

Confrontation and support in bonobo-human discourse*

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As part of a program to explore the communicative abilities of bonobo apes within the human-ape culture at the Language Research Center at Georgia State University, we made two complementary analyses of a conversation between Sue Savage-Rumbaugh and Kanzi. We made both a conversation analysis and a lexico-grammatical analysis of their interaction. The conversation analysis revealed the participants negotiating the interpersonal meanings of confrontation and support, while the lexico-grammatical analysis revealed the ideational domain of the confrontation and support. Although many of the contributions of both participants did not fully express all the relevant meanings, both participants interpreted each other's contributions in terms of their relevance to the patterns of interpersonal and ideational meanings being expressed in the conversation. We conclude that Kanzi's considerable language abilities have been underestimated. First, Kanzi (despite his limited syntax) and Sue jointly construe a recognizable social world through discourse. Second, in exchanging discourse roles with Sue, Kanzi negotiates the asymmetrical power relation between himself and Sue. Finally, Kanzi's accomplishment suggests that discourse semantics is a powerful motivation for the evolution of both interpersonal and ideational grammar.

1. Introduction

Ape language research has a history of controversy (Savage-Rumbaugh and Lewin 1994, Pinker 1994, Deacon 1997), In this paper, we propose a new

approach to Kanzi's communicative abilities. We contextualize this approach with a brief look at one of the more controversial issues.

1.1 Conflicting criteria for language: syntax vs. semiosis

At the present time there are conflicting criteria for determining whether apes use language. Is the defining criterion for language the presence of syntax or the presence of semiosis?

Calvin and Bickerton (2000), for example, claim that without syntax there can be only structureless protolanguage. Deacon (1997), on the other hand, claims that the key to language is the ability to symbolize. These two conflicting criteria for language arrive at dramatically different results when judging Kanzi's behaviour.

Bickerton (Calvin and Bickerton 2000: 38-40) denies Kanzi the ability to understand a novel sentence like "Kanzi, go to the office and bring back the red ball" as human language, even if he goes to the office and brings back the red ball, because Kanzi has only a protolanguage without syntax:

In fact, in understanding what something means, we have all sorts of clues from semantics, pragmatics, and situational context that are quite useless when it comes to production. I don't think for a moment that Kanzi knew the grammatical structure of "Go to the office and bring back the red ball" if he knew what 'go,' 'office,' 'bring,' and 'red ball' meant, he wouldn't have to be a rocket scientist to figure out what he had to do.

At the same time, Bickerton (Calvin and Bickerton 2000:23-24), referring to Deacon (1997), rejects a semiotic account of Kanzi's language abilities:

I'd like to comment on a recent suggestion that the rubicon between our species and others falls at the symbolic rather than syntactic level. In other words, it's words, not sentences, that dramatically distinguish our species from others. [...] In fact, as was apparent nearly two decades ago, the real rubicon, unpalatable though this may be to the philosophically minded, is syntax, not symbols.

Deacon (1997: 124-126) indeed credits Kanzi with symbolic language, but does not, as Bickerton would suggest, limit symbolic value to words. Nor does he privilege syntax. What makes meaning symbolic is the possibility of systematic choices. Although sentence internal grammar is not our focus, we see Bickerton's 'syntax' as one of the ways in which systematic choice manifests itself in recognizable structures. But 'syntax' is only one of the structural

resources available. There are also structures of intonation and structural configurations in semantics. And discourse itself is structured. All of these structures do the work of making and expressing symbolic meaning. As Deacon (1997: 312) points out, the right hemisphere of the brain is heavily involved in such processing:

The right hemisphere is not the non-language hemisphere. It is critical for the large-scale, semantic processing of language, not word meaning so much as the larger scale symbolic constructions that words and sentences contribute to: complex ideas, description, narratives, and arguments. Symbol construction and analysis do not end with the end of a sentence, but in many regards begin there. The real power of symbolic communication lies in its creative and constructive power. Since symbolic representation is intrinsically compositional, there is no upper bound to the compositional complexity of a symbolic representation.

In our study we are particularly concerned with one of these "larger scale symbolic constructions that words and sentences contribute to", i.e. casual conversation. Indeed, our study, by examining Kanzi's discourse, indicates that Bickerton's assumption (Calvin and Bickerton 2000: 137) "that language began in the form of a structureless protolanguage, something like an early stage pidgin, without any formal structure just handfuls of words strung together" fails to account for the interactional dimension of Kanzi's communicative abilities. In our view, there is a larger structure --interactional structure-- which Kanzi controls even while his control of grammatical structure may be debatable.

1.2 How Kanzi learned

The most obvious obstacle to overcome when studying the actual or potential language abilities of apes is that their vocal tract is such that they cannot produce the speech sounds that humans do. The solution to this problem by ape language researchers at the Language Research Center at Georgia State University is a board of abstract symbols, or lexigrams, which apes use as words to speak with. In the early 1980s, as part of an ongoing research program aimed at uncovering the ape's potential for language acquisition, a female bonobo, Matata, was being trained, with limited success, to recognize the meanings of an inventory of lexigrams. Matata's adopted son, Kanzi, was present during Matata's training, but was thought to be too young to learn, and so was virtually ignored during these sessions. However, to everyone's astonishment, Kanzi began using the lexigram board himself, demonstrating

that he had learned the meaning of a number of lexigrams without explicit teaching. As a result, Kanzi has captured the attention of scientists outside the ape language research community (Savage-Rumbaugh and Lewin 1994, Savage-Rumbaugh *et al.* 1998).

1.3 Casual conversation: fundamental principles

Although Kanzi's language abilities have been extensively studied in experimental settings, much of his learning to interact with humans takes place through the mode of natural conversation. The discourse that we focus on in this paper is a typical interaction between Sue and Kanzi, which allows us to examine the world that is constructed in this conversation.

In order to examine this jointly constructed world, we have made extensive use of the analytical techniques of Eggins and Slade (1997), whose research aim was "to explore what it means to claim that casual conversation is critical to the social construction of reality". Their goal was to uncover the general principles underlying implicitness of casual conversation:

to show how social structures are negotiated, how attitudes and values shaped by differences of concern to the institutionalized social context are reflected in and modified by casual talk (1997: 316).

They found two principles at work.

The first principle is that casual conversation is only apparently casual. On the one hand, "the social functions of casual talk remain largely invisible to its participants" (Eggins and Slade 1997:316), but on the other hand, casual talk maintains and constructs reality. This is the "paradox" of casual conversation (Eggins and Slade 1997: 17):

we experience casual conversation as probably the only context in which we are talking in a relaxed, spontaneous and unselfconscious way. We feel it is the only place where we are really free to be ourselves and yet, at the same time, we are hardly free at all. We are in fact very busy reflecting and constituting our social world.

In other words, this paradox is the result of "a tension between, on the one hand, establishing solidarity through the confirmation of similarities, and, on the other, asserting autonomy through the exploration of differences" (Eggins and Slade 1997:22).

The second principle is that the exchange of interpersonal meanings is the engine that drives discourse, first because "the primary task of casual conversation

is the negotiation of social identity and social relations", and second because "the open-ended, turn-taking organization of conversation differentiates it from other linguistic activities" (Eggins and Slade 1997:49-50). As a result, discourse foregrounds interpersonal, rather than ideational or textual meanings. For example, "the observation that anything can be the topic in casual talk in casual conversation [...] suggests that the important work of casual conversation is not in the exploration of ideational meanings". Rather, ideational meanings play a facilitating role: "any ideational domain (or Field) serves as the environment for the exploration of social similarities and differences" (Eggins and Slade 1997:50).

2. Questions to be asked

An examination of Kanzi's discourse offers a new perspective on Kanzi's linguistic abilities. The embedding of Kanzi's utterances in the flow of discourse reveals that his communicative abilities may have been underestimated. Unlike the study of Kanzi's utterances in terms of decontextualized syntax, consideration of the interactive dimension of discourse allows us to ask three inter-related questions, which have both ontogenetic and phylogenetic implications.

2.1 What kind of social world are Kanzi and Sue jointly construing?

As we shall see, this world is not random and anti-social, but highly organized and social. Moreover, the turn-taking principle on which it is based is the environment *par excellence* for the development of 'role-reversal imitation', which is crucial in the ontogeny of human cognition (Tomasello 1999: 103-107).

2.2 To what extent does Kanzi participate in the human, continuous negotiation of differential power relations?

As we shall also see, Kanzi fully engages Sue in an activity fundamental to the development of human cognition, described by Tomasello (1999: 170) this way: "sometimes the semantic content of the discourse, what is being talked about over multiple discourse turns, expresses differing and sometimes conflicting construals of things". The point is that Kanzi and Sue are dealing with conflict by jointly construing discourse, rather than by hurling sticks and stones at each other.

2.3 To what extent might discourse be the motivational environment for the development of both interpersonal grammar (mood) and ideational grammar (processes, participants, and circumstances)?

The fact that Kanzi's moves in the first exchange, a negotiation of his demand for goods and services, are more richly patterned than his grammatical structures, is suggestive. Halliday's (1994: 70) perspective on human ontogeny is this:

in the life history of an individual child, the exchange of goods-&-services, with language as the means, comes much earlier than the exchange of information: infants typically begin to use linguistic symbols to make commands and offers at the age of about nine months, whereas it may be as much as nine months to a year after that before they really learn to make statements and questions. [...] It is quite likely that the same sequence of developments took place in the early evolution of language in the human race, although that is something we can never know for certain.

When Kanzi demands goods and services in a human language-rich environment, it does not mean that his behaviour represents a normal stage of evolutionary development. It *does* say, however, that this behaviour (as opposed to the social evolution of grammar) is not unique to humans. Ontogenetically it is interesting that Kanzi's exchange pattern deals predominantly with goods and services: a pattern of communicative behaviour familiar to us because we know what human children do (Halliday 1975; Painter 1984:252, 1999: 181-2). It is also interesting to speculate as to whether or not communication to achieve the exchange of goods and services formed an early basis for further differentiation (Halliday 1994:70) in the course of the evolution of human language (cf. Matthiessen forthcoming).

3. Data overview

3.1 Context of culture

For the past two decades, Kanzi has been, and continues to be, the subject of a study on nonhuman language acquisition. It has been demonstrated that Kanzi possesses a sophisticated comprehension of spoken English, as well as the ability to produce novel utterances via a lexigram keyboard (Savage-Rumbaugh *et al.* 1998; Savage-Rumbaugh and Lewin 1994). While the studies aimed at evaluating Kanzi's language abilities were conducted within the confines of the

laboratory in highly controlled situations, Kanzi's acquisition and application of language takes place in a very different context. As an adult, Kanzi's linguistic competencies reflect the social environment that he inhabits. That is, his daily interactions with researchers and caregivers at the Language Research Center are mediated by spoken English, gestures, and vocalizations, as well as lexigram keyboard use. Humans make requests of Kanzi, and he in turn is able to respond with utterances of his own. In addition, Kanzi utilizes lexigrams to alter his environment (make food requests, go outdoors, watch television, etc.). Kanzi is confined to indoor and outdoor enclosures, and therefore his linguistic utterances are often directed towards researchers that control the food and housing areas he has access to. As one can imagine, not all of Kanzi's requests can be met. His diet is limited so as to provide him with balanced nutrition. Kanzi must move from one cage to another for testing, cage-cleaning or repairs, and often must remain in certain areas while research is conducted with other apes at the lab. Just as researchers and caregivers must deny some of Kanzi's requests, Kanzi also, on occasion, refuses to do what he is asked. Given his size and strength, it is nearly impossible to physically force Kanzi to do something. Therefore, a degree of negotiation underlies many of the linguistic interactions between Kanzi and his human counterparts.

It is this cultural context that provides the framework for Kanzi's linguistic interactions with humans. Requests made of, or by, Kanzi are often met with alternative suggestions, conditional compliance, or counter-requests. The interspecies dialogue, therefore, is marked by confrontation and support, as both Kanzi and the researchers that work with him negotiate their common world through language.

3.2 Data

The data for analysis consists of an interaction between Kanzi and Sue Savage-Rumbaugh, recorded on videotape. Prior to the interaction, Sue has left the Middle Test Room with Nyota (a baby bonobo), to get a ball that Kanzi has requested. Sue and Nyota return after a few minutes. During the next minute of silence, Sue sets up the lexigram board for Kanzi so that it is usable, and visible to the camera, and gives the ball to Nyota, who holds it briefly, and then drops on the floor, making a loud noise. Kanzi then turns to the lexigram board and points to the symbols GO OPEN GROUPROOM. A transcript of this discourse is displayed in Figure 1.

(K1/1) GO OPEN GROUPROOM
 (S1/1) go open grouproom
 (K1/2) [gestures toward the grouproom]
 (S1/3/a) oh over there
 (S1/3/b) that's that would be a fun thing to do
 (S1/3/c) Yes Sue Wants To Open Grouproom
 (S1/3/d) but Grouproom Is Broken
 (K1/4) BROKEN
 (S1/5/a) yeah it's broken it's broken
 (S1/5/b) it's broken in there because mike is working on something
 (K1/6) PLAYYARD
 (S1/7) playyard
 (K1/8) [vocalizing]
 (S1/9/a) oh
 (S1/9/b) well Yes Playyard ... Tomorrow
 (S1/9/c) we can't go to the playyard today because we have to go through the grouproom
 (S1/9/d) and the grouproom is broken
 (S1/9/e) Today We Will Play Here
 (S1/9/0) In Middletestroom
 (K1/10) [points toward MIDDLETESTROOM]
 (S1/11/a) yeah yes yes middletestroom mm hmmm
 (S1/11/b) mm hmm that's what we're going to do
 (K1/12) BEDROOM
 (S1/13) and you're pointing are you pointing to the Bedroom
 (K1/14) vocalization/BEDROOM
 (S1/15) the bedroom
 (K1/16) [vocalization -- nods head up and down]
 (S1/17) you want to Open Bedroom
 (K1/18) [BEDROOM- K uses lexical info to provide yes/no info]
 (S1/19/a) well kanzi There Are Toys In The Bedroom For You
 (S1/19/b) We Can Play with those Toys in the Middletestroom
 (S1/19/c) Kanzi Is Staying In Middletestroom Today
 (S1/19/d) because mr. ida is Grabbing your Picture with his Camera
 (S1/19/e) uh huh that's why we're staying in here
 (S1/19/f) mm hrnm we can do things in here
 (K1/20) [Kanzi gestures toward the bedroom with his left hand]
 (S2/1) What Do You Want Me To Get
 (K2/2) SURPRISE

Key: K = Kanzi; S = Sue; Kanzi's lexigrams in UPPER CASE; Sue's lexigrams in Initial Caps; arabic/arabic/lower case = exchange/turn/move

Figure 1. 'go open grouproom' transcript

Exchange, *turn*, and *move* are the constituent units of discourse for Eggins and Slade. A *turn* consists of one or more *moves*, and is bounded by change of speaker. An *exchange* begins with an *opening move*, proceeds through a variable number of *turns*, and is terminated by a new *opening move* (whether or not by the same speaker).

3.2.1 Transcription conventions

'K' means Kanzi, and 'S' means Sue. The lexigrams Kanzi points to are printed in UPPER CASE. When Sue is pointing to lexigrams in addition to saying them, they are printed in Initial Captials. When Sue is speaking without pointing to lexigrams, her words are printed in lower case. The transcript also indicates *exchanges*, *turns*, and *moves*. *Exchanges* are indicated by an arabic numeral followed by a '/'. *Turns* are indicated by arabic numerals followed by another '/'. *Moves* are indicated by lower case letters.

3.2.2 Kanzi's gestures and vocalizations

Kanzi often moved or vocalized throughout the conversation. We have coded Kanzi's gestures and vocalizations only when they were clearly relevant to the negotiation. This occurred when Sue clearly interpreted them and reacted to them as part of the conversation.

4, Analysis

We have used two complementary types of analysis. The first examines the discourse moves in the interaction to see how the participants interacted; the second examines the lexico-grammatical patterns in the text to discover the point of the dispute.

4.1 The interaction

4.1.1 Theory: speech functions

The technique of analysis is the Eggins and Slade network of speech functions displayed in Figure 2. The network allows us to track interactive discourse in terms of *exchanges*, *turns*, and *moves*. The network is a complex of symbolic systems. A system consists of a set of terms or features which share an entry condition. (In this section, the terms and entry conditions of systems are printed in italics.) For example, the terms *open* and *sustain* share the entry

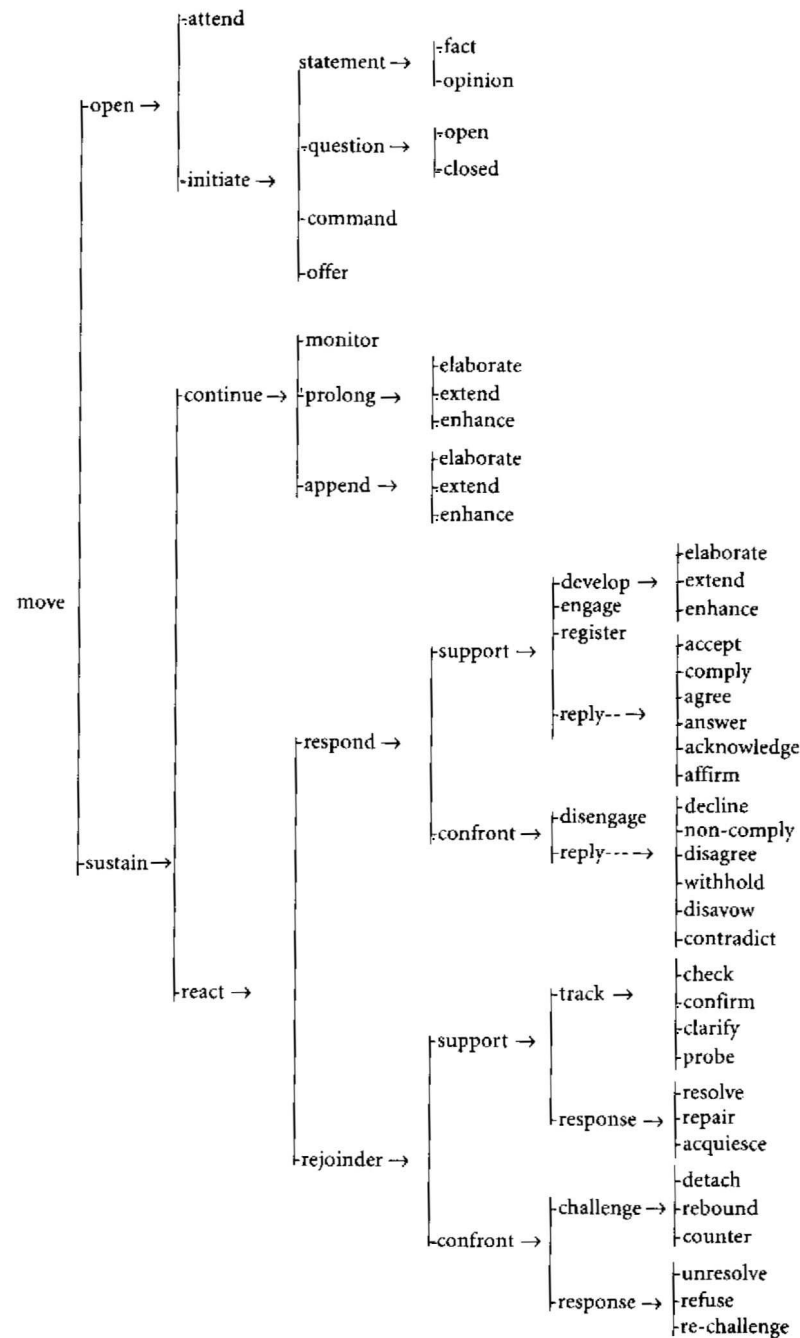


Figure 2. speech function networks (Eggs and Slade 1997)

condition *move*. Further differentiation of speech functions is achieved by making the terms of a system the entry condition of a new system. For example, the term *open* in the *move* system becomes the entry condition for a new system whose terms are *attend* and *initiate*. The network of systems is based on the concept that meaning is the product of choice among alternatives. Unless such choices are made systematically, there can be no meaning.

The first choice for the speaker in the network is between an *opening move* and a *sustaining move*. This captures the fundamentals of discourse: the need to start it going in the first place, and the need to keep it going once it is started.

There are two ways to *open* a discourse. The choice *attend* means to make a bid for the focus of an interactant's attention. The choice *initiate* means to set up a proposition or proposal for negotiation. At this point the network incorporates the Hallidayan system of basic speech functions (Halliday 1994). An *offer* is a proposal giving goods and services, and a *command* is a proposal demanding goods and services. Propositions deal with information. A *statement* is a proposition giving information, and a *question* is a proposition demanding information.

These four basic speech functions are classified as *opening moves* by Eggs and Slade. The rest of the network develops systems of speech function arising from the initial choice of the *sustain* option rather than the *open* option. Since there are many ways to keep discourse going once it has begun (as well as many ways of bringing it to completion), it is not surprising that the choices flowing from the *sustain* option are more complex than those flowing from the *open* option.

There are two ways to *sustain* the proposition or proposal under negotiation; it can be *continued* or *reacted to*. *Continue* is the option for the same speaker, and *react* is the option for a different speaker.

If a speaker is *reacting*, two choices open up: *respond* or *rejoinder*. The choice of *respond* is a signal that the *exchange* is moving to completion, whether through *support* or *confrontation*: e.g. a *question* will be *answered* (or not), an *offer* will be *accepted* (or not), a *statement* will be *acknowledged* (or not), a *command* will be *complied with* (or not).

Speakers choose *rejoinder* when they wish to negotiate further. Although *rejoinders* can be *supportive*, e.g. by *tracking moves*, the effect is one of delay. The *confronting* choices, e.g. the *challenging moves* (*detach*, *rebound*, *counter*), do more than delay. They quite naturally lead to *confronting responses*, e.g. a *re-challenge*, which in turn can provoke further *challenges*. *Rejoinders* thus have considerable power to *sustain* discourse, and prevent an *exchange* from coming to closure.

4.1.2 First analysis: speech functions in GO OPEN GROUROOM

Our coding of the discourse is found in Appendix 1. We now discuss the results *turn by turn*, in terms of the meaning of the *moves* in context. Once again, terms in the network of speech functions have been italicized.

Exchange 1 (turns 1-20)

Turn 1. The first *move* is jointly constructed by Kanzi and Sue. As Kanzi points to the lexigrams GO OPEN GROUROOM, Sue speaks them aloud. We interpret this as a kind of minimal support. In effect, what Sue is saying is something like: "you've pointed to GO OPEN GROUROOM; in my words that's 'go open grouproom'", Although the *move* is jointly constructed, it still belongs to Kanzi, and is a classic *opening move*. Kanzi is *initiating* an *exchange* with a *command* (demand for goods and services). Because it is an *opening move*, the negotiation must proceed in terms of Kanzi's proposal. Eggins and Slade (1997: 194) characterize *opening moves* this way: "because they involve a speaker in proposing terms for the interaction, [*opening moves*] are generally assertive moves to make, indicating a claim to a degree of control over the interaction". In this case, Kanzi's *command* maximizes his claim to control, since the preferred response to a *command* from the speaker's point of view is *doing-compliance* by the addressee. *Doing-compliance* requires more than a nod of the head in *acknowledgment*, and also would terminate the *exchange*.

Turn 2. Kanzi, but not Sue, *continues* his *opening move* by gesturing toward the grouproom.

Turn 3. Although Sue's first independent *move* is a *supportive* one, she is not yet in *compliance*. When she says "oh over there" (3/a), she is *registering* what Kanzi has just said. Eggins and Slade (1997: 204) say that *registering moves*

are reactions which provide supportive encouragement for the other speaker to take another turn. They do not introduce any new material for negotiation, and they carry the strong expectation that the immediately prior speaker will be the next speaker.

Sue's next three *moves* (3/b-d) represent a highly complex coding of ambivalence culminating in a *challenge* to Kanzi's *opening* proposal. We can tease this complexity apart by looking at the *moves* in sequence. On the face of it, Sue's "that would be a fun thing to do" (3/b) is *supportive*, for three reasons. First, there is the positive note struck by the appraisal item 'fun', in 'a fun thing to do'. Second, it is a *responding reaction*, the function of which is to "move the exchange toward completion" (Eggins and Slade 1997:200), and in this case,

completion would be to *comply* (or not) with the *command*. Third, as a *developing move*, it indicates "a very high level of acceptance of the previous speaker's proposition" (Eggins and Slade 1997:202). At the same time, however, there is a hint of trouble for Kanzi. The 'be' of 'that would be a fun thing to do' has been modalized by 'would', which places the doing in a probabilistic world, which lies between a definite yes (*compliance*) or a definite no (*non-compliance*) (Halliday 1994:356-7).

Sue's next *move* "Yes Sue Wants To Open Grouproom" (3/c) elaborates the *supportive developing move* (3/b), but also separates 'wanting' from 'doing', i.e. wanting does not imply actually doing (cf. Halliday 1994:288-289). And because Sue speaks the 'Yes' as a separate tone group with falling-rising intonation, which indicates reservation, the stage is set for a reversal of some kind.

The reversal comes in the final *move* in this *turn* "but Grouproom Is Broken" (3/d). Although (3/d) returns to the doing-domain of Kanzi's initial *command*, the reality presented amounts to *non-compliance*. But (3/d) is not the choice *confront: reply: non-comply* from the *respond* system. It clearly realizes a *confrontational rejoinder*. Since Sue doesn't offer any alternative, the next step is up to Kanzi. This is the essence of a *rebound*, which sends "the interaction back to the first speaker, by questioning the relevance, legitimacy or veracity of another speaker's move" (Eggins and Slade 1997:212).

Turn 4. Kanzi's BROKEN (4) is a *register*, similar to Sue's (3/a), It is not a *tracking move*, such as a request for *confirmation*, since Kanzi looks away at this point, rather than looking questioningly at Sue.

Turn 5. Sue, however, treats Kanzi's BROKEN as a request for *confirmation*, and *resolves* the issue in (5/a) "yeah it's broken it's broken". Sue's *enhancement* of the *confirmation* of (5/a) with a 'reason' for the grouproom being broken, "it's broken in there because mike is working on something" (5/b), serves only to emphasize her *rebounding move* (3/d). In other words, now that the clarification which Kanzi didn't request has been emphatically cleared up, the ball remains where it was, so to speak -- in Kanzi's court.

Turn 6. At this point, Kanzi, unlike Sue, proposes an alternative to the grouproom scenario: PLAYYARD(6). This is the essence of another type of *challenging move*, the *counter*: "these moves express confrontation by offering an alternative, counter-position or counter-interpretation of a situation raised by a previous speaker" (Eggins and Slade 1997:212). The nub of the proposal GO OPEN is pre-supposed, and very much still under negotiation, as far as Kanzi is concerned.

Turn 7. Sue's "playyard" (7) is clearly a request for *confirmation*, since it is spoken with rising intonation, unlike the jointly constructed *opening move* (1), which was spoken with falling intonation.

Turn 8. The most we can say here is that Kanzi's vocalizing (8) is a *sustaining move*.

Turn 9. Sue's 'oh' (9/a) is a *registering move*, since Sue seems to be treating Kanzi's vocalization (8) as supplying positive polar information in *response* to her request for *confirmation* (7). This is Sue's second extended *turn*, but unlike *turn* 3, Sue's *challenging move* comes near the beginning, "well yes play yard tomorrow" (9/b), which is then prolonged in *moves* (9/c-f). Because she is proposing a temporal alternative to Kanzi's *counter* in (5), Sue's *move* (9/b) is a *counter* rather than a *rebound*, as in (3/d), Sue *continues* her *counter* for four moves, by alternating reasons in support of her position with restatements of it. The *enhancing move* "we can't go to the playyard today because we have to go through the grouproom" (9/c) is followed by the *extending move* "and the grouproom is broken" (9/d); and the *enhancing move* "Today We Will Play Here" (9/e) is followed by the *elaborating move* "In Middletestroom" (9/f).

Turn 10. Kanzi points toward MIDDLETESTROOM, which is a *registering move*.

Turn 11. Sue's "yeah yes yes middletestroom mm hmm" (11/a) treats Kanzi's (10) as a *move* needing an *affirmative reply*, and in "mm hmm that's what we're going to do" (11/b), she *elaborates* the *counter* with which she began her previous *turn* once again.

Turn 12. Kanzi has become caught up in the discourse logic of *confrontation* (Egins and Slade 1997:212):

challenging moves more or less obligate the prior speaker to respond. However, very often the responses are themselves confronting: a query cannot be resolved, a counter is refuted, or a re-challenge launched. Reactions to rejoinder moves have themselves a certain rejoinder quality about them, and often lead to further challenging or tracking. It is not uncommon in casual talk to find lengthy sequences of such talk.

In *exchange* 1 so far, Sue *reacted* to Kanzi's *opening* proposal, GO OPEN GROUROOM, with a *challenging rejoinder*, "but Grouproom Is Broken" (3/d); Kanzi *reacted* to (3/d) with a *challenging rejoinder* of his own, PLAYYARD(6); and Sue *reacted* to (6) with another *challenging rejoinder*, "well Yes Playyard Tomorrow" (9/b). At this point, Kanzi is still committed to the nub of his original proposal, the pre-supposed GO OPEN, and offers a second alternative location in yet another *challenging rejoinder* BEDROOM (12).

Turn 13. Sue *reacts* with a *tracking move* requesting *confirmation* "and you're pointing are you pointing to the Bedroom" (13). This is the first in a sequence of three *tracking moves* by Sue, which are *supportive* in that they postpone the issue of *compliance or non-compliance*.

Turn 14. Kanzi *responds* with an *affirmative reply* (14). His vocalization appears to be a falling tone, and he points to BEDROOM.

Turn 15. Sue again requests *confirmation* with rising intonation on "the bedroom" (15).

Turn 16. Kanzi again *responds affirmatively* with a vocalization (16), nodding his head up and down.

Turn 17. Sue makes a third request for *confirmation*, "you want to Open Bedroom" (17).

Turn 18. Kanzi makes a third *affirmative response*, BEDROOM (18), using the lexical item on the board to provide polar information, i.e. yes it is the bedroom.

Turn 19. Being now quite clear about Kanzi wanting to open the bedroom, Sue makes a *developing move*, "well Kanzi There Are Toys In The Bedroom For You" (19/a). But as was the case with "that would be a fun thing to do" (3/b), the high degree of alignment with Kanzi's proposal is more apparent than real, since in her next *move*, Sue doesn't say, for example, "so let's go play with them in there right now". What she does say is an *extension* of (19/a), "We Can Play with those Toys in the Middletestroom" (19/b). Sue's next *move*, "Kanzi Is staying In Middletestroom Today" (19/c), is unambiguously a third *challenging rejoinder*. In the next three *moves*, Sue *prolongs* her *counter-proposal*, first with an *enhancement*, "because mr. ida is Grabbing your Picture with his Camera" (19/d), and then with the *elaborations* "uh huh that's why we're staying in here" (19/e) and "mm hmm we can do things in here" (19/f). At the same time, Sue's real reason for *non-compliance* (19/d) reveals that the 'reasons' given for her previous *challenging rejoinders*, "because mike is working on something" (5/b), and "because we have to go through the grouproom" (9/c) were factitious.

Turn 20. Kanzi hasn't given up negotiating his proposal, however, as he gestures toward the bedroom with his left hand.

Exchange 2 (moves 1 and 2)

Up to this point in the discourse, Sue has been on the defensive. In one way or another, despite the greater number of *moves* she has made, Sue has been dependent on Kanzi; that is, she has had to negotiate the proposal of his *opening*

move. At this point, she decides to take the initiative, and begin a new *exchange* by making an *opening move*, perhaps to pre-empt yet another *challenging rejoinder* by Kanzi.

Turn 1. In saying "what do you want me to get" (1), Sue is making an *offer*, which of course is contingent on Kanzi's provision of lexical information.

Turn 2. By pointing to SURPRISE (2), i.e. by providing the information that is necessary for Sue to carry out her *offer*, Kanzi accepts it.

4.2 Lexico-grammatical patterns

4.2.1 Theory: systematic repetition and cohesive harmony

The analysis in Section 4.1.2 focussed on the interaction taking place between Kanzi and Sue through looking at the conversational acts which they produced. The analysis has not so far investigated the nature of the confrontation through an examination of the lexico-grammatical patterns jointly produced by the two participants. Can an analysis of these lexico-grammatical constructions help gain insight into the nature of the contestation and the way it plays out? In this endeavor, we would like to take an approach derived from two traditions: (a) cohesive harmony developed by Ruqaiya Hasan (1984), Halliday and Hasan (1985), and (b) the notion of systematic repetition developed by Eugene Winter (Winter 1977,1979; Hoey and Winter 1981). (See Fries (1992,1993) for other analyses that combine cohesive harmony with Winter's notion of systematic repetition within clauses that enter into matching relations). Both of these approaches examine parallels in lexico-grammatical expression, and therefore depend on a detailed lexico-grammatical analysis.

Let us begin by describing the notion of systematic repetition. It is Winter's contention that when clauses appear in a matching relation such as contrast, alternation or comparison, the clauses *must* express similar ideas, Winter believes the full expression of contrast goes through four steps.

General patterns for expressing contrast

- | | |
|--|--------------|
| Step 1: General comparison -- focus on difference | (Optional) |
| A differs from B | |
| Step 2: Statement of basis of contrast | (Obligatory) |
| X is true of A | |
| Step 3: Denial of validity of standard for compared item | (Optional) |
| X is not true of B | |

- | | |
|---|--------------|
| Step 4: Correction of Step 2 | (Obligatory) |
| (What is valid for B. This step provides the focus of the contrast) | |
| Y is true of B | |

As indicated by the term 'optional' beside Steps 1 and 3, not all expressions of contrast go through all these four steps. Rather, expressions of contrast are typically much shorter. The following *set* of examples illustrates the four steps, and how they may combine ((c) was the original example).

Examples of how the pattern may play out in text

- a. Complete (strong emphasis/highlight on the contrast)
 - (1) These two volumes differ.
 - (2) The first volume describes all the non-passerine birds so far found in Australia.
 - (3) The second volume doesn't describe any non-passerine species of birds,
 - (4) Rather, it describes the passerine species in Australia.
- b. Delete denial (Step 3) (less focus on contrast between the volumes)
 - (1) These two volumes differ.
 - (2) The first volume describes all the non-passerine birds so far found in Australia.
 - (4) The second volume describes the passerine species in Australia.
- c. Delete the general statement (conveys a minimum focus on the difference)
 - (2) The first volume describes all the non-passerine birds so far found in Australia.
 - (4) The second describes the passerine species_

Winter's model of contrast implies two major points. First, negation plays an important role in the interpretation of contrast. Whether or not Step 3, with its overt expression of negation, is actually present in a text, when we see a relation of contrast between two sentences (Step 2 and Step 4), we also necessarily interpret a negation as being involved, That is, Step 4 implicitly contradicts Step 2. Thus, in our set of examples above, the relation between Sentences 2 and 4 implies a negation whether we take option (a), (b), or (c). That is, we interpret Sentence 4 in each of the three versions as implying that the second volume does not describe non-passerine birds.

A second important point is that contrast implies systematic repetition. That is, two clauses which are in contrast with one another do not simply express

similar ideas, there must be patterns to the similarities and differences. To have contrast, we must have a background of similarity and a focus of difference. We can rewrite option (c) in the example above in such a way as to highlight this focus of contrast within a framework of partial repetition. In table I, we have filled in and marked with brackets information that is understood (e.g. by ellipsis).

Table 1. Alignment of two sentences in contrast in such a way as to highlight the similarities and differences.

	I	II	III	IV
2.	The first volume	describes	all the non-passerine birds	so far found in Australia.
4.	The second [volume]	describes	the passerine species [of birds]	[so far found in Australia].

Columns II and IV contain information that is repeated in the interpretations of the two sentences, Columns I and III contain the focus of difference. However, even in the columns in which there is a focus of difference, there must be a background of similarity and a focus of difference. In Column I, the background of similarity lies in that in both Sentence 2 and Sentence 4, the member of Column I refers to some volume of this book. The focus of difference lies in that these portions of the two sentences refer to different volumes. Similarly the background of similarity in Column III lies in that both sentences refer to various bird species. The focus of difference is that the two sentences refer to different sets of species. This sort of alignment of sentences in contrast helps the analyst determine what is assumed to be the common background, and what is assumed to be the focus of contrast in these sentences.

Clearly an examination of systematic repetition can benefit from a careful examination of exactly what is repeated and what is in contrast. One technique to discover repeated information in the messages of a text is to look at the cohesive ties, and the similarities and differences in the messages involved. Cohesive harmony, developed by Ruqaiya Hasan, addresses exactly these issues.

Cohesive harmony (Hasan 1984; Halliday and Hasan 1985) works on the assumption that most extended coherent texts take some topic and develop it in some way. An adequate analysis of such a text should capture such topic-centered development. Thinking intuitively, a topic-centered text should have relatively many messages which involve the same (small set of) participant(s)--the topic. Further, the messages of the topic-centered text should generally

revolve around a small set of ideas. How can one capture such topic-centeredness? As a first step one can examine the various chains of co-referential items in the text. Coherent texts regularly contain a limited set of referents which recur throughout the text. Each chain of references to an entity or small group of entities can be called an identity chain. The number of the identity chains in a text will provide a first measure of how many referents play a prominent role in the text. (Does the text center around a single main topic -- i.e. one identity chain -- or do several topics enter into the text?) As a second level of analysis we can examine the words used in the text, noting how words of similar meaning are distributed in chains throughout the text. Words which are related by any of the semantic relations of antonymy, synonymy, hyponymy, meronymy or strong collocational association are considered to express similar meanings. Chains of words which express similar meanings are called 'similarity chains'. Finally we can look at the similarities among the messages of the text. This is done by examining interactions among the various chains in the text. Two chains interact if and only if the same experiential relation holds between them in at least two clauses. The analysis of chain interaction will provide a measure of how much repetition of similar ideas the text provides.

4.2.2 Second analysis: lexico-grammatical patterns in GO OPEN GROUROOM

Appendix 2 provides a partial analysis of the 'go-open grouproom' text focusing on the interactions which involve Sue and Kanzi as Actors, material processes, and Locations or Goals. It also addresses a few other messages which are closely related to that set of interactions. In Appendix 2, the first column provides the move/turn/clause (as in Appendix 1). The second column provides the exact text as in Appendix 1. The third column notes every instance in which Sue or Kanzi (or both) are mentioned as Actors of some material process.¹ The fourth and fifth columns deal with polarity or modalities assigned to the material processes in which Sue and Kanzi are Actors of material processes. The sixth and seventh columns are two different types of material processes. Processes which are included in the 'Go' column (Column 6) are middle processes (See Matthiessen 1995). Middle processes have only one participant, an Actor. Processes which are placed in the 'Open' column (Column 7) are effective processes. These processes involve two participants, an Actor and a Goal. Columns 8 and 9 indicate Circumstances of Location or Goals, respectively for the processes in Columns 6 and 7. Finally, words in Column 10 indicate a temporal circumstance for the material processes in Columns 6 and 7, while the

last three columns indicate words which take part in attributive relational processes. Column 11 indicates a Carrier role while Column 13 indicates an Attributive role.

Each row on the table indicates a message (generally a clause) of some sort. Items are placed in the same column for two reasons. First, these items must be seen as either belonging to the same identity chain or to the same similarity chain. For example, all words placed in Column 3 refer either to Sue or to Kanzi or to both, and therefore these words constitute an identity chain. Similarly, all words placed in Column 8 refer to alternative parts of the LRC available to Kanzi to go to. They are thus related through the semantic relation of meronymy.

A second criterion for placing words in a column is that the words must be related to other chains in this portion of the text in similar ways. Thus, Sue and Kanzi are Actors of the various actions mentioned in Columns 6 and 7. The polarity items in Column 4 and the modal items in Column 5 all apply to the processes in Columns 6 and 7. Column 8, the locations, are all locations for going and playing (the processes mentioned in Columns 6), and the Goals (Column 9) are all *Goals* for the processes mentioned in Column 7. This constant relation to the remainder of the message is important to placement on the Table. Thus, a number of references to the grouproom (in S1/3/d - S1/5/b) are not placed in the 'Location' column because these instances fill the Carrier participant role, not the Location participant role in their clause.² In other words, although an effort to maintain the original word order has been made, placement in columns left to right represents common participant roles of similar items in similar messages, not word order.

A further point should be made here. At several places, information has been filled in by interpretation. Thus, (K1/1) GO OPEN GROUROOM is addressed to Sue. The normal way to interpret a command is to take the addressee as the Actor of any action that is requested. Therefore, even though this sentence does not mention Sue, her name has been placed in the appropriate column (in square brackets to indicate that this word did not actually occur in that clause) to show that Sue is the implied Actor of these processes.

Similarly, in (S1/3/b), Sue says "that would be a fun thing to do." The word that tells the listener that he/she knows what is being referred to and to go find the referent. As listeners, we have interpreted this word to refer to the proposal under negotiation: [Sue go open group room]. To indicate the relevance of this interpretation, the symbol "--" has been placed in each of the relevant columns of that message to indicate the meanings we have interpreted.³

The word *grouproom* has been entered twice in Clauses (K1/1), (S1/1), and (S1/3/b). This device was used to show that *grouproom* plays two simultaneous roles in these clauses. On the one hand it functions as a Circumstance of Location for the process of *go*. In addition, however, it also serves as the Goal for the process *open*.⁴

Clearly, the text is organized around a struggle in which one participant proposes alternative places for the activity that is about to take place. Can this analysis detect the fact that these destinations are being proposed as alternatives?

The first five utterances essentially repeat one another with little change. The first case where there is significant change is in (S1/3/c) in which Sue adds the modality *wants to*. As pointed out in Section 4.1.2, this modality takes the process out of the here/now/real and makes it unreal. Clause (S1/3/c) is followed by a clause which is introduced with a *but*. This *but* marks a concessive relation between the two clauses. That is, Clause (S1/3/c) sets up a chain of expectations. The *but* in Clause (S1/3/d) indicates that the expectation will not be fulfilled. One might make that contradiction explicit by filling in an intermediate step. But notice that even with the intermediate step expressed, the paradigm is not complete since Sue does not actually express the final step in her argument. In order to make her argument complete, we need to supply the unspoken conclusion. In order to present the logical and matching relations involved in Sue's concession, we have added the implicit material and marked it as implicit by placing it between square brackets.

- a. Sue wants to open group room
- b. [so we're probably going to open the group room]
- c. but the grouproom is broken
- d. [so we can't/won't open the grouproom]

The contrast implied in the original is made explicit in the systematic repetition between (b) and (d).

It is clear from Kanzi's reaction that he understands the implication in Sue's contribution that they will not go to the grouproom, for immediately after Sue finishes telling him that the grouproom is broken, he says *playyard*. Sue interprets this as suggesting an alternative place to go. (That is, she interprets it as fitting into Column 8 within the set of interactions described by Columns 3-10.) At first glance, Sue's first substantive response (S1/9/a) looks like she is supporting his proposal. It begins with *yes* and uses positive polarity. Like Kanzi, Sue omits to mention the Actors, the process and polarity or modality. However, included in her clause is the adverb *tomorrow*. This adverb clearly

presupposes and modifies the (implied) process and produces a configuration that is clearly not what Kanzi wants. Indeed, Sue immediately follows her apparently supportive contribution with a direct denial of what she understands Kanzi is requesting (playyard today).

Winter (1977: 165) found "With all denials, the most predictable clause relations are either reasons for the denial or corrections of the denial." (See also Winter 1977:490.) Sue has told Kanzi what is not going to happen; once she has finished explaining why Kanzi can't go to the playyard, her next move (S1/9/e) is to tell Kanzi what will happen. The simple statement with positive polarity associated with *will* (a type of future tense here) and *today* associates the assertion with the here and now and real. Sue's succeeding assertions (S1/11/f, S1/11/a-b) all emphasize that point. Indeed (S1/11/b) (*That is what we're going to do*) is interesting in how internally repetitive (and therefore emphatic) it is. Structurally it is a thematic equative clause (or pseudo-cleft, see Halliday 1994:42) in which the two parts *that* and *what we're going to do* are nominals⁵ which are identified and equated. The word *that* refers to the proposition that has just been presented previously -- *we will play here today*. But in addition the word *do* in the sentence is a substitute for the Residue *play here today*. Thus the second part of this clause is also equivalent to 'we're going to play here today'.

After Sue has been so emphatic in her denial of his proposition, Kanzi still tries one more time with the lexigram *bedroom*. Again, after a certain amount of checking on what Kanzi means, Sue interprets Kanzi's *bedroom* as fitting into the message paradigm with *bedroom* naming an alternative place to open.⁶ Kanzi confirms this interpretation by reasserting *bedroom*. Sue responds with a statement that displays systematic repetition with her interpretation of Kanzi's request and thus implies a denial of that request and a correction saying what they will do. This positive affirmation recurs three times in this portion of the conversation (S1/19/b), (S1/19/c), and (S1/19/e),

The final utterance in this exchange is Kanzi pointing to the bedroom. Interpreting this utterance is difficult. It is clear that Sue interpreted it as a request to get something from the bedroom. In this case this utterance would seem to initiate the next exchange, and more to the point for this analysis, would not be analyzed as fitting into the paradigm 'go open grouproom' that has been so prominent in the first exchange. On the other hand, this form is compatible with a simple reassertion of the request, 'go open bedroom'. In this case, the utterance would simply extend the message paradigm of the first exchange one more turn.

From the analysis above, it is clear that Kanzi's contributions are made and interpreted as relevant to the ongoing dynamics of the flow of conversation. It is possible to argue that Kanzi's contributions after (K1/1) all involve some sort of grammatical ellipsis. It is not necessary to argue this position, however, to interpret them. His contributions are all relevant to the patterns of meanings created and exhibited through the communications of the two participants, Notice that many of Sue's contributions are also partial clauses. In these cases, since we believe Sue knows English grammar, we have the grammatical device of ellipsis to fall back on to interpret the sentence internal grammar. However, even with her contributions, we interpret their relevance by reference to the patterns of meaning created through the various turns of the participants. Thus, even when she does not use elliptical constructions, she may leave her logic implicit (as in clauses S1/3/c&d). Kanzi is fully capable of filling in the implicit information and interpreting the thrust of Sue's contribution. Even without looking at the grammatical ellipsis, with all such an analysis implies for the control of grammar, this conversation is far more than simply "handfuls of words strung together".

5. Conclusion

We now return to our three questions.

- What kind of social world are Kanzi and Sue jointly construing in their discourse?

Despite the limitations of the lexigram board, and minimal, but not non-existent syntax (see Greenfield and Savage-Rumbaugh 1990), Kanzi's words are distributed systematically according to the rules of casual conversation. A social world *is* being jointly construed in this discourse. It is emphatically *not* "just handfuls of words strung together".

First, it is a social world organized by jointly construed discourse which plays out the "tension between [...] establishing solidarity through the confirmation of similarities, and [...] asserting autonomy through the exploration of differences" (Eggs and Slade 1997:22; cf Tomasello 1999: 170 cited above). Sue is doing her best to create an alignment with Kanzi, such that he will abandon his original proposal. Kanzi is doing his best to assert his autonomy by coming up with acceptable alternatives to his original proposal.

Second, it is a social world organized by jointly construed, sequenced complexity. Kanzi deals with Sue's mixed messages of confrontation and support with some considerable skill. At no point does Kanzi interrupt Sue (or Sue Kanzi for that matter). He waits until Sue's three quite different sequences of challenging moves (3/a-d, 5/a-b; 9/a-9/g, 11a/b; 19/a-f) are 'complete', before he reacts, although in the case of the third sequence, of course, his reaction is pre-empted by Sue's new opening move. Moreover, *both* Sue *and* Kanzi provide partial information in their turns, fully expecting that that partial information will be interpreted as relevant to and in terms of the ongoing interaction. Further, they both are successful in interpreting what is said by the other.

Third, and most important, it is a social world organized by turn-taking. Consideration of discourse as turn-taking provides a particularly strong bit of evidence in support of the contention that Kanzi's meaning-making abilities have been underestimated. In exchange 1 there are 20 turns and 35 moves. Excluding the initial co-turn, Kanzi and Sue take an equal number of turns (10 vs. 9), although Sue makes over twice as many moves as Kanzi (24 vs. 10). The point is not that Sue makes more moves per turn than Kanzi, but that turn-taking provides the ideal environment for 'role-reversal imitation', the capstone stage of a process of cognitive development that begins with a child's understanding of others as intentional agents (Tomasello 1999: 103-7). Tomasello (1999: 105) describes 'role-reversal imitation' this way:

the child must learn to use a symbol toward the adult in the same way the adult used it toward her. This is clearly a process of imitative learning in which the child aligns herself with the adult in terms of both the goal and the means for attaining that goal; it is just that in this case the child must not only substitute herself for the adult as actor (which occurs in all types of cultural learning) but also substitute the adult for herself as the target of the intentional act (i.e., she must substitute the adult's attentional state as goal for her own attentional state as goal).

Kanzi deploys speech function symbols in precisely this way, Kanzi's registers and challenges target Sue in the same way that Sue's registers and challenges target Kanzi,

Tomasello (1999: 106) continues:

the result of this process of role-reversal imitation is a linguistic symbol: a communicative device understood intersubjectively from both sides of the interaction. That is to say, this learning process ensures that the child understands that she has acquired a symbol that is socially 'shared' in the sense that she can assume in most circumstances that the listener also comprehends and

can produce that same symbol -- and the listener also knows they can both comprehend and produce the symbol. The process of understanding communicative signals -- as in chimpanzee and some prelinguistic infant gestural communication -- is very different in that each participant understands its role only, from its own internal perspective.

Perhaps the clearest example of 'role-reversal imitation', and thus of a canonical linguistic symbol is Kanzi's original command. Savage-Rumbaugh *et al.* (1998) gives an account of one experiment in which Kanzi was given 660 novel commands, e.g. "Put the toothbrush in the lemonade". Kanzi carried out 72% of these commands successfully, and clearly understood his role to be compliance. In the opening move of the first exchange 'GO OPEN GROUPROOM', their roles are just as clearly reversed: Sue is expected to be in compliance, and when she is not, she remains targeted, with alternative routes to compliance.

- To what extent does Kanzi participate in the human, and continuous negotiation of differential power relations?

The particular difference that is being negotiated between Kanzi and Sue in this discourse is power. The discourse enacts a power struggle. First, Kanzi has taken on the role of opening and initiating a discourse. This is very different from the role of sustaining. It is a claim to control. And a command is a powerful speech function. When Kanzi says 'GO OPEN GROUPROOM', the onus of compliance rests just as squarely on Sue's shoulders as it would rest on Kanzi's, if Sue were to say to Kanzi, for example, "Go to the office and bring back the red ball". Second, by making an opening move, Kanzi sets the agenda for negotiation. This makes Sue grammatically dependent on him, since she has to negotiate *his* proposal. In exchange 2, however, Kanzi's acceptance of Sue's offer is a tacit admission that he has failed in his challenge to her power: they will stay in the middle test room. The point here is not just that Sue will get toys from a room to which she, but not Kanzi, has ready access, but that this asymmetry of power has been enacted in their joint language (including gestural and vocal realizations of moves on Kanzi's part).

- To what extent might discourse be the motivational environment for the development of both interpersonal grammar (mood) and ideational grammar (processes, participants, and circumstances).

Kanzi's facility in enacting the symbolic roles of casual conversation suggests that discourse is an environment favourable to symbolic exchange of goods and services and also of information. Thus discourse provides a symbolic

environment favourable to the development of symbolic representation of transitivity roles and functions. (For a complementary view which derives syntax from discourse, see Rolfe 1999: 776-792.)

The dialogue analysed in this paper revolves around the exchange of goods and services. Thus, both Kanzi's opening move 'GO OPEN GROUROOM', and Sue's opening move "What Do You Want Me To Get" foreground this issue. At the same time, Kanzi's command and Sue's offer require the expression of processes and participants independent of the interpersonal role relationships. The packaging of Kanzi's command conceals what could be otherwise construed as involving two processes, whereas the packaging of Sue's offer reveals these two processes.

In the grammar of the first exchange, Kanzi's command 'GO OPEN GROUROOM' expresses a material process of 'doing' and a Range (Halliday 1994: 146-9) for the doing, and requires an Actor (the addressee Sue). What is concealed by the 'doing' is the mental process of 'wanting'. Because of their differential power relation, Kanzi assigns Sue a material 'doing', but implicitly Kanzi assigns himself both a mental 'wanting' and a Beneficiary role, i.e. Sue's 'doing' -compliance both satisfies his desire, and is done for his benefit. In other words, a semantic space is opened up for expressing two processes and two participants, as for example in the command Kanzi didn't use, 'WANT SUE OPEN GROUROOM' (Halliday 1994: 289), Here there is a Senser (Kanzi) and a mental process ('WANT'), an Actor ('SUE'), a material process ('OPEN'), and a Range ('GROUROOM').

In the grammar of the second exchange, Sue's offer "What Do You Want Me To Get" reveals rather than conceals the 'wanting'/'doing' distinction, and by foregrounding the complementarity of offers and commands, reinforces the motivation for the expression of two processes and two participants. An offer is the mirror image of a command. It pre-empts a command by anticipating it, and thus begins with compliance, for example, 'I'll get you a surprise, shall I?', where the Beneficiary role ('you') is made grammatically explicit. But there is an additional complexity in Sue's offer, because her 'what' makes the exchange of goods and services contingent on an exchange of information, in this case 'a surprise', which constitutes acceptance of the offer.

In short, the kind of complexity involved in the opening moves (offer, command, statement, and question) and responses in discourse creates an enormous motivation to develop the grammatical tools to accomplish these discourse moves. These grammatical tools include *both* a symbolic interpersonal lexico-grammar, with contrasts among imperative, declarative, interrogative

moods, *and* a symbolic ideational lexico-grammar. with participants, processes, and circumstances, in order to have something to negotiate about, and to map the interpersonal and ideational grammars onto each other.

Notes

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1. See Halliday (1994) for a description of the experiential metafunction of language: the process types, the participant roles and the Circumstances that are involved.
2. These occurrences of *grouproom* are, however, members of the identity chain which refers to the *grouproom* in this text.
3. Note that the entire clause "That would be a fun thing to do" is a relational clause and so looks similar to *grouproom is broken*. This clause (SI/3/b) does not belong in the same paradigm as *grouproom is broken*, however, since 'fun thing to do' is an attribute which has no lexical similarity to *broken*, and the Carrier (*that*, which stands for the entire proposal) also does not belong to any similarity or identity chain which is involved in interactions in any of the other clauses in Appendix 2.
4. Of course the analysis adopted here implies that we analyze *go* and *open* as two unrelated verbs. This analysis is not automatic. We might have analyzed *go* as a kind of (motional) modality on *open* and thus not a separate process in itself. In which case, *go open* would have been analyzed as a single process and the dual interpretation of *grouproom* would not have been relevant. The treatment used in this paper is similar to the discussion by Greenfield and Savage-Rumbaugh (1990: 564-566) for conjoined actions.
5. *That* is obviously a nominal in that it is regularly analyzed as a pronoun. The other part of the clause which is equated to *that* is an embedded clause - a clause that has become nominal in nature.
6. But also note the close association of *go* and *open*. Thus *bedroom* here is not only a Goal for *open* but also a Location for an implied *go*. A full description of the process types is beyond the scope of this paper. The concepts used are described in Butt *et al.* (2000), Halliday (1994), and Matthiessen (1995), among other sources.

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Appendixes

Appendix 1. Speech function codings for GO OPEN GROUROOM

functions	exchange	turn/move	speaker	text
open:	1	1	Kanzi	(i) GO OPEN GROUROOM
initiate:		1	Sue	(i) go open grouproom
command		[this is a co-turn]		
sustain:	1	2	Kanzi	gesture toward the grouproom
continue:				(assumed)
prolong:				
enhance				
sustain:	1	3/a	Sue	(i) oh over there
react;				
respond:				
support:				
register				
sustain:	1	3/b	Sue	(i) that's that would be a fun thing to do
react:				
respond:				
support:				
develop;				
elaborate				
sustain:	1	3/c	Sue	(i) YesSue Wants To Open Grouproom
continue:				
prolong:				
elaborate				
sustain:	1	3/d	Sue	(i) but Grouproom Is Broken
react:				
rejoinder:				
confront:				
challenge:				
rebound				
sustain:	1	4	Kanzi	(i) BROKEN
react:				(Kanzi looks away not
respond:				questioningly at Sue)
support:				
register				

sustain:	1	S/a	Sue	(i) yeah it's broken
react:				(ii) it's broken
rejoinder:				
support:				
response:				
resolve				
sustain:	1	Sib	Sue	(i) it's broken in there
continue:				(ii) because mike is working
prolong:				on something
enhance				
sustain:	1	6	Kanzi	(i) PLAYYARD
react:				
rejoinder:				
confront:				
challenge:				
counter				
sustain:	1	7	Sue	(i) playyard
react:				
rejoinder:				
support:				
track:				
confirm				
sustain:	1	8	Kanzi	vocalizing
sustain:	1	9/a	Sue	(i) oh
react:				
respond:				
support:				
register				
sustain:	1	9/b	Sue	(i) well YesPlayyard . . . Tomorrow
react:				
rejoinder:				
confront:				
challenge:				
counter				
sustain:	1	9/c	Sue	(i) we can't go to the playyard today
continue:				(ii) because we have to go through
prolong:				the grouproom
enhance				

sustain: 1 9Id Sue (i) and the Grouproom Is Broken
 continue:
 prolong:
 extend

sustain: I We Sue (i) Today We will Play Here
 continue:
 prolong:
 enhance

sustain: 1 9/f Sue (i) In Middletestroom
 continue:
 prolong:
 elaborate

sustain: 1 10 Kanzi points towards MIDDLE-
 react: TESTROOM lexigram
 respond:
 support:
 register

sustain: 1 11/a Sue (i) yeah yes res middletestroom rnm
react: hmm
 respond:
 support:
 reply:
 affirm

sustain: 1 11/b Sue (i) mm hmm that's what we're go-
 continue: ing to do
 prolong:
 elaborate

sustain: 1 12 Kanzi (i) BEDROOM
 react:
 rejoinder:
 confront:
 challenge:
 counter

sustain: I 13 Sue (i) and you're pointing
 react: (ii) are you pointing to the
 rejoinder: Bedroom
 support:
 track:
 confirm

sustain: 1 14 Kanzi vocalization/BEDROOM
 react:
 respond: [vocalization appears to be falling
 support: tone]
 reply:
 affirm

sustain: 1 15 Sue the bedroom
 react:
 rejoinder:
 support:
 track:
 confirm

sustain: 1 16 Kanzi vocalization
 react:
 respond: (nods head up and down)
 support:
 reply:
 affirm

sustain: 1 17 Sue (i) you want to Open Bedroom
 react:
 rejoinder:
 support:
 track:
 confirm

sustain: 1 18 Kanzi (i) BEDROOM.
 react:
 respond:
 support:
 reply:
 affirm

sustain: 1 19/a Sue (i) well kanzi There Are Toys In The
 react: Bedroom For You
 respond:
 support:
 develop:
 extend

sustain: 1 19/b Sue (i) We Can Play with those Toys in
 continue: the Middletestroom
 prolong: [the coding choice here lay bet ween
 extend: this 'supportive' incprctation and
 calling Sue's move a counter]

sustain:	1	19/c	Sue	(i) Kanzi is staying in Middle- restroom Today
react:				
rejoinder:				
confront:				
challenge:				
counter:				
sustain:	1	19/d	Sue	(i) because mr. ida is Grabbing your Picture with his Camera
continue:				
prolong:				
enhance:				[if 19/b is interpreted as counter, then 19/c is elaborate]
sustain:	1	19/e	Sue	(i) uh huh that's why we're staying in here
continue:				
prolong:				
elaborate:				
sustain:	1	19/f	Sue	(i) mm hnnn we can do things in here
continue:				
prolong:				
elaborate:				
sustain:	1	20	Kanzi	Kanzi gestures towards the bedroom with his left hand
open:	2	1	Sue	(i) What Do You Want Me To Get offer
initiate:				
offer:				
sustain:	2	2	Kanzi	(i) SURPRISE
react:				
respond:				
support:				
reply:				
accept:				

Appendix: 2. Systematic repetition in GO OPEN GROUPROOM

Column	1	2	3	4	5	6	7	8	9	10	11	12	13
			Actor Sue/ Kanzi	Pol	modal	go	open	Location	Goal group room group room	Temp	Carrier	Rel	Attr
(KI/1)	GO OPEN GROUPROOM	[Sue]	pos	go	open	grouproom							
(Sill)	go open grouproom	[Sue]	pos	go	open	grouproom							
(KI/2)	[gestures toward the grouproom]		pos			grouproom							
(S1/3/a)	oh over there		pos			there							
(S1/3/b)	that's that would be a fun thing [[todo]]	" - "	" - "	" - "	" - "	" - "			" - "				
(S1/3/c)	YesSue Wants To Open Grouproom	Sue	pos	wants to	open				group room				
(S1/3/d)	but Grouproom Is Broken										group room	is	broken
(KI/4)	BROKEN												broken
(S1/5/a.1)	yeah it's broken										it	s	broken
(S1/5/a.1i)	it's broken										it	s	broken
(S1/5/b)	it's broken in there because mike is working on something										it	s	broken
(S1/5/b)	PLAYYARD		pos			playyard							
(51/7)	playyard		pos										
(K1/8)	[vocalizing]		pos										
(S1/9a)	oh												
(S1/9/b)	well YesPlayyard ... Tomorrow		pos			playyard				tomorrow			

(S1/9Ic.i)	we can't go to the playyard today	we	neg	can	go	to the playyard	today	
(S1/9/c.ii)	because we have to go through the grouproom	we		have to	go	through the grouproom		group room is broken
(S1/9/d)	and the grouproom is broken							
(S1/9/e)	Today We Will Play Here	we		will	plaY	here	today	
(S1/9If)	In Middlelestroom					in middlelest room		
(K1/10)	[points toward MIDDLETESTROOM]					[here]		
(S1/1/a)	yeah yes yes middlelestroom mm							
(S1/11/b)	hmmm		pos			middlelest room		
(S1/11/b.i)	mm hmm that's [[what we're going to do]]	« _ _ .. " _ .. " _ ..		
(K11/2)	[[what we're going to do]]	we	pus	to	do [[?]]			
(S11/3.i)	BEDROOM		pas			BEDROOM		
(S1/13.2)	and you're pointing							
(K1/14)	are you pointing to the Bedroom		pas			BEDROOM		
(S1/15)	vocalization/BEDROOM		pos			the bedroom		
(K11/6)	the bedroom		pos					
(S1/17)	[vocalization _ nods head up and down]		pos					
(K1/18)	you want to Open Bedroom	[Kanzi]	pos	wantto		open	the bedroom	
(S1/19/a)	[BEDROOM _ K uses lexical info to provide yes no info]		pos				BEDROOM	
(S1/19/b)	well kanzi There Are Toys In The Bedroom For You							
(S1/19/c)	We Can Play with those Toys in the Middlelestroom	we	pas	aU!	play		in the middlelestroom	
(S1/19/c)	Kanzi Is Staying In Middlelestroom Today	Kanzi	pas		is staying	in the middlelestroom	today	
(S1/19Id)	because mr. ida is Grabbing your Picture with his Camera							
(S1/19/e)	uh huh that's why we're staying in here	we	pos		are staying	in here		
(S1/19/f)	mm hmm we can do things in here							
(K1/20)	[Kanzi gestures toward the bedroom with his left hand]					bedroom		
(S2/1/1)	What Do You Want Me To Get							
(K2/12)	SURPRISE							

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