Rhythm in Interaction

Robin Eve

Abstract
The purpose of this paper is to look at the various ways that rhythm in interaction is manifested in human communication, primarily language. First, various theories are viewed to show the relation between biological rhythms, and linguistic development through socialization, thus arguing for the significance of rhythmic structures in language, especially pair structures in interaction. Using the advantage of hindsight given through recent developments in linguistics, some earlier research papers are reviewed and theoretical conclusions are suggested that might have been made if analysis of rhythm in interaction had been applied to the data. As well as providing further hypotheses for testing they add to the argument that research in communication might be enhanced through the consideration of rhythm in interaction.

Keywords: rhythm, interaction, adjacency pair, intonation adjacency pair (IAP)

Biological Rhythms
In an article in the American Anthropologist (1980) Chapple argued that it was necessary to consider the biological basis of human activity to be taken into account when dealing with the human’s relation with the environment. Chapple argues that innate biological rhythms are manifested in human activity. He summarizes those rhythms as follows.

“Rhythms begin at the level of DNA and RNA, metabolism, cell division, and develop through a hierarchy system to the whole animal. ... they range from a frequency of 20 per second like muscle fiber discharge or the faster frequencies of cortical cell activity (up to 40cps); while phonemes occur at about 14 per second, syllables (and the breath pulse of the thorax on which they depend) have a 6 cps frequency, heart rate, 72 per minute, respiration rate, 16 cpm. There are then longer durations in activity and interaction and these combine to build intermediate, intradian cycles found in many physiological functions. Then they lengthen to the circadian rhythms, to menstrual cycles and the circannual rhythms, the latter setting in motion long periods of migration, hibernation, etc.” (Chapple, 1980: 745)

He goes on to explain how each population of oscillators from the cellular level on up combines into progressively more inclusive wholes, each whole having its own frequency of oscillation, to become the action and interaction rhythms of the total organism. These create a synthesis and establish the idiosyncratic pattern structure for each person. Each person’s individual structure of rhythms is selected and shaped by experience, i.e. by their learning process.

In interaction between two entities the cycle of action and inaction, of tension and relaxation, the so called relaxation oscillators (ibid: 748) is matched with a mirror image in the other side, but at 180 degrees out of phase. In other words, when one is active, or tense, the other is passive, or relaxed, and vice versa. This alternation in sequence, this repetition of the relaxation oscillators, is a continuing one and where there are no overlaps, or stumblings or interruptions the two entities are said to be in synchrony. For the most part the typical entities in such interaction may be considered to be individuals but such interaction
may also occur in such situations as a speaker and populous audience. For the most part, especially for this paper, typical interaction may be conversational exchange, but such interaction may also be seen in other forms of human activity.

Going up the hierarchical chain of rhythmic groups of rhythms, Chapple says humans require a certain amount of interaction each day, a requirement that varies between individuals, although individuals have their constants for each day. When individuals obtain a sufficient amount of synchrony or complementarity they will experience that level of activation of the parasympathetic division which leads, in literary terms to feelings of well-being, affection, and love.

Thus the biological need for the fulfillment of the desire for rhythm in interaction can be seen as a source of the desire for social activity. This is manifested in social conversation, and other such verbal exchanges in which the action and pleasure of conversation fulfill this human biological need. Chapple in 1980 thus provides the biological rationale of what Malinowski in 1923 defined as phatic communion. According to Malinowski, "language in its primitive function and original form has an essentially pragmatic character; that it is a mode of behaviour, an indispensable element of concerted human action." (Malinowski, [1923] 1999: 305) And such phatic communion makes up a substantial part of human communication. Many times, when humans wish communicate for the dissemination or exchange of information, they prefer to do it in social gatherings, although, especially with modern communication technology, it would seem unnecessary. So although we have books, and telephones and computers, etc. people still like to disseminate information in face-to-face situations such as meetings, conferences, lecture rooms, classrooms, etc. We also spend a lot of time in situations where the exchange of information may seem almost superfluous to the pleasure of communication itself, such as 'chatting' with our friends either on the phone, after work or school, or in the restaurant, etc. It may seem, especially to outsiders, that little or no significant 'information' is communicated in casual conversation, but very few would deny the pleasure or the satisfaction to be had from such communication. This is because it serves an often unrealized purpose which is the exercising of rhythm of interaction. And even computer technology has fallen into line with this human desire through the development of 'chatting on line,' whereby people can go some way towards fulfilling the desire of rhythmic synchrony through the alternation of sending and receiving written messages with a minimum of pause in between.

**Communication in Learning**

There is a relationship between rhythm in interaction and human mental development. Humans learn through communication, and that communication has an essentially rhythmic nature. In the following extract from Chapple it is possible to see the chain of development from biological rhythms to rhythm in interaction and from interaction to symbolic thought.

"We begin with individual human beings, intricately composed of a multitude of biological rhythms with very different quantitative properties. ... Though built on the fixed action pattern sequences of the species, they are shaped and selected by the experiential 'learning' process. We may realize the part played by sound and movement in framing patterns of interaction, though too often concentrating on one separated from the other. We are less aware that the symbolic forms which emerge, making up what we often call 'content,' take their meanings from those biological rhythms and their rhythmic substrates ...." (Chapple, 1970: 748).

Chapple, an anthropologist, in 1980 was encouraging fellow anthropologists to take heed of the individual's biological rhythms as a contributory factor in human social behaviour. From the other side of the fence, Bruner, an educational psychologist, has been saying that the next step in psychology, must take account of not only the individual's mental development but also of that contribution to it from the social environment, or
culture: "just as we cannot fully understand man without reference to his biological roots, so we cannot understand man without reference to culture." (Bruner, 1996: 164). Both, from different approaches, are saying that in human mental development there is an essential link between the individual mind and its social environment. This link is expressed by Bruner as follows, that "we respond with preternatural sensitivity to the way (our) world is represented in the minds of others, and by virtue of that sensitivity we form a representation of the world as much from what we learn about it through others as from responding to events in the world directly." (Bruner, 1996: 165)

Considering the nature of the exchange mechanisms in speech that lie at the heart of the acts of communication, or interaction, and are the theme of this paper, Bakhtin (1981), says:

In the actual life of speech, every concrete act of understanding is active: it assimilates the word to be understood into its own conceptual system filled with specific objects and emotional expressions, and is indissolubly merged with the response, with a motivated agreement or disagreement. To some extent, primacy belongs to the response, as the activating principle: it creates the ground for understanding, it prepares the ground for an active and engaged understanding. Understanding comes to fruition only in the response. Understanding and response are dialectically merged and mutually condition each other; one is impossible without the other. (Bakhtin, 1981: 282)

By referring back to Chapple's assertion of the position of rhythm in communication, one may conclude that a significant element in the development of understanding through response as expressed by Bruner and Bakhtin is rhythm in interaction.

The focus of this paper is to show how this rhythm in interaction is manifested in many ways in communication and at all stages of life.

Learning through communication may start in infancy before the child has developed any ability of verbal language. Research has shown how communication lays the foundation for the acquisition of linguistic skills. Snow (1977), Bateson (1979) recognized that the patterns of communicative exchanges between infants and their carers, share similar features with mature conversation. Using the advantage of hindsight it is possible to look at Snow's analysis and account for more than was done in 1977. Snow's analysis used the conversational model presented by Sacks, Schegloff & Jefferson (1974) as the basis tools for the analysis. (Snow 1977: 11) Among the 'grossly apparent facts' observed in conversation (Sacks, Schegloff & Jefferson, 1974: 700) the idea of a regular rhythm, or Chapple's idea of 'reciprocal oscillation' does not occur at all, and may even be denied. Although there may be a rhythmic cycle in the turn taking systems in conversation there are no conditions on the limitations of the turn order or turn size that would imply some kind of rhythmic cycle, or regular rhythm in action: in fact, quite the contrary. 'Grossly apparent facts' about conversation Nos. 5 and 6 state that turn order and turn size are not fixed, but vary. (ibid: 701). Thus it seems that the mode of analytical thought behind Sacks, Schegloff & Jefferson (1974) precludes any sense of rhythm in interaction.

This way of thinking is echoed in Snow's approach to her analysis. "The hypothesis that the mothers were using a conversational model in interacting with their children rests on two crucial assumptions: that they were trying to communicate specific information to the babies, and that they were receiving (or trying to receive) specific information from them." (Snow, 1977: 11) It is not till later Trevarthen (2000) and Malloch(2000), that rhythm is recognized as a relevant structure in children's conversation. When this idea is applied retrogressively to Snow's analysis it may account for one or two of her unresolved observations.

First of all Snow observed that it was of special interest that the mothers would choose a reciprocal system for interacting with babies still so young that their ability to communicate was very limited. (Snow, 1970: 11); in fact "the mothers made almost no use of a monologue mode; even when they did sing
songs or recite nursery rhymes they did so as part of a game in which the baby also played a role." (Ibid: 11). Furthermore, she observed that, “The nature of adults’ speech to 2-year-old children can also be better understood if it is recognized that such speech occurs within conversations and is largely directed towards keeping the conversation going.” (Snow 1977: 20). When one considers Chapple’s assertion that humans’ need reciprocal rhythmic interaction, and Malloch’s observations of a regular pulse in child and carer interaction, then one can add to Snow’s analysis by saying that the reason for the choice of a reciprocal mode of communication and the reason for the urge, on both sides, to keep the conversation going, is the desire, felt, expressed and shared mutually for rhythm in interaction.

**Pair Structures**

A structure in conversation was identified by Schegloff and Sacks (1973) and called by them the ‘adjacency pair’. Adjacency pairs, “consist of sequences which properly have the following features: (1) two utterance length, (2) adjacent positioning of component utterances, (3) different speakers producing each utterance... ‘Question-answer; ‘greeting-greeting; ‘offer- acceptance/refusal’ are instances of pair types.” (Schegloff and Sacks, 1973: 295,296). The concept of the adjacency pair can fruitfully be compared to a similar pair structure in intonation.

Bolinger (1986) observed that probably a majority of well executed utterances have a prosodic shape that correspond to a question-answer pattern such as, “Do you like them?” “I love them.” And this pattern occurs in longer utterances by one speaker such as, “If you like them, then try them.” In describing this pattern Bolinger says, “There’s a part that lays the groundwork, asks the question, that relates to what we already know or can guess, and a part that adds the figure of the ground, that answers the question, that supplies what was not already known. The first part is called the THEME and the second part the RHHEME” (Bolinger, 1986:46). Here one can see the semantic link with the adjacency pair. However the main thrust of Bolinger’s argument is that this is an intonation pattern. A “theme/rheme” utterance consists of two tone units, each with one prominent pitch change, thus forming one unit of a pair of pitch peaks. There is a prominence toward the beginning of an utterance and another at or near the end. (Bolinger, 1978: 489) The overall shape, rendered graphically, might resemble the outline of a suspension bridge.

When this intonational pair structure was first identified by Cohen and ‘t Hart (1967) it was nicknamed the ‘hat pattern’ owing to its hat-like shape. However, because of this relationship between the ‘hat pattern’ and the adjacency pair, and maybe in preference for a more orthodox sounding name, the ‘hat pattern,’ in this paper, will henceforth be referred to as the ‘intonational adjacency pair’ or IAP.

Both adjacency pair and the IAP are common occurrences in language. Schegloff and Sacks said that the adjacency pair is, “widely operative in conversation” (Ibid: 295) Comparably, Bolinger says that the IAP, “is encountered so often that it can be hypothesized as a universal tendency” (Bolinger, 1978: 489).

Such are the points of commonality between the two concepts that one might wonder if they are the same thing and whether the IAP may be considered the standard intonation of the adjacency pair. However there is one fundamental difference. The adjacency pair has no theoretical limit to the length of either member of the pair, whereas the intonation pair implies a limitation of a pair of tone units which therefore somewhat limits its length. Nevertheless comparison can be made.

As Bolinger’s description of the IAP is a prosodic rhythmic pattern in the utterance of an individual which shares its characteristic rhythm with that of a conversational exchange, it can be related to points made earlier about the relationship between social interaction and individual mental development, in this case linguistic development. It seems a manifestation of Vygotsky’s words that, “the very mechanism underlying higher mental functions is a copy from social interaction,” and that, “In their own private sphere, human beings retain the functions of social interaction”(Wertsch, 1979: 164).
I think it is possible to trace the development of the intonational adjacency pair from interaction in childhood through to adult speech. First of all consider the following example (Example 1) of word play, or sound play, between two non-English speaking children, taken from Ochs (1983).

And this play continues for a total of twelve pairs of exchanges, before the mother chips in to stop the game.

Ochs says that the girls are playing with the conventions of opening up and closing talk, and that there is a vocative as a summons and a response as in the adjacency pair. Ochs notes that the intonation patterns occur in pairs and that although there is overlap within the pairs there is never overlap between the pairs. Each pair stands almost isolated and, "as in other play sequences based on words, Meli always waits for Mama to complete her turn before starting the next pair". (Ochs, 1983: 181).

Ochs does not address the question of why they are playing the game, of why they are communicating when there is no information worthy of communication. The answer that suggests itself is that the children are enjoying the pleasure of the communication, through the comfort of reciprocal biological rhythms, recognized by Malloch in preverbal infants and here present in older children. The exchanges in this game do not only exhibit the pragmatic features of the adjacency pair as Ochs described. In addition the independence of each pair unit shows that it is an intonational unit in itself thus comparable to the IAP. So this can be seen as an exercise through the pleasure of rhythm in interaction by which the children simultaneously develop the linguistic structures of the adjacency pair and the IAP.

Such isolated pair rhythms as above can be seen to have a lot in common with the two word combinations that are recognized as one of the significant developmental stages of child language. (Brown, 1973). Brown's work is based on the development of grammar and syntax in child language. There is no or little mention of intonation, either melodic or rhythmic. In this way it is of its time. Following the Chomskian revolution in linguistics in 1960s the predominant philosophy was that language was virtually synonymous with grammar and the idea of intonation as a contributing factor in the language development was not considered significant. Therefore from Brown's work, we can only assume that there may be a self-contained intonational pair unit which coincides with the utterance of the two-word combination. It seems here is another possibility, with the advantage of hindsight to look afresh at the concept of the two-word combination in child language.

From the two word phrase it is possible to see two different ways how childhood language expands into adult speech, while still maintaining the pair rhythmic structure of the two word phrase and the

---

**Example 1**

<table>
<thead>
<tr>
<th>(Child’s name)</th>
<th>(Kaluli language) (intonation)</th>
<th>approx. English equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mama:</td>
<td>Meli Meli Meli Meli Meli Meli</td>
<td>Meli (the other child’s name)</td>
</tr>
<tr>
<td>Meli:</td>
<td>oh [rise]</td>
<td>yes?</td>
</tr>
<tr>
<td>Mama:</td>
<td>oh [rise]</td>
<td>yes?</td>
</tr>
<tr>
<td>Meli:</td>
<td>obe [rise-fall]</td>
<td>what?</td>
</tr>
<tr>
<td>Mama:</td>
<td>obe [rise-fall]</td>
<td>what?</td>
</tr>
<tr>
<td>Meli:</td>
<td>oh [rise-fall]</td>
<td>Ok</td>
</tr>
<tr>
<td>Mama:</td>
<td>oh [rise-fall]</td>
<td>Ok</td>
</tr>
<tr>
<td>Meli:</td>
<td>oh [rise]</td>
<td>Yes</td>
</tr>
<tr>
<td>Mama:</td>
<td>oh [rise]</td>
<td>Yes</td>
</tr>
<tr>
<td>Meli:</td>
<td>obe [rise-fall]</td>
<td>Whaat!</td>
</tr>
<tr>
<td>Mama:</td>
<td>obe [rise-fall]</td>
<td>What!</td>
</tr>
</tbody>
</table>

(Ochs 1983: 178-180)
IAP. Here is an example (Example 2) of extracts of two short narratives by a child which can be seen as chains of two word phrases, or nascent IAP structures. The strokes mark off the speech into intonation groups.

**Example 2**

- I see ribbon / get shop / I [...] / get house (?)
- ask lady/
- I go shop / bye bye / I goin’ shop / big bend /
- I get shop / bye bye /

(Öchs, 1983: 11)

Adult like morphology is missing from these short narratives. However in the following extract (Example 3) it may be seen how children can acquire adult morphology from an adult model. In this case the mother has responded to each of the child’s utterances with a longer corrected model of speech.

**Example 3**

<table>
<thead>
<tr>
<th>Child</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby highchair</td>
<td>Baby is in the high chair</td>
</tr>
<tr>
<td>Mommy eggnog</td>
<td>Mommy had her eggnog</td>
</tr>
<tr>
<td>Eve lunch</td>
<td>Eve is having lunch</td>
</tr>
<tr>
<td>Sat wall</td>
<td>He sat on the wall</td>
</tr>
<tr>
<td>Throw Daddy</td>
<td>Throw it to Daddy</td>
</tr>
<tr>
<td>Pick glove</td>
<td>Pick the glove up</td>
</tr>
</tbody>
</table>


If again the judgment of intonation from written script is accepted then it is possible to see that the child’s two word phrase is remodeled as an IAP. In addition, when it is considered that each of these pairs of child to mother exchange is a unit, then it is possible to see a further development in the rhythm of the exchange structures. On both sides a two peak phrase is answered with a two peak phrase; thus an expansion, yet still rhythmically balanced.

Moving on further, it may be shown how the two part phrase with its pair of focus points develops into grammatical patterns, a manifestation of the theories that say the prosodic shapes set up by rhythm in language may provide important markers of syntactic organization which can provide the child with a first step into grammar. (Cook, 2000; Morgan & Demuth, 1996; Vihman, 1997)

In Öchs (1963) there is discussion on, “a set of verbal constructions found in spontaneous conversational discourse. These constructions have in common the following format: **Referent + Proposition.**” (Öchs, 1973: 158)

In the first example from Öchs (Example 4) it is possible to see the pair structure there, which even in one person’s speech shows how an individual’s utterance may have a similar structure to the conversational adjacency pair. The next example (Example 5) shows how repetition may lengthen the overall structure although it fundamentally retains the essence of the pair structure.

**Example 4**

(K had been talking about the fact that his car radio was taken from his car)

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Prop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>K: They cleaned me out. <em>And my father oh he’s / he’s fit to be tied.</em></td>
<td></td>
</tr>
<tr>
<td>R: Tell Daddy to buy you some more.</td>
<td></td>
</tr>
</tbody>
</table>

(ibid: 158)

**Example 5**

Two girls; (in discussion about reading required for courses)

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Prop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B: ohh I g’ta tell ya one course, ((pause))</td>
<td></td>
</tr>
<tr>
<td>A: (incred-)</td>
<td></td>
</tr>
<tr>
<td>(Ref.)</td>
<td>Ref.</td>
</tr>
<tr>
<td>B: The mo-modern art the twentieth century art, there’s about eight books.</td>
<td></td>
</tr>
</tbody>
</table>
Ochs has it that in B’s second line there is one reference. It could be argued that the reference is expressed twice, thus showing the reference to be mentioned three times. From these referent + proposition pair structures in speech it seems reasonable to further include the topic-comment and the thesis-antithesis structures.

The Shakespearean director John Barton in teaching actor’s how to render Shakespeare’s prose recommends actors to look for and express the rhythm in the prose text that is shown by the thesis and antithesis, thus expressing in vary practical terms the essential relationship between grammatical and rhythmic structures. (Barton, 1984)

The purpose of the above exposition of a variety of material is to show how rhythm in interaction, in particular here the pair structure, is significant in speech development. From a physical rhythm in pre-speech it develops into a physical and verbal rhythm in childhood speech. From social interaction it is internalized as an individual’s speech pattern. As a pattern in speech, whether social or individual it acts as a structure from which a semantic grammar form develops. This shows not only that rhythm in language may provide important markers of syntactic organization which can provide the child with a first step into grammar but also continue that role in adult language. Rhythm may exist as a substructure in adult speech, even though this may not be superficially apparent.

**Conversation patterns.**

Back channel speech in conversation seems an area where it should be possible to see evidence of rhythm in interaction as part of the structure. It would seem reasonable to suppose that the use of back channel speech shows shared communication not only in the words, wordless noises and body language by which the ‘back-channeler’ communicates understanding to the turn holder, but, as importantly, back channel speech may be part of the system by which participants can unite in rhythm in interaction.

In the analysis of back channel speech in Japanese and English by Maynard (1986) little if any mention is made of prosody as an influencing factor. However, there are hints that may be clues to the unidentified role of rhythm in interaction. The researchers noted that a number of cases of back channel behaviour occurred clearly within the speaker’s turn without a break in the speech and they also occurred concurrently with the last syllable of the speaker’s utterance. Such occurrences beg the question of defining back channel as fulfilling some sort or role in the exchange of meaning within the conversation. In fact the researchers leave these questions unanswered and in reference to the second category say that, “Realistically such a phenomenon should be dealt with separately, since the relevant context is not provided before the listener responds. (Maynard, 1986: 1100). Within the concept of communication as an exchange of meanings such a mismatch between context and response may seem inexplicable. However a theory of rhythm in interaction would say that these apparently meaningless back channels are actually occurring at rhythmically salient points. Scollon observes that talk is rhythmically timed to a regular underlying metre or tempo. And Erickson has shown that in ordinary talk, people speak to each other in a regular metre of regular beats, and time their entrances and exits to the rhythm of these beats (Scollon, & Erickson cited in Scollon, 1982: 338) The fact that the listener can back channel mid-speech in a way that is acceptable and is no way interruptive suggests that there may be some kind of underlying rhythm occurring here with the listener responding to rhythmic clues, either given through intonation or body language by the speaker.

In fact the speaker may be as much involved in the organization of the regular occurrence of back channel as is the listener. In conversation, speakers regularly break up the flow of speech, into chunks, with tags that solicit listener response; for example, in English the tag question, and short phrases such as, “you know,” “right”, etc., and in Japanese short tag questions such as “ja nai?”, ‘Chigau?’ and the post-position particles such as ne, sa, yo no. (Maynard, 1986:1097) And in addition to the syntactic speech planning that may take place in the
pauses in the 'chunking' of the speech (Goldman Eisler, 1968, 1974) it is reasonable to suppose that this chunking occurs at fairly regular intervals in response to a desire for regular rhythm in interaction. And so adult conversation may be a blend of the desire to produce long linguistic structures that communicate meanings and the desire for rhythm in interaction that might prefer exchanges of units the length of the IAP. And this may be what lies behind the occurrence of mid-speech backchannels. There seem to be suggestions of this interpretation in the view that Maynard quotes that back channel, "... appears to provide the auditor with a means for participating actively in the conversation, thus facilitating the general coordination of action by both participants." (Duncan and Fiske, 1977: 202-203) cited in Maynard, 1986: 1092)

One only has to look at people engaged in casual conversation, i.e., where the topic is not of real importance, to notice a mutual back and forth of body rhythms, especially with the head. Then one asks oneself whether this conversation is for information exchange or for the pleasure of rhythmic exchange. It seems that back-channel behaviour could beneficially be re-examined to include the role of rhythm in interaction.

The next suggestion is that the recent controversy caused by users of mobile phones in public places may be related to rhythm in interaction. For some reason a person speaking on a mobile phone is considered highly offensive by many people in many countries. So much so that in Japan there are many signs and announcements made discouraging the use of mobile phones in public places. A typical one shows a young lady cheerfully chatting on the phone while those around her scowl offendedly. Consider that if the same speaker, in the same place and with the same language was audibly and visibly involved in a conversation with a partner it may be quite acceptable, even welcomed. There is something about hearing half a conversation that upsets people. And it is always a half conversation by a stranger. For such a complaint has hardly ever been made about hearing half conversations in familiar places such as on a line phone at home or at work. I think the cause of this uneasiness is an imbalance in rhythm in interaction. When hearing a conversation our own biological rhythms can respond sympathetically, but in hearing half a conversation there may be a sense of unfulfillment, that induces frustration. So deep is the rhythm of interaction in ourselves and so essential is it to our inner harmony that when this structure does not occur we are upset, especially if it occurs in a situation where we have no control and where we are passive receivers of the effects of our surroundings. This, I would suggest is the root cause of the mobile phone controversy. Furthermore, it may be extended to say that in a culture where rhythm in interaction is so important, if it may be interpreted as such from the high degree of back channel speech in Japan in comparison with the U.S.A., Maynard (1986), then the degree of stress caused by the unfulfillment of this desire may be increased, as shown by the amount of public announcements discouraging the use of mobile phones in public places.

Beyond Language

As well as exchange rhythms in speech it seems that they may also have a significant part to play in other forms of communication, one of which is games. Table games such as cards, etc. seem to reflect the human pleasure in communicative exchange. Even sports, especially bat and ball games, such as cricket and baseball have a 'question-answer' pair structure. And tennis, with its variants, is quite dialogic in its structure, paralleling closely the tension-release reciprocation between the opposite sides such as happens in conversation. In other words, such sports may by another way in which we fulfill our needs for reciprocal rhythms.

The author has also compared pair structures in language to binary forms in music and in some ways this paper is a development of some of the topics discussed in these former papers. (Eve 2000, 2002)

Conclusion

A lot of this paper is highly theoretical and is
intended to be so. It has been written to promote discussion and to develop hypotheses for further testing of intonation and rhythm in interaction. This is an area that until recently language research has tended to overlook. Trevarthen remarks, that, "The neglect of the sense of time in contemporary psychology and linguistics is astonishing." (Trevarthen, 2000: 157). One can see an interesting contrast between the attitude amongst linguists and the attitudes of professional users of language such as actors and comedians for whom timing is considered as an extremely important element of their craft.

In order to lay the ground for further hypotheses the purpose of this paper has been to show how rhythm in speech exists as one of the structures which make up language, and that it exists not only in infancy, word play and early language but may continue to be an influencing element in adult language. Rhythm in interaction fulfills the biological needs of rhythm and interaction. Beyond its overt expression in word play, poetic verse, and by extension into song and verse, it is also an essential element of phatic communion, that pragmatic aspect of language that deals with the negotiation of social relationships through language. One might call this communication for the sake of communication. And rhythm in interaction has also been shown to be one of the roots of communication through grammar and semantics, communication for the purpose of the dissemination of information.

The basic assumption here is that linguistic communication is achieved through the combination of many structures, such as semantics, syntax, intonation, body language, etc, as channels of communication which co-ordinate to make the complex whole of language. Linguistic communication may exist as a combination of these features, but at any one time, one, or some, of the channels of communication may predominate as the primary mode of communication to fulfill the function of language. Rhythm in speech is one such substructure.

References
systematics for the organization of turn-taking for conversation. Language 50, 696-735.

（平成15年10月8日受付）