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THE STRUCTURE OF DIALOG

1.   Introduction

The purpose of this paper is to provide a kind of tutorial concerning some of the phenomena which contribute to the structure of dialog. It, therefore, gives an overview rather than a detailed account of these phenomena. It must also be said that the overview is given from a linguistic pragmatic perspective, namely, that of "activity based communication analysis" and summarizes some of the more detailed accounts published elsewhere, cf. for example Allwood, 1995.

2.   Multilayered Constraints and Enablements

Human dialog and human communication, in general, exhibit a very complex network of relations which at the same time both make the interaction possible and constrain it. At least the following levels of organisation are involved in any human activity, where each level provides necessary but not sufficient conditions for the next main level and, thus, also necessary but not sufficient enablements (resources) and constraints on communication whether it occurs in spoken or in written form.

(i)   **Physical:** The communicators in dialog are physical entities and their communicative contributions are physical processes/entities (usually of an optical or acoustical nature).

(ii)   **Biological:** The communicators are biological organisms whose communicative contributions from this perspective can be seen as biological activation and directed behavior.

(iii)   **Psychological:**
(A)   **Perception, understanding and emotion:** The communicators are perceiving, understanding and emotional beings whose communicative contributions are perceptually comprehensible and emotionally charged phenomena.

(B)   **Motivation, rationality and agency:** The communicators are motivated (including ethical, cooperative motives), rational agents whose communicative contributions, consequently, are motivated, rational acts (compare Grice, 1975, Allwood, 1976 and section 3.3).

(iv) **Social:**
A: **Culture, social institution.** The communicators are, at least provisionally, members of a culture and of one or more social institutions and their communicative contributions can, therefore, be characterized as cultural and social institutional acts.
B: **Language.** They are also members of one or more linguistic communities and their contributions are normally linguistic acts.

C: **Activity**. They, normally, play a role in a social activity and their communicative contributions are contributions to that activity through their role, e.g. as a sales clerk telling a customer about the price of some goods or a teacher lecturing to students (see section 6).

D: **Communication.** They, normally, at a given point in time, focus more on either sending or receiving information, i.e., they are primarily either in the sender, (speaker, writer, etc.) role or in the receiver (addressee, listener, reader, etc.) role. In the sending role, they are mostly performing a particular communicative act which makes them the agent of actions such as stating, asking, requesting, etc. This leads to characterizations of their communicative contributions by such labels as sent message, speech, writing, statement, question and request. In the receiving role, they are instead agents of actions such as perceiving, understanding, evaluating and responding which are complementary to the actions performed in the sending role (see Allwood, 1995).

Since communication, in this way, involves a network of finely interwoven enablements and constraints, the "glue" or "cohesion" at work in an activity and a dialogue must be construed in a similar multilayered way. One of the consequences of this is that communication and the successive contributions to an activity mostly are characterized by such features as redundancy, predictability, recoverability but also, given the constraints on human perception and attention, by a certain indeterminacy with regard to what is the actual current relevance of its various dimensions.

In order, however, to analyze the nature of the redundancy in the "glue", the layers have to be described both individually and in relation to each other. It is to this task that I now turn, in trying to describe some aspects of the levels described above. I will start by first taking a look at some of the sources and vehicles of the information which is shared in communication. The basic perspective here is that communication, like the etymology of the word indicates, primarily involves sharing of information rather than transfer or transmission of information which are rather seen as a means to achieve such sharing.

3. Sources and Vehicles of Joint Information

3.1 Vehicles and sources

Human communication makes use of or is influenced by at least the following sources or vehicles of information.

(i)   Sources largely uninfluenced by mankind, often called *natural signs.* For example, clouds in the sky can tell us that rain is approaching.

(ii) Objects or behavior which has been unintentionally produced. For example, archaeological investigations of stone age trash heaps may tell us about stone age habits of culture or a reflexive gesture might tell us about an emotional state.

(iii) Intentionally produced Artifacts. For example, furniture or tools may give us information about the function for which they have been made.

(iv) Intentional action. Intentional actions can, for example, tell us about the purpose (intention, function or meaning) of the agent of the action. An important subset of intentional actions are made up of communicative actions, the primary function of which is to share some particular information with an interlocutor.

In human dialog all four types can play a role, even if mostly types (ii), (iii) and (iv) are relevant.

3.2   Multidimensionality

Human communication and dialog are, thus, multidimensional. Table 1 gives an impression of some of the terminology which can be used to describe this multidimensionality.

Table 1   Aspects of the multidimensionality of human communication

Human communication is			
Multi- modal	with	modality of	communication
medial	regard	mode	transmission
channel	to	medium	representation
vehicle		channel	perception
instrument		means	understanding

In principle, all the three main stages of communication, i.e., production, transmission and reception, have a multidimensional character. However, it is still a great challenge to find out more about how we distribute information over different modalities in production and transmission, or about how we integrate information from different modalities in perception and understanding. Is it reasonable, for example, to assume that there is both modality specific and modality neutral information? Or is all information really modality specific and what we might think of as modality neutral information just a complex correspondence between different types of modality specific information?

3.3   Motivation, rationality, agency, cooperation and ethics

One of the levels of organization (level (iii) B above) which is relevant for the study of communication allows us to see communicators as rational agents pursuing various motives and goals, some of which are cooperative and ethical. In fact, communication in

many ways seems to build on the human ability for rational coordinated (cooperative) interaction.

Let us now take a look at this ability. One of the first attempts to give an analysis of it was presented in Grice, 1975. Another attempt which avoids some of the difficulties in Grice, 1975 (cf. Allwood, 1976 and 1995) was presented in Allwood, 1976 where I made some suggestions in which I tried to build on Grice´s insights. The analysis presents six principles of communication seen as a species of rational motivated action and interaction.

(A)	Agency	(i)	Intentionality
		(ii)	Volition
(B)	Motivation	(i)	General
		(ii)	Pleasure/ pain
(C)	Rationality	(i)	Adequacy
		(ii)	Competence

The two first principles postulate that action is analyzed as behavior involving intention and volition. The next two principles postulate that motivation underlies action and often involves the wish to seek pleasure and escape pain. Other kinds of motivation involve, for instance, cooperation, ethics, power and esthetics. The last two principles say that rationality can be analyzed in terms of adequate (efficient) and competent (making sure of preconditions) action. The notions of agency, motivation and rationality are then used to give an analysis of ethics and cooperation as relevant for communication. Ethics is analyzed as involving the "golden rule" or in Kantian terms "universalizability" with regard to agency, motivation and rationality. "Doing unto others what you would have them do unto you" is claimed to entail "making it possible for others to be rational, motivated agents". If you consider other persons in this way, you take them into "ethical consideration". Communicative interaction is claimed to always involve some degree of cooperation which is defined as follows: Two agents cooperate to the extent that they:

(i)   take each other into cognitive consideration
(ii)   have a joint purpose
(iii)   take each other into ethical consideration
(iv)   trust each other with regard to (i) - (iii)

Communication always involves at least cognitive consideration, i.e., an attempt to perceive and understand/explain another person's actions whether they are meant to be communicative or not. If communication is intentional, it is further claimed to involve at least one joint purpose, i.e., the purpose of sharing information, or perhaps better, sharing understanding which incidentally also is what the etymology of communication (communicare: to make common or shared) indicates.

Communication is always cooperative in the first sense and mostly also in the second sense, even if it involves conflict. You cannot deal your opponent a blow, and stay safe, unless you cognitively consider him/her and for many kinds of conflictual action, you also want your opponent to understand what you are doing or saying which requires sharing at least some information and considering your opponent's possibility to do so as well.

Communication is, however, very often cooperative in much more than the minimal sense just described. Usually, it involves ethical consideration, we don't lie to other people (more than marginally), we don't usually hurt them, we don't usually impose on them. In fact, politeness norms in most cultures often seem to have the purpose of preventing pain and imposition. In most cultures it is, for example, more polite to say things analogous to *can you/would you open the window* than merely ordering *open the window*! Communication also often involves trust. Normally, we don't think others are lying, trying to hurt us or impose on us.

3.4   Understanding, explanation and empathy

Another facet of the multidimensionality of human communication and dialog is that the receptive side and not only the expressive, productive side of communication is multidimensional. Reception and interpretation require a combination of an "explanatory" perspective directed to causal regularities, an "understanding" hermeneutic perspective directed to interpretation of conventions and intentions, and an "empathic" perspective directed towards sharing emotions and attitudes.

We have already noted above that an important part of being able to understand another person is being able to interpret the purpose or the motives behind his communicative and non-communicative actions. If we cannot find any such purpose or motive, we cannot "understand" him/her as a rational motivated agent but have instead to try to comprehend his/her actions in some other way, for example, by "explaining" them causally. In fact, conceptually speaking, both "understanding"(in the narrow sense used here) and "explaining" can be seen as special cases of "comprehending" or "understanding in a wider sense" which can be defined as "establishing a meaningful connection between input information and stored background information". It could also be claimed that "understanding in a narrow sense", i.e., the understanding of intentions and motives, can be seen as a special case of "explaining", in view of the causal role of motives and intentions.

In everyday life and conversation, we constantly switch between an "understanding"(in the narrow sense) and an "explanatory" mode of comprehension. If another person coughs, this can be because he/she wants us to notice something fishy (purpose) or because something obstructed his/her breathing (cause). Likewise, if a normally shy person A says "I love you" to B, after he/she has had a few drinks, our comprehension of A's utterance would combine understanding (he/she was motivated by love) with explanation (the drinks had caused him/her to be less bound by social restrictions).

Thus, understanding guided by rationality, motivation and agency is an essential ingredient of both the production and understanding of human communication, but it is not the only ingredient. Other ingredients are provided by explanations in communications based on the physical, biological, psychological and social resources, and constraints. These are also necessary and are drawn upon continuously to supplement interpretation and comprehension when "understanding" in terms of rational motivated action is insufficient. Perhaps, though, we as communicators usually want to be "understood" rather than merely "explained" and therefore also primarily try to

understand others by trying to see them as relevant (motivated rational agents). However, we often combine this with comprehending them by "explanation".

Philosophically speaking, this means that, in relation to the views put forth, for example, in Dilthey, 1883 and von Wright, 1971, I do not believe that "explanation" and "understanding" should be pursued separately in something like "Geisteswissenschaffen" and "Naturwissenschaffen" but rather that they should be regarded as possibly analytically distinguishable modes of comprehension, for which it is a challenge to find new forms of integration.

There is also a third dimension of comprehension in the broad sense - empathy. Normally in communication, we are not only influenced rationally and cognitively but also affected by other people's emotions and attitudes. The mechanisms whereby this takes place partly depend on what has already been said about explanation and understanding but partly takes place on low levels of awareness via biologically conditioned processes of imitation and resonance. In the positive case, emotional influence results in empathy, i.e. sharing of feelings but in the negative case it can have the opposite effect of emotional closure, fear, aggressiveness and biased negative misinterpretation.

3.5   Levels of intentionality and awareness

In dialog and communication, we are, thus, producing, perceiving, understanding, explaining and empathising in a multidimensional way. Another aspect of this, which we have already touched upon in considering emotional influence and empathy, is brought out by considering the fact that communication and dialog usually take place on several levels of awareness simultaneously. Both the sender (speaker) and the receiver (listener) normally operate on several levels of awareness and intentionality simultaneously. The differentiation of these levels is a matter of continuous degree, but for some analytical purposes it has turned out to be convenient, to somewhat stipulatively, distinguish the levels indicated in table 2 cf. Allwood, 1976 and for a more technical treatment, Nivre, 1992.

Table 2.   Levels of intentionality and awareness in humacommunication

Sender	Receiver
• Indicate	• Be influenced
• Display	• Perceive
• Signal	• Understand

When information is **indicated,** the sender need not communicate the information in an intentional or aware manner. The information is communicated only by the receiver being influenced in some manner. For example, A might be influenced by B's pupil size to think that she is interested in him. When information is **displayed,** the sender is intending the receiver to perceive it. For example, A might use a stronger accent to show B where he comes from. When information is **signalled**, the sender is not only intending the receiver to perceive the information but also to perceive/understand that it is being displayed to him or her. Signalling is the normal case in linguistic

communication. Language, in fact, could be said to be a system for conventional signalling in the sense described here.

All objects of perception including human behavior and action, as we have seen, can indicate information. If the objects are manipulated to exhibit this information, the information is displayed. To signal, i.e., to display that one is displaying, it is convenient to rely on a system like natural language which conventionally is built for signalling. In natural language, articulated sounds (segmental (phonemes) and suprasegmental (prosody)) conventionally codify relatively simple meaningful units (morphemes and words), which can be put together into more complex meaningful units according to rules of grammar for different types of meaning combination.

Example 1 below illustrates the different cases

Example 1			
A: Did he come			
B: You bet	Signal	=	A can bet on X
Eye brow raise	Display	=	Noteworthiness
prosody (Texas)	Indicate	=	Geographical origin

In the example, B says *you bet* with a Texas accent, raising his eye brows. Using the levels of awareness and intentionality just distinguished, we may now say that B's verbal utterance signals that *A can bet on X,* B's eyebrow raise displays that there is something noteworthy about X, (*his coming*)and B's prosody indicates his/her geographical origin.

The receiver may also take in information on different levels of awareness and intentionality. Firstly, he or she might be merely causally influenced without any element of intentionality or awareness. This would, for example, be the case in so-called subliminal perception (Mehrabian, 1971) which is often involved in emotional influence. Secondly, he/she might perceive the information without understanding it. This happens when additional interpretation is needed of what is perceived, for example, when is listening to an unknown language. Thirdly, he/she might understand the information, which on the analysis presented here would mean that he/she were able to meaningfully connect the information with previously stored background information.

Let me now continue the description of vehicles of joint information by turning to a discussion of what means of expression and reception can be employed in communication.

4.   Types of Expression and Reception

In table 3 below, I give an overview of the means of production, transmission and reception typically used in human communication and dialog.

Table 3.   Means of production, transmission and reception of information

Production	Physical Medium	Reception
1. Direct means of expression		**1. Direct reception**
• Body	acoustic wave	hearing
- Articulatory gestures (speech, song)	electromagnetic wave	sight touch
- Other gestures	molecules	smell taste
• With an instrument picture writing	stone skin clay paper	
2. Means of representation • Symbolic (phonetic script --- Morse) • Iconic (picture, writing) • Indexical (audio, videotapes)		
3. Means of augmenting physical medium Megaphone Microphone Loudspeaker		
4. Means of transmission (preserve, reinforce) TV, radio telegraph, telephone		**2. Means of reception** TV, radio receiver telephone

Under point (1),we find means of production and reception which are directly controllable by human beings. This can either be accomplished directly by bodily movements or by bodily movement in combination with directly controllable special instruments. The most important communicative bodily movements are vocal and manual gestures and the primary modalities of reception are the five senses, especially sight and hearing. The physical medium for sight and hearing are electromagnetic and acoustic waves, while smell and taste are carried by molecules. If pictures and writing are used, the physical medium preserving them, historically, has been of many different kinds. The effect of these physical media is that the coverage of communication is extended over time and space.

The means of expressing and producing information are also means of representing information. We can, following Peirce (cf. Buchler, 1955) classify means of representing information according to the type of relation holding between the representing object and the represented object. **Symbols** are based on convention, e.g. words in a language, **icons** are based on similarity, e.g. pictures or diagrams and **indexical** representations are based on contiguity and causality, e.g. a cloud representing rain or an index finger drawing attention to that which is being pointed to.

In ordinary communication all three types of representation occur together. A single sign can, in fact, often carry information in all three ways. The three relations are therefore above all analytically but not necessarily empirically distinct.

Under point (3), we find various ways of augmenting the physical medium, such as megaphones, microphones and loudspeakers. These have the effect of increasing the communicator's local spatial range. Point (4) – means of transmission and reception – increases the effects found under (2) and (3) by more radically enabling us to bridge space and time through a combination of aids for production and reception going far beyond what is given in direct face to face communication.

5. Types of Content

5.1 Dimensions of content

Let us now take a closer look at the information or content which is signalled through communicative activity.

Each communicative act can be analyzed as having two basic communicative functions: an expressive and an evocative cf. Allwood, 1976 and 1995. The expressive dimension reveals the communicator's attitude, e.g. belief, surprise, wonder or desire to what he/she is communicating. The evocative dimension reveals what reaction the communicator intends to evoke in the addressee, e.g. belief, surprise, intention to action, action, etc.

Languages are built to accommodate the signalling of such attitudes through the default functions which conventionally are tied to moods. In table 4 below, some of these are exemplified

Table 4   Default functions of moods

	Expressive	Evocative
Declarative	Belief	Belief
Interrogative	Desire for information	The desired information
Imperative	Wish for action A	The wished for action A
Exclamative	Any attitude X	Perception of X

By using a declarative mood, a person can thus both express a belief and try to evoke a similar belief in an interlocutor. By using the interrogative mood he/she can both express a desire for information and make an attempt to evoke that information from an interlocutor and by using the imperative mood he/she can both express a wish for an action and attempt to get an interlocutor to carry out the action. As we can see, there is mostly a clear relation between the attitude expressed and the effect which is intended to be evoked. For example, the expression of a desire is linked to the intention to evoke action which would satisfy the desire.

The attitudes which can be expressed or evoked in communication can be analytically subdivided in a fairly standard way into:

(i)   cognitive (e.g. believe, know etc)
(ii)   emotive and (e.g. fear, happy etc) and
(iii)   conative (e.g. want, intend, etc)

Most attitudes, of course, contain ingredients of all three kinds. The actions which can be evoked are, in general, in a fairly straightforward fashion linked to the attitudes which can be evoked. So, for example, if A requests B to do X, the request is intended to evoke an action by way of the evocation of a mainly conative attitude, ie. the intention to do X.

Further, utterances can be analyzed as to their **directedness**. They can, for example, be directed to a particular addresser or group of addressees. They can also be addressed to everyone in a group or perhaps, even, to no on in particular.

Signalled content can further be subdivided as to whether it is **explicit** or **implicit**. Compare examples 2 and 3 below.

2.   A: Close the window
3.   A: It is cold in here

Example 2 is an explicit request, whereas example 3 might in a particular situation, where it is clear that A would like it so be warmer, function as an implicit request to close the window. The explicit content is, thus, directly connected with the means of representation (usually symbolic) used for signalling, while the implicit content is dependent on the relation between the signalled means of representation and the context.

5.2   Evocation, evaluation, response and obligations

The sharing of information in dialog is motivated by a combination of interest and obligation. The sender through his/her contributions attempts to evoke a reaction in the receiver which will exhibit some combination of cognitive, emotive, conative and behavioral properties. The receiver upon noticing that a communicative contribution is directed at him/her has to evaluate:

(i)   contact
(ii)   perception
(iii)   understanding
(iv)   reaction to evocative intentions

This means that he/she has to evaluate whether he/she is willing and able to share the information (and possibly additional information), to perceive it, to understand it and react in harmony with the evocative intentions. Such evaluation seems to be motivated by pure self interest and seems to be a more or less automatic, biologically given reflex. It constitutes a necessary but not sufficient step in building up dialog cohesion. If dialogue, communication and social structure is to be created, the person who has the receiver role must now take on the sender role and report on the result of the evaluation.

If he/she cannot (or does not want to) continue contact, this can be reported directly or indirectly by utterances like *I can't talk now, I have to rush*. If he/she cannot (does not want to) hear, utterances like *what, pardon, excuse me* etc., can be used.

If he/she cannot (does not want to) understand, depending on circumstances he/she can say *I don't understand, what do you mean*, etc.

If he/she cannot (does not want to) react in harmony with evocative intention, he/she can say so but cooperation, ethical considerations and trust would normally require that some reason is given for the lack of compliance.

In reporting on the evaluation, the receiver is, in fact, always immediately affected by the nature of the interaction which the evaluated contribution is a part of. What kind of activity is it? What is the receiver's role in this activity (see below section 7)? What degree of cooperation, hostility characterizes it?

The answers to questions such as these will, to a large extent, influence the outcome of the evaluation and the responses which are produced.

What keeps a dialog together, enables it and restricts it, must therefore be sought in a combination of the nature of the contributions that the participants direct to each other and the nature of the joint interests (or lack of interests) and obligations (or lack of obligations) they have toward each other in virtue of the activity they are pursuing.

5.3   Dimensions of context

As we have see, implicit information relies on context in order to be conveyed. The following parameters can be helpful in classifying different kinds of contextual influence.

(i)   ±   **linguistic**: Is the source of contextual influence linguistic or nonlinguistic?

(ii)   ±   **perceptual**: Is the source of contextual influence directly and continuously available through perception to the participants.

(iii)   ±   **activity:** Contextual influence is mediated not only through perception, but also through memory. Since communicators mostly are engaged in some joint activity, perception and memory related to this activity is one of the most salient influences on communication

(iv)   ±   **other memory activation**: over and above directly given perceivable information and activity assumptions, there are many other kinds of information that can be activated through memory and help determine what interpretation we give our interlocutor's linguistic or other communicative behavior.

Let us now consider some examples of contextual influence. I will first consider linguistic context (cotext) and then non-linguistic context (cosituation). In the examples, I will describe different kinds of contexts through feature matrices based on the parameters given above.

(i)   The first kind of context can be characterized as follows:
        (+ linguistic, + perception, + other activation).
        This kind of contextual influence occurs, for example, when we realize that the word
        heavy in the expressions *heavy stone*, *heavy argument* and *heavy water* must mean
        different things. The information activated by the head constituent of the NP
        (*heavy X)* together with the requirement that *heavy* be compatible with this
        information determines the interpretation we give to *heavy.*

(ii)   The second kind of context is **(+ linguistic, + perception, + activity)**.
        This kind of context is also linguistic and can be found in dialogs. The inter-
        pretation of the function of an utterance very often relies on an interpretation of the
        activity function of the previous utterance. Compare the following examples:

    4.   A: It's raining
         B: Yes (it is)   agreement

    5.   A: It's not raining
         B: Yes (it is)   disagreement

    6.   A: Will you close the window
         B: Yes   acceptance

        The semantics of the word *yes* is such that after a positive statement it signals
        agreement but after a negative statement it signals disagreement and after a request it
        signals acceptance.

(iii)   Let us now turn the influence of nonlinguistic context (cosituation). The simplest
        cases probably occur with what is often called deixis, cf. Lyons, 1977. Words like I,
        you, here, these, now, then, tense endings etc., require access to the speech situation
        (speaker, hearer, place and time) to be given fully fledged meanings. This third kind
        of context can be described as follows **(- linguistic, + perceptual)**.
        Over and above the directly perceptual information, in many cases, activity or
        other activated information would also be relevant. This would, for example, be the
        case if one wished to determine the social relations between the interlocutors, in
        connection with use of personal pronouns in languages which do not distinguish
        differences in social status by distinct pronominal forms.

(iv)   In contexts of type (ii), the influence of activity is directly linguistically present
        through utterances in a dialog. The influence of activity can, however, also be non-
        linguistic or perhaps more correctly, linguistically implicit as when the purpose of a
        joint activity or the role relation of speaker and addressee determine the
        communicative function of an utterance. We can characterize this type of context
        as **(- linguistic, + activity)**.

        It is this kind of contextual influence which determines the implicit communicative
        functions in examples 7 and 8 below.

	Role	Utterance	Communicative function
7.	A (teacher): to student during class	what are you laughing at	(stop laughing)
8.	B: (pupil): to another pupil during break	what are you laughing at	(request for information)

The same utterance is used in 7 and 8, but because of the differences in speaker role and embedding activity, can be used with quite different communicative functions derivable from the requirement of role and activity

(v)   Often the contextual influence is more complex and combines all sources of contextual influence. This is, for example, the case when speech act labels are used to assign communicative function. Is the utterance *it's raining* a *warning* or an example of *joyful tidings*? This clearly depends both on the situation and on the lexical meaning of the expressions *warning* and *joyful tidings.* To be a *warning* the utterance must be intended to, or have the effect of, directing an interlocutor to a danger or something unpleasant. To be *tidings of joy,* the utterance must point to something which gives the interlocutor joy. Only by knowledge of the activity at hand, and other non-linguistic circumstances relevant to the interlocutors, is it possible to decide whether either of the labels would describe the communicative function of the utterance adequately.

5.4   Referential content

As mentioned in section 3.4, utterances are put together by various types of **grammatical operations** which determine how the meanings of more elementary constituents are to be put together. Among the most important such grammatical operations are the following: Reference constructing, predication, attribution, coordination and subordination.

Using these operations, a speaker can use language to convey information to his/her interlocutors.

In order to do this, the information must, however, first be broken up into units which fit the scheme of categories made available by the language, which means using **semantic-epistemic** categories like the following, cf. Allwood, 1989.

entities	properties	states
	relations	(courses of) events
	processes	

In a language like English the 4 most elementary semantic-epistemic categories (entities, properties, relations and processes) are primarily made available through parts of speech while the complex categories, states and courses of events, are expressed through different kinds of sentences. The semantic-epistemic categories can, in this way, be made to roughly match linguistic categories in the following manner.

nouns	adjectives, adverbs	sentences
	prepositions, conjunctions	sentences
	verbs	

The **moods** of a language provide certain particular ways of combining the linguistically categorized information through a particular combination of grammatical operations. Compare below example (9) where the entity *door* is referred to and the property/process *open* is related to door through predication, questioning, requesting and attribution.

	Explicit	**Implicit**
(9)		—\
Statement	The door is open	open
		/
Question	Is the door open	open
		\
Request	Open the door	open
		/\/
Exclamation	An open door	open

The effect of the explicit expressions in (9) can, in a particular context where the referent (the door) is salient, also be achieved implicitly by expressing the predicate *open* with different intonational patterns like those indicated in the right column of example (9).

6.   The Structure of a Communicative Contribution

6.1   Four types of information

Let me now turn to how utterances in spoken dialogue (more generally, communicative contributions) are structured. Example (10) provides a point of departure.

Example (10)

A: Did he come
B: <u>Yeah</u>   <u>you can</u>   <u>eh</u>   <u>bet on that</u>
      <u>nod</u>   <u>gaze away</u>

      ICM   **ERM**   **OCM**   **ERM**
              B   **BB**

B's utterance has been annotated with four abbreviations which denote four types of information provided by the utterance.

(i)   **ERM: The Explicit Referential Message** is contained in the words *you can bet on that* which relies on providing information. By using the linguistic categories and

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grammatical operations discussed above. ERM's are what usually is studied in linguistics

(ii)   **ICM: Interactive Communication Management** consists of procedures and mechanisms whereby interlocutors manage their communicative interaction. ICM includes, for example, systems for turn management, feedback and sequencing. In this case, the feedbacker givers *yeah* and the head nod are used to signal perception, understanding and affirmative answer, cf. below, section 6.2.

(iii)   **OCM: Own Communication Management** consists of procedures and mechanisms which enable a communicator to manage his/her own communicative activity online. OCM includes mechanisms for signalling and displaying that the speaker needs time for planning and choice of expressions (such as the hesitation sound *eh* and behavior of the gazing away type) and mechanisms for changing a made contribution in a way that does not confuse the interlocutor.

(iv)   **B: Background information** is essential for the interpretation of any utterance. It consists of the kinds of implicit contextual information discussed above. In this case an interpretation of the word *you* requires perceptual access to who the listener is. The word *that* requires access to the previous utterance and the phrase *bet on* requires access to other activated information which would imply that the speaker feels certain of his answer since one only bets on that which one feels certain about.

6.2   Interactive management

Since the topic of this paper is the structure of dialog, I will now discuss the notion of interaction management a little more in detail. Let us therefore take another look at interactive communicative management functions and attempt to say a little more about them. I will consider three types:

    (i)   sequences
    (ii)   turn management
    (iii)   feedback.

Sequences

Most complex activities can be subdivided in different ways. Such divisions can be made both with respect to an activity holistically (including communication) and more specifically with regard to its communicative aspects (cf. Schegloff and Sacks, 1973). For example, it is often possible to divide an activity into subactivities or topics which in turn can be subdivided into sequences of communicative acts or into sequences of premises and conclusions.

Such units frequently are not merely an analytical tool for a researcher but also have psychological and social reality for the participants in the activity. Thus, they are often connected with mechanisms for:

(i)   initiation (opening, entering an activity, a subactivity or a topic)

(ii)   maintenance (maintaining a subactivity or topic)

(iii)   changing (changing a subactivity or topic)

(iv)   ending (closing an activity, a subactivity or a topic)

The motivation for mechanisms of this type should be fairly clear. In order to achieve the goals of most activities, a decomposition of the activity as a whole into component subactivities will often be necessary on logical, physical and functional grounds. Everything can not be done simultaneously, rather a sequence of partial results which fit into each other is required. Even if in most cases such divisions can be functionally motivated, a subdivision may in some cases be the result of a historically given custom which is no longer clearly functionally motivated. So both historical convention and functional necessity are relevant It is also interesting to consider why communicative interactions are divided into distinct utterances (communicative contributions) and characteristic combinations of these (cf. Sacks, 1975). The basic reason is perhaps that human beings are not rigidly integrated parts of a collective information processing system, but distributed and fairly autonomous information processing agents who have a need for flexible information coordination. However, since there is also a need for a certain rigidity and predictability, this leads to the building up of communicative obligations in relation to certain evocative communicative intentions in certain contexts. For example, you should try to answer questions or you should try to respond to greetings. This, in turn, leads to the existence of fairly stable combinations of speech acts (adjacency pairs) such as greeting-greeting, question-relevant answer, etc.

Management of turns

The next aspect of interactive communication management that we will consider is management of turns. In the present framework, a turn is defined as a speaker's right to the floor. (This definition is slightly different from the classical one given in Sacks, Schegloff and Jefferson, 1974). Turns differ from utterances since one can have the turn without uttering anything. One can also utter something without having the turn, for example to give feedback to a current speaker. Norms regulating the right to the floor are connected with such things as who may speak, about what topic, at what time, how long and in what manner. Activities can vary from allowing simultaneous talk with few restrictions as to topic, time, duration and manner to distribution of turns administered by a specially designated .turn assigner, e.g. a chairman who might impose clear restrictions on topic, time and manner.

Turn management is carried out through a number of subfunctions (for an early description cf. Duncan, 1974), whose verbal and nonverbal expression is often standardized in a way which may also vary with activity and culture. Some of these are:

(i)   Means for assigning turns
(ii)   Means for accepting the turn
(iii)   Means for taking the turn (interrupting)
(iv)   Means for maintaining (keeping) the turn
(v)   Means for yielding the turn
If we reflect on the reasons and motivations for why there might exist ways of managing the distribution of turns, I would like to point to two types of motivation.

(i)   Physical-psychological constraints: there are physical and physiological constraints on human information processing ability. We cannot both send and receive a large number of simultaneous messages. Even sending or receiving two simultaneous messages causes problems. It is also the case that several simultaneous messages may interfere with each other and lessen the probability that any one of them reaches its destination.

(ii)   Requirements of motivated, rational and cooperative communication and need of conventions to support these requirements:

Given the already mentioned physical and physiological constraints on communication, and given rational constraints having to do with communicating efficiently in some activity and ethical constraints (for example, allowing everyone a just chance to both send and receive information) which are relevant for many types of interaction, a system for managing turns is clearly motivated. Since, however, the constraints already mentioned (physical, rational and ethical) still leave many degrees of freedom for how this system should be managed, we may empirically observe that systems of conventions bound to particular cultures and activities have developed. For example, in Swedish and other western cultures, it is much harder to interrupt someone (take the turn) in a formal meeting than it is in an informal meeting.

Feedback

Another aspect of interactive communication management concerns means to ascertain whether your interlocutor is able and willing to continue, perceive, understand and how he reacts to the main evocative intentions of your message. The set of verbal and bodily means which allow interlocutors, in a minimally obtrusive way, to both elicit and give information about these basic communicative functions has been called the linguistic feedback system (cf. Allwood, Nivre and Ahlsén, 1992). As is the case with the systems of turn management, the conventions involved in systems for managing feedback with regard to contact, perception, understanding and main evocative intention vary with culture and activity. So, for example, in informal conversation auditive feedback seems to be more important in Swedish and Japanese conversations than in conversations in the Rio de la Plata area of South America, where visual feedback is more important. An example of activity influence can, for example, be seen in the way a simultaneous "*mm*" (as an indicator of contact, perception/understanding and possibly acceptance) occurs in informal conversation but not in public lectures (in Swedish culture).

The main ways of giving feedback linguistically are the following:

(1)   Bodily   -   mainly head movements

(2)   Spoken   (i)   FB words like *yes*, *no*, *m* with various phonological and morphological operations allowing expansion of these words (for example, Swedish: *ja -> jaa*, *ja -> a* or *ja ->* ingressive *a*)

          (ii)   Repetition of words in a previous utterance to show agreement or to elicit confirmation or more information.

      (iii)   Pronominal or other types of reformulation, e.g. B can agree to
              A's utterance of *it's raining* by saying *it does*.

Languages show different preferences with regard to which means are most often
employed for giving feedback. Some languages are *yes*, *no*, *m* languages like Swedish or
English. Others mainly employ repetition or reformulation like Chinese.

Swedish, for example, exhibits the following FB paradigm, in which the various
expressions can be used with slightly different functional values:

Yes	ja	-	jaha	-	ha
Yes (objection to negative statement)	jo	-	joho	-	ho
No	nä	-	nähä	-	hä
m	m	-	mhm	-	hm
ah	ah	-	aha	-	ha

Many of these functional values would, in English, have to be rendered by the use of
words like *Oh* or *well* in combination with *yes*, *no* and *m*, cf. Heritage, 1984.

If we turn to the reasons and motivations for management of communicative feedback, it
seems plausible that contact, perception and understanding are a sine qua non of one-
way communication while two-way communication also requires reactions to evocative
intentions. Without feedback, in this sense, and ways of managing it, no communicative
activity or system of communication can ever hope to aspire to such properties as
robustness, relevance, adequacy and flexibility.

Feedback systems can also be related to another fairly basic type of management in
communication, namely, the need for ways of managing (repairing, correcting) other
interlocutor's contributions with regard to correctness, relevance, etc. Such reactions to
other interlocutors can be seen as a kind of elaborated feedback governed by various
types of normative considerations.

As for the reasons for this type of feedback, one might say that it exists in order to
provide interlocutors with the means to impose normative constraints (e.g. ethical or
rational) on each other.

7.   Embedding in Activity, Institution and Culture

One of Wittgenstein's basic claims, cf. Wittgenstein 1953 was that the meaning of
linguistic expressions should be analyzed as their use in different language games. In
activity-based communication analysis, Allwood 1995 (or communicative activity
analysis), this claim is further analyzed in the following way:

The choice and meaning of linguistic expressions is seen as a product of the interaction
between an inherent "meaning potential" of the expression and the use it is put to in
linguistic constructions, communicative functions and joint social activities. The use is,
thus, defined in terms of (i) collocations in different types of grammatical structure, (ii)

participation in different types of communicative functions (see section 7.3) and (iii) occurrence in a specific type of social activity.

Let us now briefly consider the notion of a social activity. A social activity can be characterized by the following parameters (cf. Allwood 1980 and 1984):

1.   Type, purpose, function: procedures
2.   Roles: competence/obligations/rights
3.   Instruments: machines/media
4.   Other physical environment

The type, purpose or function of an activity gives it its rationale, i.e., the reason for its existence. So by finding out the purpose, we get at least a vague idea about what means could be used to pursue the activity. I have used two words "purpose" and "function" to indicate that an activity might be pursued for many reasons, some of which are less commonly acknowledged - these latter one might then call functions. The purpose and function have often given rise to procedures which help define what the activity is all about. An activity is also reinforced by the fact that there is a term for it. When we understand terms like "discussion", "negotiation", "lecture" etc., what we understand is mostly precisely the function or purpose of a specific type of activity

One of the means whereby an activity gets pursued, again and again, is by being associated with certain standard activity roles, i.e., standard tasks in the activity which usually are performed by one person. The activity roles can, on the grounds of this association, be analyzed into competence requirements, obligations and rights, where the competence requirement can be seen as a precondition of the obligations. As an example, consider lecturing as an activity. The purpose is something like oral transfer of information in a coherent fashion to a larger number of people. Stereotypically, the activity gives rise to two roles that of the lecturer and that of a member of the audience. The lecturer is obliged to talk coherently on an agreed topic (in which he/she is supposed to be competent) and the audience should listen, at least they should seem like they are listening and perhaps critically evaluate and ask questions.

Instruments and machines also play an important role for many activities and will, if they are used, create their own patterns of communication. For some they are necessary. For others they are more ancillary. Consider, for example, the influence of blackboard, chalk and overhead projectors on lecturing.

Other physical circumstances can also be relevant like level of sound or lighting. If the acoustics are bad, the lecturer will have to raise his voice; if the light is too bright, no overhead-projector can be used, etc.

For most human activities, communication plays an important instrumental role. The nature of this role can vary from being necessary, like in a lecture or a negotiation, to being helpful but perhaps not always necessary. At least, the need for communication might diminish after the basic pattern of the activity has been established, like in garden work or fishing. An activity can, however, be predominantly communicative, like talking in order to relax, even if talking strictly speaking is not necessary for relaxing. In the same way, communication is sometimes necessary like in housing construction, even if housing construction cannot be said to be a predominantly communicative activity.

For both activities and communication, a certain degree of cooperation is essential. In Allwood 1976, it was suggested that cooperation can be analyzed by four conditions (see above section 3.3), each of which is sufficient but not necessary to justify an attribution of some degree of cooperation. Together, the criteria, however, constitute necessary and sufficient conditions for what could be called ideal cooperation.

Communication in itself always involves some degree of cooperation but the degree of cooperation is strengthened by participation in a joint activity. Consider again lecturing. If lecturing is to be successful, the lecturer and the audience must cognitively consider each other, they must also actively work toward the purpose of the activity, which will imply structuring and meaningful content, on the part of the lecturer, and active listening, critical evaluation and maybe note-taking, on the part of the audience. Ethical consideration also plays a role, the lecturer should not waste the time of the audience, not insult them, not make slanderous remarks about other persons, etc., and the audience should not disturb the lecture but generally show courteous behavior. Trust can also play a role, the lecturer trusts the audience to pay attention and the audience trusts the lecturer to be well prepared and to give them correct information, on a level which they are capable of handling.

It is obvious from the analysis just given that the ethical and functional aspects of an activity can strengthen each other. To do what is ethically right in relation to lecturing (or any given activity) is mostly also to do what is functionally desirable or, at least, not dysfunctional.

The strength of the obligations which are generated on ethical, functional and perhaps other grounds, will vary according to circumstances. For example, if there are no text books, or if the lectures cover material not occurring in the text books, but occurring in tests, the functional necessity for note taking increases.

The requirements on the activity rules, thus, include requirements on communication. The different communication roles can be connected with specific ethically and functionally motivated obligations and tasks. For example, in teaching, we expect the teacher to be sincere, to motivate his claims by giving evidence and to take the previous knowledge and general state of fatigue of his/her audience into account. We also expect the teacher to check whether his students have understood and learned, which is one of the things that might distinguish a teacher from a lecturer. Another perhaps weaker expectation is that a teacher should encourage students to ask questions to further their knowledge and to check their understanding. This means that some of the communicative acts which are typical of a teacher are "stating" to describe and explain, "asking questions" to check and control and "making requests" to instruct and control. If we turn instead to the students; they are supposed to listen, try to understand and to some extent evaluate, learn and integrate with previous knowledge. This means that students typically will "be quiet", "listen" and "try to understand and learn". When they are in the sender role, they will "give feedback" to indicate perception and understanding. They will "answer questions" and on a rare occasion "ask the teacher a question" or "make an objection".

In figure 1, below, I will now summarize some of the main features of how dialog is embedded in activity, institution and culture.

NATURAL ENVIRONMENT
Macro Social Institution
Physical Environment of Activity

Social activity
function/purpose

Individual
background

Biological

Psychological
Motives
Values
Attitudes
Beliefs

Social
sex, age
religion
occupation
wealth
education
ethnic
group

Activity role
+ sender role

Individual
sending
activities:
planning &
producing
com. behavior
and action

Instruments
Artefacts of
a) environment
b) activity
c) communication

COMMUNICATION

Activity role
+ receiver role

Individual
receiving
activities:
reacting
apprehending
understanding

Individual
background

Biological
Motives
Values
Attitudes
Beliefs

Social
sex, age
religion
occupation
wealth
education
ethnic
group

Expressive dimensions

Body
Speech   Words
Writing   Grammar

Content dimensions

Background   expressive
info.   evocative
Explicit
Attitudes, ref
content

Interactive dimensions
Sequences
Turntaking
Feedback
Repairs
Rhythm
Spatial relations

**Own communication
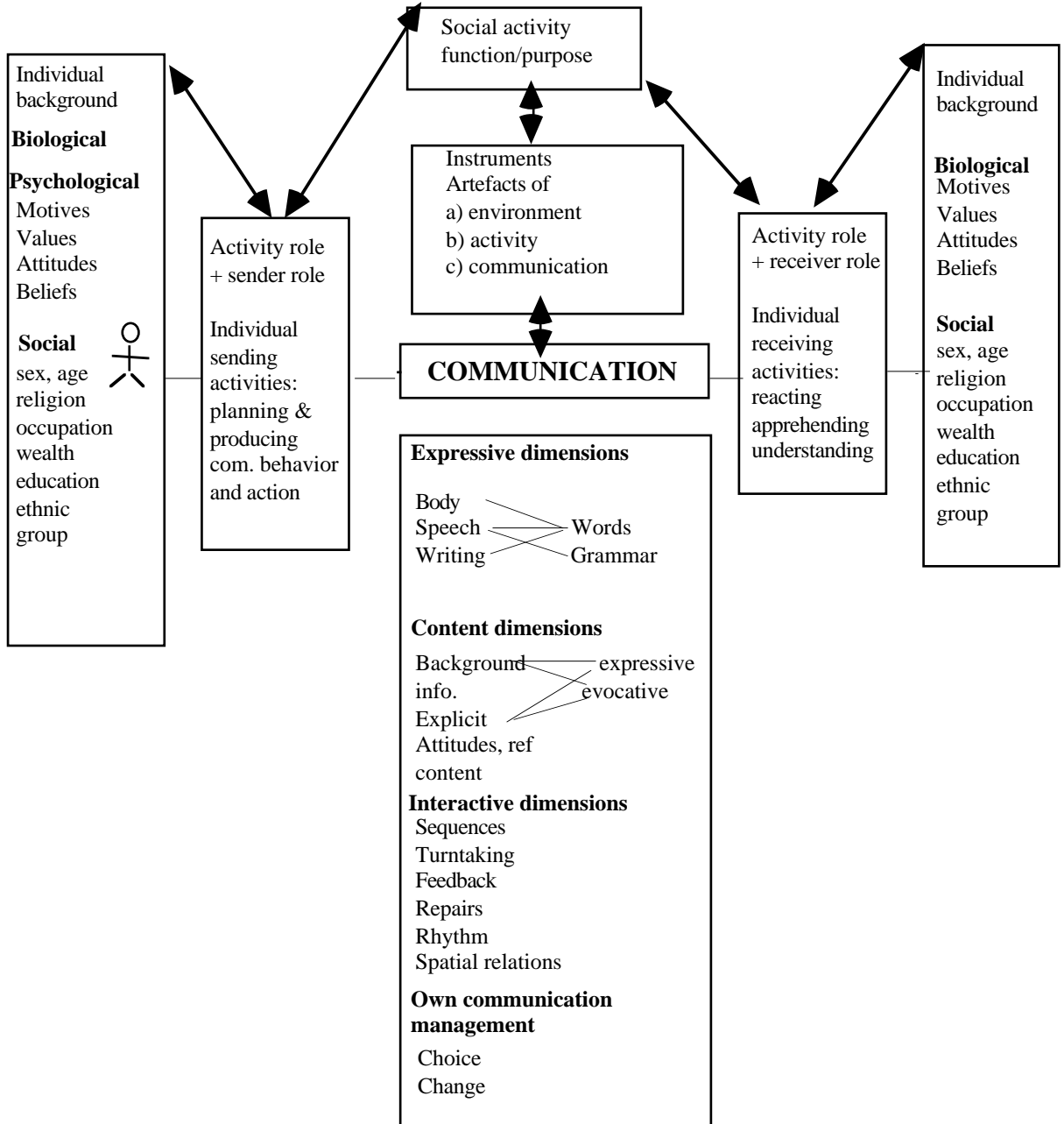management**

Choice
Change

Figure 1. Embedding of dialogical communication in activity, social institution and nature.

8.   Conclusion

I hope this paper, which, when started initially was conceived of as a kind of tutorial, has given a fair overview both of some of the dimensions which contribute to the multidimensionality of dialog and of some of the forces and mechanisms which keep dialog and communication together and have made them into the efficient instruments of human coordinated activity that they are.

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