in which the participants *themselves* are experiencing and creating interaction *as it comes to them* piece by piece, in real-time – and here it remains semiotically incomplete at every point until some such action is made by those immediately situated participants that changes the ever-developing growth of its trajectory. For talk-and-interaction, like all of biosemiotics, is

[13] The term "stigmergy" first appears in the works of biologist Pierre-Paul Grassé (1959). "Formed from the Greek words *stigma*, "sign", and *ergon*, "action" [it] captures the notion that an agent's actions leave signs in the environment – signs that it and other agents sense and that determine their subsequent actions" (Therauluz 1998:3) – a concept central to the heart of both Interaction Analysis and Biosemiotics.

grounded in the ever-present moment of "what to do right now, given this?" – a fundamentally *experiential* "question" that whose "answer" likewise is the immediate next *action* that is responsible for the subsequent unfolding of events that is the "history" of life on earth.

Understood as such, we see that the forward movement of conversational interaction is enabled not by the encoding and decoding of unambiguous "signal information" but by the active negotiation of co-acting participants *making* both meaning *and* structure out of the plenum of next action possibilities. Emergent and downwardly causal *order* is coming into existence here and is being defined for *use* by the actions of the participants at every bifurcation point – with such structure becoming itself the substrate for even more complex and recursive meaning *and* order.

The following interaction, for example, might seem to us extraordinarily pedestrian until we begin to "chart out" the kind of moment-to-moment meaning-making and order-making that the participants themselves are bringing into existence solely by their real-time exchange of semiotically constructivist acts:

R: Why don't we all have lunch? (A)
C: Okay (B), so, that would be in St. Jude's would it? (C)
R: Yes. (D)
(0.7)
C: Okay so::: (D)
R: One o'clock in the bar. (D)
C: Okay (D)
R: Okay? (E)
C: Okay (E) then thanks very much George= (F)
R: =All right. (G)
C: [See you there. (H)
R: [See you there. (H)
C: Okay (H)
R: Okay (H) [bye (I)
C: [Bye. (I)

Figure 6
Schematic diagram of a typical "closing" sequence
(data from Levinson 1983: 316-317)

KEY: (A) Closing Implicative Topic Offered (B) Closing Implicative Topic Accepted, (C) Closing Implicative Topic Initiated, (D) Closing Implicative Topic Negotiated, (E) Closing Implicative Topic Closed, (F) Pre-Close Offered, (G) Pre-Close Accepted , (H) Closing Passing Turns, (I) Close.

Mutually recognizable and collaboratively co-constructed sequences are being built within sequences here, with the superordinate sequences themselves the relata for yet higher-order sequences of actions getting done and communication taking place in the world. And while space considerations prevent us from examining the construction of such sequences in depth, suffice it to say that the empirical data of Interaction Analysis reveals participants rigorously creating and attending to fine-grained and mutually coordinated sequences for opening and closing conversations, for securing enough multi-unit turn space in advance in order to launch a storytelling sequence, for following such a storytelling sequence with a "second story" sequence of one's own, for exiting story-telling cycles entirely so as to move on to something else, for negotiating assessments, for giving and for receiving various kinds

of information, news and announcements, and for negotiating literally as many different contingencies as arise in communicative interaction itself. [14]

Because such practices have become ubiquitous to the point of invisibility, however, the major point that we want to emphasize here is that *all* of these everyday, seemingly effortless and transparent acts have to be *individually enacted* and *mutually accomplished* between agents. The everyday closing down of a telephone conversation, for instance, is not something that naturally "just happens" by itself, but is *each time* an individually negotiated agreement that requires a good deal of fine-grained, semiotically constructivist *work.* The diagram above sketches out just *some* of the on-line organization being created and attended to in "ending" or "closing down" an altogether unexceptional conversation. And while all this: "OK?" "OK." "OK." "See you." "See you." "OK." ….might seem unnecessarily redundant and peculiar to just this particular example, tape-recorded empirical evidence of your next experience in just this precise situation will prove to be remarkably the same.[15]

Such "redundancy" – like so much of everything else we find when we look at "language" in its natural habitat – is doing not so much "propositional" work as it is doing *semiotic* and *interactional* work. Thus, if "propositions" (and the ability to create and to understand them) are the evolutionary product of semiosis and interaction – as maintained by Bateson (1966/200:367) and by biosemiotics (Hoffmeyer 1996:112) – then the research findings of IA can tell us much about how these more fundamental relations still literally shape our cognition today.

"Repair" and the Participatory Maintenance of System Order

That the participants are orienting to the developing structure of their conversation as we have been noting is made evident by their behavior (indeed, such actual response behavior is the only acceptable analytic warrant in IA). However, it is obvious that no such "labels" as the kind that we have glossed the talk with above are available to participants to real-time, spontaneously self-organizing talk-and-interaction. Thus, the accomplishment of displaying to each other what the currently ongoing moves themselves "count as" instances of is also one that has to be interactionally negotiated, as we see in the data below:

(1) Mom: Do you know who's going to that meeting?
(2) Kid: Who?
(3) Mom: I don't know!
(4) Kid: Ou::h probably Mr. Murphy and Dad said probably Mrs. Timpte…

(Teraski 1976:45)

Here, at least two potential "breakdowns" in the meaning-bearing system order take place, are noticed, and corrected by the participants in this less than 4 second interval of interaction. In the first, K takes M's "question" in Line 1 as a "pre-announcement" and therefore supplies the preferred relevant next, a "go-ahead" in Line 2. In the second, M, in turn, takes K's "go-ahead" in Line 2 as a "question" and provides the preferred relevant next of an "answer" – as opposed to continuing on with her "announcement" as would have been relevant next if, indeed, Line 1 was intended as a "pre-announcement" and not as a straightforward "question."

[14] Reviewing even a significant portion of such literature is impossible here, and readers are directed, as always, to the sources referred to in the in-text citations for satisfactorily full accounts.

[15] Schegloff (1986), for example, examined a corpus of over 450 telephone call "openings" finding remarkable adherence to a conventional eight-turn opening sequence that proves robust across the Dutch, Egyptian and American instances of telephone conversations studied.

This very misalignment (or technically: the conflict between two equally reasonable but mutually exclusive alignments) in the system order has the effect of: (1) localizing the "trouble" that has arisen in the last few second's talk, (2) providing resources for the defining the nature of that trouble, and (3) providing K the resources to re-frame the proceeding talk and thus "repair" the trouble by (4) "re-setting" the interactional framework to a straightforward "question/answer" sequence, accomplished mutually by the participants in Line 4.

By examining this altogether ordinary episode of interaction, we can begin to appreciate how the naturally emergent system of talk-and-interaction makes publicly available the means by which its participants can and do validate and invalidate each other's "understandings" of what is happening at the current moment – without the matters of "who meant what and who misunderstood what when and who now re-understands what and why" being explicitly spoken of by the participants.[16]

Rather, because "the action template aspect of adjacency pair organization has a vitally significant *interpretative* corollary …[in that] however the recipient analyses the first speaker's utterance and whatever the conclusion of such an analysis, *some analysis, understanding or appreciation of the prior turn ill be displayed in the recipient's next turn* at talk … the interpretations embedded in these treatments of the prior turn are publicly available as the means by which previous speakers can determine how they were understood" (Heritage 1984:254-255).

Thus, instead of merely being a *propositional* "error-correcting" mechanism, interactional "repair" is used by participants to meaning-making interaction as a resource whereby the question of "what constitutes the semiotic order *per se"* at any given moment is abducted, accessed, and creatively engaged with by each individual agent. As such, it is the inescapably available "reality check" against which both public and private understandings must live or die, succeed or fail in a network of relations that includes, but far exceeds the individual system-using agent – i.e., in the public domain of interactively-constituted sign-exchange whereby meanings are created, negotiated and, most importantly for human beings, co-operatively sustained.

Inter-subjectivity and the Co-Creation of a "Known in Common" World

The "problem of intersubjectivity" has a long history in the literatures of philosophy and psychology, where it is usually posited as a cognitive "ability" inside of an agent that allows the agent to empathize with, and to imaginatively "stand in the place of" another individual (cf. Wisdom, 1952, Baron-Cohen 1993, Gallese and Goldman 1996). An understanding of human beings' communal reliance on publicly available, knowledge-bearing sign system of their own creation, however, offers a less mysterious explanation of how it is that reality may be experienced "inter-subject-ively" (literally: "between experiencers" – or here, between individual users of the one same mutually created semiotic system).

Following the example of proto-ethnomethodologist Alfred Schutz (1899-1959), however, Interaction Analysts likewise eschew the attempt to reify "inter-subjectivity" as an

[16] The accomplishment of such "transparency" is, of course, a design feature of repair itself. "In conversational order," wrote Goffman (1963:34), "the problem is to employ a sanction which will not destroy by its mere enactment the order which it is designed to maintain." Overt negotiation specifying each element of conversational trouble explicitly would similarly serve to derail episodes of current talk-and-interaction into nothing but talk *about* the current episode of talk-and-interaction itself. Thus we never hear the phrases "You owe me the second half of my adjacency pair" or "Please return to me your eye-gaze" though we see, continually, plenty of such interactive *work* done on the part of the participants to accomplish just these specific goals.

"autonomous mental capacity" emerging from and residing *within* a Cartesian mind, seeking instead to – like the everyday world of subjects they are studying – treat its situated and real-time "*achievement* and *maintenance* as a practical 'problem' which is routinely 'solved' by social actors in the course of their dealings with one another" (Heritage 1984:54).

Certainly, innocuous exchanges like the following:

A: Why did I turn out this way?
B: You mean homosexual?
A: Yeah.

(Schegloff, Sacks and Jefferson 1977:373)

C: But **w**as I actin stupid w[ith them?
D: [Nope, no, =And

(M.Goodwin 1990: 289; Goodwin and Goodwin 1992:175)

E: Ohh man, that was bitchin.
F: That was.

(Pomerantz 1984: 67)

G: Where do you want me to leave it?
H: Right over there.

(author data, KH)

function in the world to "resolve more informational uncertainty" (to use the Shannonian terminology) faster and more decisively than could recourse to "private intentional" system wherein:

> "To *mean* something by *x*, *S* must intend:
> (a) *S's* utterance of *x* to produce a certain response *r* in a certain audience *A;*
> (b) *A* to recognize *S's* intention (a);
> (c) *A's* recognition of *S's* intention (a) to function as at least part of *A's* reason for *A's* response *r*."
>
> (Strawson's formulation of Grice 1971:155)

Thus, rather than having to discern all of the invisibilities of each other's intentions so as to reach rational certainty about what another "means" (and despite the fact that it has never been made clear how such a thing could, even in principle, be reliably done), participants to interaction here, as in the entire biosemiotic world, need only learn how to successfully manipulate a publicly available system of signs.

The accomplishment of such "shared knowledge" is less straightforward and effortless than it might first appear however, in that all four of the above examples "point outward" from the talk itself to a larger world of agent-object-action interpretations that, too, have to be negotiated *prior* to the exchanges above if those exchanges are to make any sense. Such prior orientation to a mutual understanding "makes sensible" (not just for we as analysts, but fir the actual participants) the at first glance odd-sounding sign exchange below:

A: I have a fourteen year old son.
B: Well that's alright.
A: I also have a dog.
B: Oh I'm sorry.

(Sacks 1968 April 17/1995: LC1)

The setting of the above exchange is a motel desk upon attempted registration. Here, as everywhere in semiotic interaction (human, verbal or otherwise) what is unsaid and implicit and what needs to be "negotiated" are not in the first instance "the private thoughts" inside the heads of individuals, but the public situation in which and through which agents' co-actions emerge and are embedded. [17]

The cultural aspect of this situation we have defined as the participant-accomplished matrix of symbolic reference (i.e., Deacon's diagram in Figure 4). And by attending carefully to the locally-administered co-construction of talk, we can catch empirical glimpses into the ways in which the "arrows" of that diagram work together to hold such reference stable.

Indeed, as we saw in the examples of "repair" and of "enregistered silences" examined in this article earlier: "through [such] procedures, the participants are thus released from the task of explicitly confirming and reconfirming their understandings of one another's actions. Mutual understanding is thus displayed … 'incarnately' in the sequentially organized details of interaction. (Heritage: 1984: 308, 258) [18]

For in the moment-by-moment updating of each other's understandings (and misunderstandings) that is continuously *created* in the back-and-forth of naturally occurring interaction, agents solve "the problem of other minds" not by seeking Cartesian "absolute proof" regarding the essential nature of each other's interior mental experience, but in accepting as entirely sufficient the situated "pragmatic proof" whereby actions and understandings are publicly accepted, rejected, negotiated and sustained.

Thus, we can now reformulate the "problem" of intersubjectivity as not an intensely private and insolvable question to be satisfactorily answered, somehow, through the logical operations of an individually isolated mind, but as the real-world situated challenge that is effectively and continuously accommodated by the public engagement with a Deaconian referential matrix system that, at least in humans, enables the very taking of signs itself to be taken as a sign, generating the recursive semiosis from which "ideas" become languaged, and the "thoughts" of oneself and of "others" are made literally available as genuine semiotic objects of experience.

Moreover, because such interaction is not dyadic, but triadic at every point, agents are not locked within a prison of autonomous sign-construction taking place entirely within their brains, but can literally participate in the construction of an inter-subjective semiotic world. In biosemiotic terms, such meaning-assigning interaction is not a privately held "theory of mind" so much as it is a communal "practice of mind" – the triadic semiotic locus wherein the unlabeled things of the world are carved into useable entities (icons), those entities are joined into relations (indexes), and both those entities and their relations are named (sign-ified) to be used not as entities or relations in themselves, but as self-acknowledged signs (symbols).

"Most simply put," writes Schegloff, "without systematic provision for a world known and held in common by some collectivity of persons, one has not a misunderstood world, but no conjoint reality at all" (1992:1296). Interaction Analysis is thus the empirical

[17] That such actions and their relations can, in human beings, become recursively embedded so as to result in the subjective experience of "languaged thought" is entailed by this observation, though cannot be justly discussed here. Suffice it to say by way of a review here that such thought derives from the symbolic reference of public activity both phylogenetically and ontogenetically, and not vice-versa.

[18] E.g.: "A: God isn't it dreary! B: (silence)" where such silence is heard as indicating *disagreement* by the refusal to supply an interactionally sanctioned "agreement token" within the appropriate <.10/sec SPP window. While: "A: I'm getting fat hh?" B: (silence)" where the exact same such silence is now understood to indicate *agreement* by the refusal to supply an interactionally sanctioned "disagreement token" within the exact same <.10/sec SPP window. (Data from *Levinson 1983:338).*

investigation into the "systematic provision" of such a conjoint reality that arises as the emergent product of interacting, sign-exchanging agents.

Building the Ecology of Signs

> "Mundane actors *operate* on the assumption that others will perceive and recognize the same world as they do. This assumption is *overwhelmingly confirmed* in routine procedures of "looking" and "telling" which routinely interlock with other's "looking" and "confirming"…[by such socially canalized *practices*] a 'known in common' world is incorrigibly assured as, simultaneously, the process, presupposition and product of the reasoning practices involved. … It is, moreover, produced as an incorrigible product, as an objective world which could not have been otherwise. By these means, the transcendent objectivity of the world is produced in such a way as to be invariant to all exigencies. Through these means, the *intersubjective availability of real world events* is produced and reproduced as the indubitably *given*, *stable* features of real world events which, for producers, it has always been" (Heritage 1984: 216).

It has been argued through this article that such work as Interaction Analyst John Heritage describes above is the project not of individuals in the first instance, but of a society of agents held together through their use of signs for the accomplishment of action in the world (such accomplishment including, in the human case, the collaborative use of ever-more semiotically embedded signs, such as language, that are themselves readily acknowledged *as* signs).

Born into such a society, the practices and methods of such real-time semiotic constructivism are available to the future system participants virtually from birth, where the earliest of sign-object-interpretant relations are embedded in the relations between accomplishment of successful action in the world and the collaborative motoric bodily rhythms and micro-coordinated alignments of back-and-forth biological interaction.

Indeed, studies of infant-parent affect synchrony, co-ordination of breathing rhythms, and "mutually attuned selective cueing" based on eye-gaze (Feldman 1996, Fogel and Branco 1997, Trevarthen 1987 1993, Schore 2001) reveal the development of a suite of critically important auto- and inter- regulatory skills of that may form the substrate upon which the later fine tuned and microtemporally choreographed "give-and-take" of moment-to-moment linguistic (and non-linguistic) communicative interaction can occur.[19]

Proceeding from such a system of previously established intersubjective normativity even prior to the beginning of "worded" language use, Interaction Analyst Charles Goodwin (1981) finds that in analyzing such empirical data as:

"Somebody said looking at my --- son, my oldest son…"

in its natural role as part of the experiential data of a child being exposed to naturally occurring adult talk, the fine-grained semiotic repair work made visible thereby provides a range of information, for the child being exposed to it, about how linguistic structures may be utilized in the language. For the child learning how to "put together" his of her native language, this everyday instance of self-repair:

> First, separates out a relevant unit, a noun phrase, from the stream of speech. Second, it shows where that unit can itself be subdivided. Third, it

[19] See Endnote to this paper.

> provides an example of the type of unit, an adjective, that can be added to the noun phrase. Fourth, it locates at least one place in the noun phrase where such an addition is permitted. Finally, in the contrast between the first and second version of the noun phrase, the repair shows that such an addition is optional. (Goodwin 1981:171)

Thus, the naturally occurring "stimulus" of semiotic interaction for child language learners – far from being that degenerate and impoverished "poverty of stimulus" that Chomsky claims supports his argument for the existence of an innate grammar – is extremely instead, extremely fine-grained and semiotically rich. Moreover, given the data that we have been examining here, the "grammatically formed sentences" of traditional linguistic analyses may themselves prove insufficient for gaining competence in *and* in understanding language use – were such invariably grammatically formed sentences the exclusive "input data" for native language users in the first place, which, as obvious, turns out not to be the case.[20]

Moreover, now we find that, having come to recognize that the hitches, perturbations, re-speaks and even such traditionally disregarded alexicalisms as "uh" and "huh" are all carrying extraordinary semiotic meaning and performing causally efficacious interactional work, we *still* have not sufficiently examined how fine-grained the semiosis of conversational interaction really is.

For when Goodwin inquired as to *why* the utterance:

"Somebody said looking at my --- son, my oldest son…"

"needed repairing" in the first place, he discovered that what was happening in that micro-second of interaction, was that Speaker A had lost the eye gaze of his recipient, B, precisely at this point in the utterance:

A: Somebody said looking at m[*:y
B: ((_____gaze_____)[*gaze breaks

Accordingly, at precisely the point that his recipient's gaze is lost (marked here as *), A elongates the word that had already been under construction in that micro-second ("m **y:**"), pausing audibly and by so doing "breaking the symmetry" of his prior talk with a marked change in rythym. And just as "symmetry breaking" almost always leads to immediate-next consequence in complex systems, so too, does it constitute a Batesonian "difference that makes difference" in the emerging structure of ongoing talk-and-interaction.

In particular, writes Goodwin, "such actions may be heard as displaying that the speaker is having difficulty in producing the next item in his utterance. [One result of this is that] because of the display of trouble they provide, such repair initiators function to request the gaze of a hearer" (1981:143).

And indeed, A's split-second introduction of a trouble-indicating repair initiator into the stream of talk in response to B's unanticipated gaze withdrawal accomplishes exactly this purpose of re-securing B's gaze, as illustrated below:

A: Somebody said looking at m[*:y son --- , my oldest son
B: ((_____gaze_____)[*gaze breaks]((____gaze___))

[20] Cf. Schegloff: "The notion of an utterance as the sole product of a speaker, or of a mind, could hardly have been entertained had real[-time] talk-in-interaction been what investigators [had set out] to come to terms with' (1995:20).

Thus, by repeating the part of the utterance spoken as his recipient was turning away from him, the speaker succeeds in producing the entire utterance constructed in his turn while his recipient *is* gazing at him (1981:130).

A discussion of the normative orientations that make it relevant for a speaker to have a hearer's gaze (or vice-versa) across a variety of what Goodwin calls "engagement frameworks" exceeds the space constraints of the current paper. Suffice it to say, however, that in spite of all the elements of talk-and-interaction we have discussed in this overview so far, it is yet analytically insufficient to speak of meaning-making and semiotic intersubjectivity as if it were the only words, turns, sequences and propositional understandings that were being co-constructed and co-assigned relevance, value and reference collaboratively by participants.

Rather, Goodwin's work both on aphasia and in workplace environments (in particular: Goodwin 1979, 1981, 1995, 2000, 2002), reveal how even more micro-temporally attuned is the collaborative interactive work being done *simultaneously* with all of the above semiotic activity by eye gaze, gesture, bodily posture, and the co-presence of a manipulable surround of material artifacts to be used as online structure-making and meaning-making resources.

Thus, in addition to displaying a micro-attunement to iconic and indexical signs (signs of breathing, silence, speaking rhythm, eye-gaze, etc. taken as signs of transition relevance spaces, first and second pair parts, insertion sequences, etc.), we find talk-in-interaction so semiotically laminated as to allow for participant's micro-attunement for signs whose referents are signs about the unfolding architecture of the current act of semiosis itself.

Conclusion: IA's Contribution to Bateson's Remedial Metaphysics of "Mind"

> "Both grammar and biological structure are products of communicational and organizational process" (Gregory Bateson 1971/2000:154)

> "What is a person? What do I mean when I say 'I"? Perhaps what each of us means by the "self" is in fact an aggregate of habits of perception and adaptive actions plus, from moment to moment, our "*immanent states of action*" (Gregory Bateson 1960/2000:242)

Even with all that has been said here, we have but yet scratched the surface of the many provocative findings that Interaction Analysis has discovered about the participant-driven, micro-co-creation of talk. Hopefully, a cursory enough overview has been presented, however, for researchers working with a cybernetic and biosemiotic perspective will be inspired to examine the primary IA research materials for the purposes of informing their own work.

In summation, there are four main points that I hope have become particularly salient to the reader from even the brief foregoing discussion. These four points are as follows:

(1) That in every actualized instance of talk-in-interaction, it is the participants themselves that are collaboratively self-organizing and maintaining a generative system order based on contingent responsivity and the opening up and closing down of action opportunity spaces. "Structure-for-use" in the world is built upon the microtemporal back and forth of situated interaction. This is as true for the interactions holding living entities together as it is for systems such as economies and cultures and ecosystems. Such a "metaphysics of the present moment" is the bedrock foundation of *reality*, the record of those statistically rare possibilities that have been actualized.

(2) That such structure as these participants are "secreting into the publicly shared environment" (to use interactional analyst Charles Goodwin's terminology) provides not only a "substrate" for message exchange, but is *itself* the primary semiotic resource the crafting of "mere words" (or "difference transforms") into cognition-enabling *information* (or "meaning"). For even in the symbolic matrix of virtual reality depicted in Deacon's diagram, the agents whose actions constitute that system order are still making meaning using *real-time cause and effect* as their fundament, as their scaffolding structure, and their proof-procedure. Their immaterial relations of semiosis yet have material consequences for the perpetual reshaping of the physical world. And, like every other living organism, by perpetually "collapsing the wave function of meaning," each moment's real-time actuality alone brings to these creatures into the next moment of irreversibly consequential possibility – and of situated, inescapable choice.

(3) In Wittgensteinian terms, individuals learn to play the language game by learning its moves, as those moves and their consequences are made publicly visible and available. Interaction Analysis thus lets us see the technology of language-use "carved at its natural bones and joints" in much the way the child learning to use language does – as holistic and irreducibly triadic practices of *sign, use and meaning* corresponding to the fundamental sign-object-interpretant relation of Peircean biosemiotics. Moreover, it has been suggested in this article that the existential situation of always having to collapse the wave function of possibility based on one's best possible "understanding" of such signs is ubiquitous throughout not just human language, but throughout the entire natural world. Indeed, the existential condition of "what action must I take now?" that nature forces upon all organisms at every moment of their existence is the ever-present cause and ground of *semiosis* itself.

(4) An in-depth look at the characteristics of this multi-party, self-organizing and self-maintaining system is instructive, I believe, in that it reveals to us once again how ubiquitous Batesonian principles of sytematicity and biosemiotic principles of sign-use are in organizing the worlds of living agents. For just as the investigations into chaos and complexity theory, into fractals and into insect sociality, into biosemiosis and emergent order, have all profitably extended Bateson's notions of cybernetics and system order – so, too, I hope I have shown here, does this examination into the micro-positioning and re-positioning of bodies, possibilities and signs reveals that this system does not just "express" – but *is itself an integral part of* – the very "thing" that we are looking for when seek to locate the source of human cognitive ability, or "mind."

Consider, then, the following "mentation-enabling" characteristics of this system:

"Mental" Characteristics of the System of Talk-In-Interaction:

<u>Turn-Taking Organization:</u>
Recursively self-maintenant structuring of understanding and action
<u>Contingent Responsivity:</u>
Intrinsic motivation for interaction; relevance at all points
<u>Transition Relevance Monitoring:</u>
Embodied, real-time motoric apperception and tracking of action possibilities
<u>Adjacency Pairing:</u>
Context dependant and context creating anticipatory resource; future-determining and present-manipulating
<u>Repair:</u>
System-detectable error; participant maintenance of normative calibration and system function

> Intersubjectivity: Publicly created joint definitions, subject to confirmation and falsification within the success and failure parameters of the encompassing system (cybernetic feedback; functional circle)
> Functional Heterarchy: The emergence of a genuinely adaptive Epistemological Web that is publicly available, stably held, internally navigable, individually accessible, information receiving and information bearing.

My claim is that such a system qualifies as an "ecology of mind" in the following Batesonian sense: "The total self-corrective unit which processes information, or, as I say, "thinks" and "acts" and "decides," writes Bateson, "is a *system* whose boundaries do not at all coincide with the boundaries either of the body or what is popularly called the "self" or "consciousness – and it is important to note that there are multiple differences between the *thinking system* and the "self" as popularly conceived:

> (1) The system is *not a transcendent entity* as the "self" is commonly supposed to be. (2) The ideas are *immanent in a network of causal pathways* along which transforms of difference are conducted…(3) The network is *not bounded by the skin* but includes all external pathways along which information can travel …It includes the pathways of sound and light along which travel transforms of differences originally immanent in things and *other people* – and especially in *our own actions*. (1971/2000:319). (4) Many events within the system shall be *energized by the respondent part* rather than by impact from the triggering part. (5) The system shall show *self-correctiveness* in the direction of homeostasis and/or in the direction of runaway. Self-correctiveness implies *trial-and-error*. Now these minimal characteristics of *mind* are generated whenever and wherever the appropriate circuit structure of *causal loops* exists. (1969/2000:490). [Because, again:] the *elementary cybernetic system* with its *messages in circuit* is, in fact, the simplest unit of *mind* and the transform of a difference *traveling in a circuit* is the elementary *idea*" (1970/2000:465).

Taken all together, I think that picture of real-time semiotic structure building and communication cybernetics offered by the findings of Interaction Analysis can help us think more fruitfully – which is to say, in more richly informed cybernetic and biosemiotic terms – not just about words and language – but also about cognition, and about agency, and, above all, about consequential efficacy of "meaning" and the implications that a *natural constructivism* offers as a framework for giving us a more accurate understanding about ourselves – and about how all systemic organization in our world of ever-possibility collapsing, interdependent irreversibility, unfolds.

ENDNOTE

A Biological Readiness For Intersubjective Accomplishment?

The idea that human beings are biologically adapted to the synchrony of turn-taking is one which has never before been examined formally, but a cursory study into the biosemiosis of the human embryo during ontogenesis may at least allow us to suggest a profitable area of future study here.

Embryonic parcellation, heartbeat, digestion, metabolism, and development are all critically dependant upon the back-and-forth activity taking place between embryo and mother, and development at all stages of ontogenesis has shown to be delicately sensitive to those body rhythms whose activity help determine the embryo's environmental surround (Greenough, Black and Wallace 1987, Moore 2001, Lewontin 1983, 2000). Rhythm and responsivity to it, in this sense, form a crucial part of every human's subjective experience long before birth – while prenatal auditory enregisterment of experimenter's speech has been detected as early as seven months prior to birth (Turkewitz 1993, De Casper and Fifer 1980).

Thus, it is not surprising that recent research into the biological co-ordination of body rhythms between newborn infants and their caretakers (Lester, Hoffman and Brazelton 1985, Bergman 1999, Fogel and Branco 1997, Feldman, Greenbaum and Yirmiya 1999) reveals that within weeks after birth (and thus many years prior to the adoption of any system of grammar, syntax or even meaning-bearing "content" lexemes) infants master the critically important auto- and inter- regulatory skill of coordinating their own breathing and other biological rhythms to the rhythms of the other people around them – and these people, in turn, regulate their own physiological rhythm patterns to those of the infant (Feldman 1996, Fogel and Branco 1997, Trevarthen 2001).

Such mutually achieved synchrony and co-regulated interpersonal coordination of body rhythms, wherein "both partners simultaneously adjust their attention and stimulation in response to their partner's signals" (Feldman, Greenbaum and Yirmiya 1996), may itself serve as the necessary substrate for participation in the fine tuned choreography of moment-to-moment linguistic (and non-linguistic) communicative interaction to occur.

In this way, the orientation to subtle action patterns arising transiently between agents – *and* to the consequences of one's *own* actions within the patterns (what Schore 2001 refers to as the ability for *contingent responsivity*) – can itself become an emergent *structure* for *interpreting* experience, long before the capacity for "understanding or producing a single word, and before conceiving of the fact that objects and events in the world are named" (Schore 2001: 166).

Earlier research of W.S. Condon and associates (Condon and Ogston 1967 1971, Condon and Sander 1974) that found that the onset of changes in body movements in 1-day-old infants was precisely synchronized with the onset of changes in syllabic output and other auditory boundaries in the stream of speech, but not with isolated vowel sounds or other non-linguistic input such as tapping.

The production of an interactively coordinated stream of speech, as we have seen throughout this article, itself provides a kind of carrier wave or "reference signal" capable of allowing separate participants to mutually synchronize their linguistic behavior. Thus the development of the foundationally interactive skill that allows one to rhythmically and motorically micro-attune one's attentions and actions to the oscillations of another participant's rhythmic behavior (and to, in so doing, initiate a reciprocal alignment) may play a critical role in enabling the kind of recursively contingent back-and-forth of communicative interaction of the type that we have been examining here.

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