DIALOGUE DYNAMICS, VIOLIN STRINGS, AND THE PRAGMATICS–SEMANTICS CONTINUUM

Simon Winter

Lund University Cognitive Science
Kungshuset, Lundagård
S–222 22 Lund
Sweden

simon.winter@fil.lu.se

Abstract: The present paper proposes a model of knowledge dynamics in dialogue, applied to expert–novice dialogues dealing with violin-string change. The model works by focusing on breakdowns in the dialogues, where lack of understanding is signaled, and yields a functional stratification of the utterances in the dialogues, and more-or-less distinct levels of instruction, coordination, and verbal labelling. These levels are then shown to correspond to different positions in the continuum between pragmatics and semantics. The analysis also shows a close interplay between information management and social phenomena such as politeness.

1. INTRODUCTION

The main aim of this paper is to make a theoretical contribution to the cognitive analysis of language. The focus is on the intersection between conversation analysis, cognitive science, and semantic theory, but I also report data from a task on expert–novice communication, where violin-playing experts instruct ignorant novices on how to change a string on a violin.

In this perspective, language can be seen as a powerful tool for capturing and transmitting systematic general knowledge that is not *obvious* from the situation at hand. Language is not used mainly to *describe* the world, but in this view rather as a tool for *problem solving*. The words we use are the result of the evolution of socio-cultural practices pointing out problems in our environment. Words have a *reason* for existing.[1]

The *context* of the dialogues is crucial in this connection. The cognitive perspective on the expert–novice setting that I have investigated makes the contributions to dialogue dependent on the *knowledge level* of the other participant.

An expert instructing a novice on how to change a violin string has to *take for granted* some aspects of the task, for example that the string will break if tightened too much, and all the manipulative knowledge that is built up during childhood. Verbal knowledge is often a cue to practical knowledge: a subject who knows the word for pegs, bridge, or tailpiece is supposed to know something more about their meaning.

Thus, verbal and practical knowledge act to reinforce each other, and during the task, knowledge is built up that helps in solving the task. This accumulation of knowledge is however not simply piled up at random, but highly structured (Miyake 1986).[2] A main point of the model I present below is to provide some of this structure, and to present a framework for studying how breakdowns in conversation, due to mismatch in knowledge level, can be analyzed.

1.1. A breakdown analysis of dialogue

A possible cognitive structuring of a task is to see it as a *path in a mental space*.[3] Some parts of the task will be unproblematic, corresponding to a straight path in the mental space. But as soon as there is a

[1]This view can be seen as an extension of relevance theory (Sperber and Wilson 1986). Not only is an utterance seen as "proposing its own relevance." Also, the *words* we use have come into existence because they point to phenomena that are useful to talk about, rather than phenomena that merely "exist."

[2]"What is content at one time becomes context later" (Bullowa 1977:10).

[3]Cf. Sjölander (1997/in press).

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fork or crossroads, the novice will be unsure as to which path to take, and can signal this to the expert, who will provide guidance.[4]

What can then be *said*, if one wants to guide the novice right? In the activity-based perspective of this paper, I will take *instructions*, largely corresponding to phrases in the imperative, to be the basic form for guiding the novice right.[5]

There are a couple of reasons why the pure instructions come to a breakdown. One is the lack of understanding that arises from a mismatch of the mental representations of the expert and the novice. In the setting of string-change that I have investigated, the participants are separated by a screen, and there often arises a need for this form of *coordination*.

Another reason for breakdown that arises both in the instructions and in the coordinations is that the *words* used are not understood by the other participant.

These functional levels, of *instruction* (request for action, A), *coordination* (C), and discussion of linguistic *labels* (L), form the basis of the model presented in section 3.

The view of language that I present is chosen to be able to focus on *cognitive* aspects of language: language as a means of packing knowledge together in a form convenient for transmission, i.e. words. But I will also briefly mention the stabilizing properties of language, and discuss some social aspects of language, mainly some politeness and face saving phenomena (section 4.1).

2. THE DIALOGUE SETTING

In this paper, I use data from a series of dialogue recordings with "experts" acquainted with violins and violin playing, and "novices" who have no such knowledge, paired together, with a screen between them so that they could easily talk but not see each other. The task for the expert was to tell the novice how to change the E string and tune the violin.[6]

In doing this, my subjects produced a manageable quantity of linguistic data that I recorded and transcribed, for the purpose of doing an analysis on a *cognitive*, information-processing level.[7]

The English translation, enclosed in single quotes, is near word-by-word, but should be comprehensible by a native English speaker. This is to avoid the double translations used in many linguistic contexts.

The instructions to the subjects were limited to a minimum, and they were not told anything about the nature of the task in advance. When they had taken their seats, the experimenter handed the violin and the supplementary string to the novice telling them: "The task is for you (addressing the expert) to give instructions to you (addressing the novice) about how to change the E string on this violin."[8]

The advantage of a screen separating the two subjects is that, as a consequence of the lack of coordination by gesture and gaze, it amplifies the effects of the model that I propose. A conversation under more natural circumstances will contain much fewer breakdowns that are due to faulty coordination (and differing vocabulary).

2.1. Why do I let people change violin strings?

The first reason for choosing this task is that it is *practical*, takes place in a *situated* context, and uses *external representations*, although the context is slightly manipulated by the presence of the screen, forcing the expert to take part only through the mediation of the novice.[9] It is easy to imagine a violin novice getting telephone instructions on how to change a string for the first time when he[10] is at home practicing and the string breaks or is damaged.

Second, handling a violin is difficult and risky for the novice. A violin is a fragile thing, and the E string is likely to break if not treated with caution. This will prevent the novice from proceeding too far ahead of the expert's instructions. As the process starts with removing the old string, and the replacement in many respects is the mirror of the removal, this is an obvious risk: there is a lot of information available in the context. And, of course, many inexperienced people would actually just change the string reasonably well if it were necessary and if no one were there to give instructions.

Third, the difference in linguistic competence is crucial for the analysis I have attempted. Violinists

[4]There is also the more problematic case where the novice will not notice that he has gone down a side track, and the expert must in these cases have a certain *anticipation* of the course of the task to be able to correct the novice (Winter 1996).

[5]There is also a close relation between gestures and instructions. In cases where *pointing* can be used in instructing a novice, the gesture is never purely descriptive, but always has an imperative connotation: "*Do* something there!" Also Childs and Greenfield (1982), quoted in Cole (1985) seem to regard imperatives as basic in expert–novice tasks.

[6]The three experts were amateur violinists in a student orchestra, and the three novices were people with no hands-on experience of bowed instruments. The reader is referred to Winter (1996) for more details concerning the setting and the data.

[7]The level of transcription is adjusted to the level of analysis, and the transcription might seem rather coarse compared to most linguistic work, but the coarser the transcription is, the more readable it will hopefully be.

[8]This was to confirm the status of the expert, and to avoid "lone riders" performing the task on their own. It is reasonable to expect that other instructions would have skewed the distribution of the data.

[9]For references on situated cognition, see Suchman (1987) and Lave (1988), and on external representations, Hutchins (1995) and Zhang (1997).

[10]To facilitate pronominal reference, experts are always female and novices male in the text (but not in the real dialogues).

have access to a small specialist vocabulary. It is acquired in early years, consists of around ten terms, and is not more unusual than that it can be found in many bilingual dictionaries.[11] The most common terms are shown in figure 1.

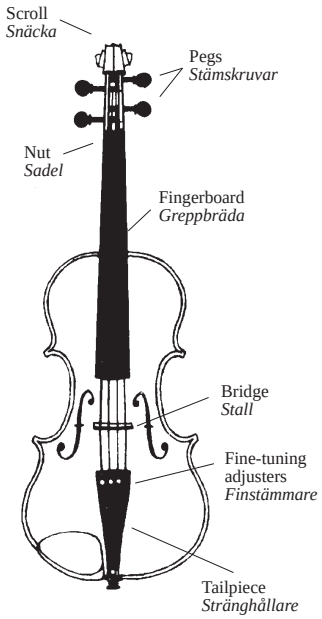

Figure 1. Violin vocabulary.

Furthermore, there are some nonscientific advantages to the setting that I appreciate. It is a low-cost experiment leaving the subjects with a rather high degree of satisfaction.

2.2. The course of events

To give a hint of what is going on in the dialogues, I want to provide a very brief account of the course of events common to all the subject pairs.[12]

To be able to mount the new string on the violin, it is first necessary to remove the old one. After this, the new string is fixed at two points: at the end of the bridge, where a small ball is inserted into a kind of fork, and at the scroll end, where the other end of the string is introduced into a hole in the peg, and the peg is rotated clockwise to tighten the string. While doing this, there are several points to observe: the small ball must not fall out of the fork; there is a small plastic tube on the string that should be fixed on the bridge; excessive tension on the string will make it break; the peg is not threaded into its hole, but only wedged, and thus might lose its grip; and so on.

3. A MODEL OF DIALOGUE DYNAMICS

In the rest of this article, I will focus on the following functions of language use:

* Language is used to capture *nonobvious* features of our environment. The nonobvious features that are candidates for coding in language are the ones that are important for our socio-cultural practices. Language use is a kind of problem solving.

* Language is used to counter the *expectations* of the addressee. More specifically, in the expert–novice dialogues, language is used to direct the novice from the start to the goal in the task. When it is clear how to proceed, language is not needed. The need arises at a fork on the mental path of the task.

* In the verbal output, there are *three functional levels* to be found. The first is the level of instructions, the second is used when the instructions are not clear and consists of utterances to coordinate the mental representations of the participants, and thirdly the level of linguistic labels is employed when discussing the meaning of the words that are used.

To accommodate the data given these theoretical inclinations, I present a more formal model over the following sections, distinguishing the two kinds of *substantive* and *regulatory* utterances in section 3.2, and giving some quantitative aspects of the data in section 3.3.

3.1. Model dynamics

Figure 2 shows the central model of this paper, based on the "tip-of-the-iceberg" metaphor, mainly to indicate decreasing proportions of the higher levels due to the *ease of information exchange* at the lower levels. The rest of the paper will be devoted to the relation of this model with the data, and some theoretical elaboration of the model, e.g. mapping the model to the continuum between pragmatics and semantics.

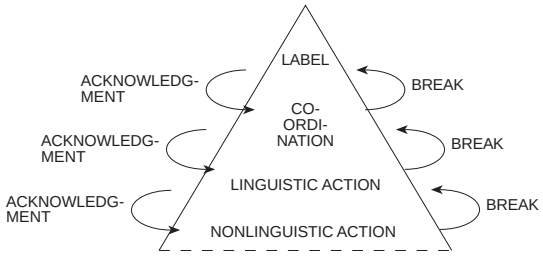

Figure 2. Dialogue dynamics

The bottom level of the model, shading into the complexity of the external world, represents the socio-cultural *practices*, and the dashed line indicates its close connections with the parts of the world over which we only partly exert control. In the dialogue, the actual changing of the string takes place at this level. One immediate difference between this level and the other levels, is that while the practical action can take place during the conversation, the three verbal levels are mutually exclusive in time – parties to a conversation do not in general talk simultaneously.

[11]Referring to my own experience.
[12]See Winter (1996) for an elaborated version.

On the level of *linguistic action*, we find the basic level of instructions – direct *requests for action*. This level is reached by a *break*, signaling uncertainty at a lower level.

Request for action (A):

A 2.42. (E) ja men i varje fall sätt fast den där du tog loss den sist
(E) 'yes but anyhow fasten it where you took it away last time'

Break (B):

B 3.31. (N) oj
(N) 'oops'

To signal completion on a level, or rather a generic agreement, speakers use signals of *acknowledgment* (see below). There is a form of *gravity* in the model, so that energy in the form of verbal content will be needed to move *upwards* in the hierarchy, while only minimal effort (or no effort at all) will be needed to reach the lower levels.[13]

Lack of understanding at the level of linguistic action brings us to the level of coordination, where the mental models of the participants are coordinated.

Coordination (C):

C 1.179. (N) så, nästa sträng ligger ju i... in under där liksom
(N) 'so, the next string lies i... in under there sort of'

When lack of understanding of the labels used in the dialogue is signaled, the conversation moves to the level of labels. The specialized vocabulary of violins is likely to generate such breaks, if the expert is not cautious as to the knowledge level of the expert.

Label (L):

L 2.18. (N) finstämmare vet ja inte va de e
(N) 'finetuning screw I don't know what it is'

At each level, agreement is signaled with acknowledging phrases, such as 'okay', 'uhuh.' These signals allow a transition to a lower level, where the conversation can (ideally) resume at the point where it was interrupted by the break.

Acknowledgment (=):

= 3.42. (N) mm
(N) 'mm'

To sum up:

• There is "gravity" in the model: the stable state is on the lowest level, where the nonlinguistic actions take place. As long as everything proceeds as expected, the participants can do without talking.

• When something isn't clear, a participant can signal this. It can be done e.g. with a question or an exclamation, and these are marked "break" in the figure. Then the conversation moves to the level of linguistic action. On this level we find the instructions that are directly relevant to the task. The immediate context of this level is the lower level of nonlinguistic action.

• If the *instructions* are unclear, the participants need to *coordinate* their representation of the setting and the task. On this level we find questions about relations between different parts, about what the participants see, etc.

• Sometimes, the participants do not have the field-specific *vocabulary* in common, and this is handled on the label level.

3.2. Substantive and regulatory utterances

The dialogue items can be separated into two groups, following the categories of intonation units of Chafe (1994). Requests for actions, coordinations, and labels pertain to the *substantive* contributions to discourse, while the function of breaks and acknowledgments is mainly *regulatory*. They steer conversation through the model.

While the substantive utterances are of a specific character for each level, the regulatory ones are more generic, which gives great flexibility to conversation. For example, if the participant signals acknowledgment on one level, conversation should theoretically resume at the lower level at the break point. However, memory requirements are heavy for such a push-and-pop strategy, and lower requirements on the meaning of acknowledgment will yield more flexibility in the dialogues. Also, the knowledge expressed by breaks and acknowledgments is not *certain* knowledge. Often, the participants "do not know what they do not know," but rather signal a general uncertainty that is interpreted – correctly or incorrectly – by the other party.

It might also be that an explanation on e.g. the label level fulfills the double purpose of explaining the signification *and* coordinating the mental representation of the state of affairs, as in 3.159, where the meaning of the "low string" is questioned in 3.158, and the answer given both establishes the convention for "low" *and* lets the novice fulfill the request in 3.155.

A 3.155. (E) spela A en gång
(E) 'play A once'
3.156. [N knäpper på E-strängen]
[N plucks the E string]
BC 3.157. (E) alltså den låga
(E) 'I mean the low one'
BL 3.158. (N) den låga?
(N) 'the low one?'

[13] Another way of viewing the dialogue dynamics is as conversation proceeding in different *gears*, as pointed out to me by Per Linell (pc).

=L 3.159. (E) ja alltså den.. andra strängen liksom
(E) ‘yes, that is, the.. second string sort of’
3.160. [N knäpper på A-strängen]
[N plucks the A string]
A 3.161. (E) å så Eet..
(E) ‘and then the E..’

There is a close interplay between the breaks and the judgment of the knowledge level of the other participant. An expert that correctly judges the knowledge level of the novice will be able to keep the conversation at a low level. On the other hand, this could involve the total exclusion of specialized vocabulary, which in general makes reference more precise and condensed. Thus, there seems to be no easy way to correlate communicative efficiency with the conversation level alone.

I have allowed multiple tags in the utterances. It turned out that utterances often contain one regulatory part and one substantive, but not more than one of each.[14]

3.3. Moving around in the model

To illustrate the kind of dynamics that we get in the dialogues, I give some longer excerpts. First, a “typical” section with interwoven substantive and regulatory utterances. Observe the anticipation in 3.21, where the novice asks for the significance of a detail of the string. This thread of the dialogue is forgotten after the removal of the string in 3.23.

A 3.12. (E) och.. då lossar du den
(E) ‘and.. then you loosen it’
[3 items omitted]
B 3.16. (N) ska jag lossa den helt?
(N) ‘should I take it off completely’
= 3.17. (E) jaa
(E) ‘yees’
C 3.18. (E) ... å så är den ju instucken i ett litet **hål** där..
(E) ‘... and then it’s inserted into a small **hole** there..’
= 3.19. (N) mm
(N) ‘mm’
A 3.20. (E) så de e bara å slita loss
(E) ‘so it is just to be torn away’
BC 3.21. (N) de e nån förstärkning där runt om också
(N) ‘there’s some reinforcement round it too’
= 3.22. (E) mm
(E) ‘mm’
3.23. [unwinds the string]
BC 3.24. (E) får du loss den?
(E) ‘can you get it off?’
=C 3.25. (N) mm.. jag tar de lite försiktigt bara
(N) ‘mm.. I’m just taking it carefully’
= 3.26. (E) mm
(E) ‘mm’

In the following excerpt, the novice tries to communicate effectively on the action level, using a generic verb ‘do’ and a pronoun ‘it.’ These are both underdetermined and the novice signals by a break, and in 1.158, the expert explicates the matter so that coordination is re-established. The novice signals two levels of understanding.

A 1.156. (E) då gör du till vänster om den
(E) ‘then you do to the left of it’
B 1.157. (N) ...vad är de jag ska göra till vänster om vadå alltså
(N) ‘...what is it I should do to the left of what, do you mean’
C 1.158. (E) du ska llägga den strängen som du lindar upp.. ska du lägga till vänster om den utstickande stumpen
(E) ‘you should pput the string that you wind up.. you should put to the left of the end that’s sticking out’
= 1.159. (N) ... jaha okej
(N) ‘... uhuh okey’
= 1.160. (N) m.
(N) ‘m.’

In fact, the version of the model that I gave above is a bit simplified, and the actual conversations more flexible. For example, it is also possible to pass directly from either of the lower levels to any of the higher.[15]

As I said above, there is *gravity* in the model, and in the absence of clear signals to a higher level, conversation will continue at the lowest possible level, which is often the level of silent action.

3.4. Quantitative aspects

Although the empirical material is far too limited for statistical treatment, as is the case in most qualitative studies,[16] I want to show the distribution of requests for action (A), coordinations (C) and labels (L) over the dialogues. (The regulatory utterances are treated separately below.)

[14]Cf. the coding in Linell et al. (1988). Reducing the units of transcription to “intonation units” along the lines of Chafe (1994) would not solve the problem of multiple tasks, as the tag border would not correspond to the border of an intonation unit. Allowing several tags per utterance also makes the results less sensitive to transcription conventions.

[15]Olson (1988:125) discusses the differences between “What do you mean?” and “What does it mean?”, where only the second question in my analysis would be a break to the Label level. Olson notes that the emergence of questions like “What does *it* mean?”, referring to the linguistic system in an impersonal way, is closely connected to the advent of *literacy*.

[16]E.g. Miyake (1986) who investigated a similar setting.

The distribution of the different tags is given as proportions of the number of total tags in the graph.

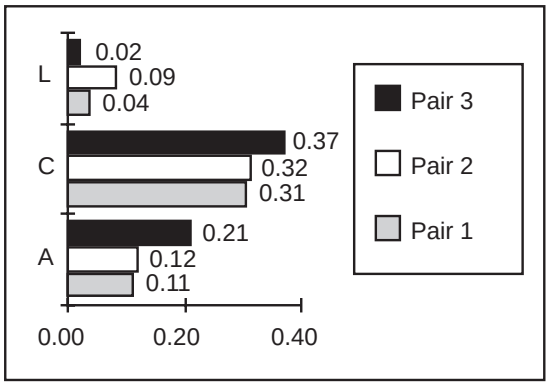

Figure 3. The distribution of substantive utterances.

I proposed the model as a tip-of-the-iceberg figure, which implicitly predicted a distribution with decreasing proportions from A to C to L. This is clearly not the distribution obtained in Figure 3. However, as discussed in section 4, there is nevertheless reason to keep the model as an illustration of the kind of dialogue dynamics based on expectations that I outlined in the Introduction.

The proportions of regulatory utterances are calculated in the same way, and given in Table 1. Acknowledgments are roughly twice as common as Breaks.

Subject pair	Break (B)	Acknowledgment (=)
1	0.17	0.36
2	0.15	0.33
3	0.17	0.22

Table 1 shows the distribution of regulatory utterances.

4. Discussion – Consequences of the model

The model I propose in this paper only covers one of the functional layers that are active in dialogue, a level of knowledge management, and in section 4.1 I show how the unexpectedly large proportion of coordination items can be explained with reference to politeness and implicature phenomena. In section 4.2, I give a reinterpretation of the status of linguistic labels, in light of my discussion. Section 4.3 shows the relation between my model and related theories.

4.1. The role of coordination phrases

The tentative quantitative analysis of the dialogues above revealed a distribution toward a general preference for coordination utterances over regular instructions. How is it possible to explain this skewed distribution?

One explanation is that the screen between the two participants makes verbal coordination necessary, instead of the coordination by gesture and gaze that would otherwise be natural. Thus, the screen will enhance the upper levels of the model.

The main explanation seems however to lie in the fact that imperatives and the declaratives used in coordinations form a *continuum*, and that imperatives are much more "face threatening," in the vocabulary of Brown and Levinson (1978/1987). Thus, declarative coordination phrases are used, which in many cases work *as imperatives* by way of conversational implicature.[17] Let us take a closer look at this.

Givón (1989) has elegantly shown the continuum between the moods of imperative, declarative and interrogative. An example is given below.

> *most prototypical imperative*
> a. Wash the dishes.
> b. You better wash the dishes.
> c. You might as well wash the dishes.
> d. I suggest you wash the dishes.
> e. It would be nice if you could wash the dishes.
> f. It would be nice if someone could wash the dishes.
> g. The dishes need to be washed.
> h. The dishes are dirty.
> i. The dishes were dirty.
> *most prototypical declarative*
> (Givón 1989:154)

He tentatively proposes dimensions that underlie this continuum:

> (39) a. The *power (authority) gradient* between speaker and hearer [...]
> c. The degree of the *speaker's sense of urgency* or *determination* vis-a-vis the attempted manipulation [...]
> (41) a. The speaker's *subjective certainty* of the information
> b. The speaker's assessment of the *hearer's ignorance* of that information
> c. The speaker's assessment of the strength of the *hearer's motivation* to learn that information
> (ibid:154–155)

One way that this shading from declarative to imperative is expressed in the dialogues is when the expert pictures a desirable goal state, or a future state of affairs, for example introduced with a *when*-clause, as in 1.88.

C 1.88. (E) ..och när du sätter i kulan ska du ha **hålet**...till höger och vänster

[17]This of course raises the methodological problem of the tagging of the utterances. I have tried to base the tagging on the linguistic form rather than the function.

(E) '..and when you introduce the ball you should have the **hole**...facing right and left'

In Brown and Levinson (1978/1987), the authors introduce the notion of *face* and *face-threatening act*. It is important not to challenge the face of interlocutors by challenging competence or intruding on the other's personal integrity zone. One way of doing this would be to describe the situation from an impersonal point of view, rather than using imperatives that have a more direct impact on the actions of the other.[18]

The process by which coordination phrases acquire the status of imperatives is conversational implicature, in the sense of Grice (1975). Observe that this kind of implicature works *downward* in the model, so that coordination phrases by implicature acquire the function of imperatives, and imperatives by a similar convention gain relevance for the level of nonlinguistic action.[19] According to this view, there is no important difference between nonlinguistic and linguistic action.

A third reason for the amount of coordinations could be that language in many settings functions as a *stabilization* and *monitoring* of practical activities. Especially for novices, it is difficult to judge the knowledge level of the interlocutor, and the effort to provide some extra context is low, since talk and practice can be simultaneous.

If imperatives are so face-threatening, how come we find any imperatives at all in the dialogues? Apart from the factors outlined by Givón, the possibility of *transferring responsibility* (Rogoff 1990) is relevant for the present task:

As I said, many coordination phrases consist of the expert describing a desirable goal state, and then leaving it to the novice to fulfill this goal on his own, thereby reducing the intrusions on the novice's personal integrity. However, there are some cases where the novice does not have enough competence to judge when the goal state is reached, for example at the end of the dialogues, when the violin is tuned. There, the frequency of requests for action (A) is higher than in other parts of the dialogues.[20]

4.2. Labels

An expert–novice setting raises many questions in relation to the vocabulary used. The specialized words that experts possess, such as *bridge*, *pegs*, or *tailpiece* have a double nature. On the one hand, they are shorthand labels for referring to delimited physical objects – i.e. their extension is easy to determine. On the other hand, the *raison d'être* of these labels is not that they *point out* these objects, but because the objects are involved in a problem that is solved or at least illuminated by the socio-cultural practices that accompany the use of the word – i.e. the intension, or conceptual content, associated with the word is much richer than merely referring.

The *meaning potential* of concepts seems to be of crucial importance for understanding the dynamics in this kind of interactions, but seems to be a problem that is hardly investigated at all.[21] In my view, the possibility of basing reference on extension can function as a bootstrapping mechanism for the process of conceptual development in line with the "zone of proximal development" (Vygotsky 1978). In the case of the novice, the extensional use of a label is meaningful because of the presence of external context.

Another issue raised by the word use in the dialogues is the strategy of selecting a verbal level: efficient references make use of words that are specialized for the purpose that has created them! On the other hand, the novices do not a priori know these purposes, and it is hard for them to predict which parts of the violin have specialized labels.

In Winter (1996) I introduced a choice between two kinds of strategies that I, perhaps misleadingly, called *anticipatory* and *opportunistic*. The distinction builds upon the assumption that in repeated use it is efficient to be able to employ the task-specific vocabulary, while on a single occasion, the embedding of a label that is unknown to the novice, in the context of, say, a request for action, is likely to generate a break that could seriously delay the course of instructions. On the other hand, it could be that trying an opportunistic strategy at a higher knowledge level, i.e. taking more context or word knowledge for granted, would turn out to be successful, i.e. not generating any breaks.

4.3. Related work

The aim of the model proposed above is to cast new light on the mechanisms of *information management* in discourse, the relations between the *knowledge* coded in verbal expressions and the practical knowledge expressed in action, the role of *expectations* for determining linguistic meaning and the relations between *pragmatics* and *semantics*.

The theoretical framework proposed is largely compatible with the socio-cultural framework of

[18]In this context, it must be noted that also an explicit discussion of verbal usage, what I have called label (L), is a face-threatening act, in that it is a potential challenge of the verbal competence of the other participant.

[19]This is not to my knowledge discussed in the literature.

[20]Luckily, the expert was able to hear the pitch of the string while it was being tuned. A different setting where the novice would have to *describe* the current state to the expert would have been much more complicated for the pair to handle.

[21]However, see Allwood (n.d.), Næss (1953) Rommetveit (1974; 1985).

Vygotsky (1934/1986),[22] stressing the role of social practices taking the form of language, although the analytical primitives I have chosen to build up the argument does not stem from this school of thought. The reason for this is the necessity to integrate the present framework with the current discussion in cognitive science broadly defined.

The expert–novice setting I have used for the empirical parts is related to a number of studies (Hutchby 1995; Isaacs and Clark 1987; Patthey 1991; Patthey-Chavez 1994, among others). These have, however, a strong sociological bias, and are hard to relate to the information management perspective of the current model.[23]

The social and sociological bias is also strong in the tradition of Herbert Clark (1992; 1996), who is concerned with the *joint contributions* to discourse, and the school of Robert Krauss (Krauss and Fussell 1990; Krauss, et al. 1995; Krauss and Glucksberg 1977), who is interested in expectations of participants' knowledge levels in discourse, e.g. based on membership in social groups.

Much closer is the tradition of constructive interaction (Miyake 1986), where a pair of subjects jointly performs a task. An important difference is that constructive interaction settings most often involve two subjects that are as *similar* as possible, while much of the dynamics of the present model build upon cognitive differences between subjects.

The expectationist framework that I propose is also closely connected to the analysis of *initiatives* and *responses* in Linell and Gustavsson (1987) and Linell et al. (1988). (Cf. also Winter (1996).) In relation to their model, my model may be said to provide another dimension – the explanation of *why* some initiatives are more likely than others, i.e. as a response to the uncertainty generated at each level of the model.

5. FROM PRAGMATICS TO SEMANTICS

The functional levels of the model I propose bear a relationship to the linguistic functional realms of pragmatics, semantics, and syntax, and I would therefore like to give a reinterpretation of these from the activity-oriented perspective of the present paper, and then to give a tentative mapping from my model to the continuum between pragmatics and semantics.

For linguistics, the delimitation of semantics from pragmatics important.[24] As Linell (1982) points out, "[m]any linguists have been quite anxious to establish and maintain linguistics as an independent science distinct from, say, psychology, sociology and philosophy." As a consequence of this, a dichotomy between dictionary and encyclopedia is postulated, where the dictionary is supposed to contain the fully conventionalized linguistic sign, and the encyclopedia all the unorderly world knowledge. Semantics is then only concerned with the dictionary, and the encyclopedic knowledge is relegated to the "pragmatic waste-basket."

One underlying assumption in traditional linguistics is that determining the meaning of words is unproblematic. It is possible to establish the meaning of a word from an *objective* perspective – the perspective of the *language system*. The speech community is supposed to share this meaning, and meaning resides in language.

These scientific divisions of the analyzed field have of course justifiable historical roots. To study language, it was necessary in the beginning to focus on the written word, since it was not possible to treat the spoken word as a scientific object of study before the age of sound recordings.[25] Language was treated as a self-contained system, and the meanings of words were traditionally expressed by other words.

This view remains unproblematic in the presence of someone to interpret language – traditionally the linguist.[26] However, when for example the ultimate aim of the analysis is to construct an *artificial system for language understanding*, then the interpreter has to be *included* in the system. The claim of semantic context-independent meaning always implicitly presumes at least the context of a human interpreting the language.

What then would a cognitive view of language built upon the function of language as reflecting socio-cultural activities predict about the relations between pragmatics and semantics? The socio-cultural perspective is more in accordance with the view of Ronald Langacker, that "semantics is conventionalized pragmatics" (quoted in Givón (1989:323), see also Langacker (1987:154–166)).

Passing from pragmatics to semantics corresponds to gaining some kind of systematic knowledge of the pragmatic level (Givón 1984). A child exploring the world learns about physical and social properties that are related to its emotions and motivations and thereby have meaning for the child. The generalizations built up without language are complemented with verbal labels, to give a hint of where the language community finds meaning.

Shifting the focus from "meaning-in-language" to "meaning-in-action" also facilitates the analysis of semantic *conventions*. Calling two different instances of chair "chair" does *not* tell us anything metaphysical about the meaning of the concept chair, but is

[22]See also various contributions in Wertsch (1985).
[23]Cf. also the school of Harvey Sacks and co-workers (Sacks and Schegloff 1979; Sacks, et al. 1974).
[24]See Lyons (1977), Levinson (1983), and the discussion in Linell (1982).
[25]It has been pointed out to me that no oral culture has developed a formalized grammar. Written language is a prerequisite for the analysis of language.
[26] Cf. the semiotic notion of interpretant, stemming from Morris and Peirce (Eco 1984; Givón 1989).

only a hint that the *same kind of meaning* can be found in *interacting* with the two objects.

The *modal verbs* constitute an area where this kind of conventionalization of pragmatic meaning has been studied. Winter and Gärdenfors (1995) showed that it was possible to describe the Swedish deontic modal field in terms of social categories, in this case the social power relations in the situation together with the speaker's expectations of the others' attitudes toward the action that the modal modified. Thus, some of the pragmatically conventionalized attitudes found in everyday interactions find their way into the language system, coded as modal verbs. The analysis of the modal verbs also shows that this kind of conventionalization continues into the realm of morpho-syntax.

In fact, if the context-independence is growing from pragmatics to semantics, this is also the case from semantics to syntax: whichever Swedish noun and verb we take, changing the word order from noun–verb to verb–noun will convey the semantic change from indicative to interrogative *regardless of the context of use*. In some sense, information conveyed by word order (and intonation contours) is *parasitic* on the words themselves – it doesn't add to the *amount* of information, only restructures the words to get the information through.

In relation to my model, a level of dealing with syntactic knowledge could be expected, corresponding to the semantic level of Labels (L). Syntactic knowledge, however, can be said to be presupposed for the verbal interaction to take place at all. Thus, challenge on this level is very unusual, but could take place for example between two individuals with differing knowledge of the language spoken.

5.1. Mapping the model to the pragmatics–semantics continuum

The different levels of the model presented above help to maintain and reinforce different parts of the continuum between pragmatics and semantics. The processes I discuss here concern the *explicit* reinforcement of conventions. For example, when establishing the meaning of a word in everyday discourse, the meaning is most often *not explicitly negotiated*, but rather inductively determined by each party from the context of use. In the case of these dialogues, however, utterances that I have tagged as Label (L) directly concern these linguistic conventions, and thus pertain to the semantic end of the continuum.

At the other end of the scale, instructions (A) directly concern the proper way of performing the task (from the expert's point of view), and thereby reinforce the conventions that are tied to the particular context of use, i.e. to the practical and pragmatical conventions.

The utterances that I have tagged as Coordination (C) occupy an intermediate position. They can be said to coordinate our "mental models." In current cognitive semantics, the mental model is often taken as *replacing* reality as the entity against which we judge the applicability of a word (Gärdenfors 1997). For example, in traditional semantics, the word *horse* is connected to the set of all horses in the world surrounding us. Cognitive theories have, however, contrasted this view against a version where a word *horse* would be applicable if it corresponds to a certain mental model.

However, this view raises some problems. One is that intersubjective agreement is impossible to reach only from coordination of mental models in the heads of the participants. This coordination is always mediated by practical activities. Another problem is that not only the coordination, but also the construction of the models is mediated by practical activities (Piaget 1968/1970; Vygotsky 1934/1986; Vygotsky 1978). The surrounding reality puts *constraints* on the possible mental models that we can maintain.

Thus, Coordinations are created by the tension between internal and external representations. The following excerpt is an example of how coordinations alternate between taking internal or external representations as a basis. The setting is at the time for tuning the violin, when the string is in place, but the pitch still too low. The Novice is instructed to pluck the replaced string, and in 3.101, the sound of the string is the common ground for questioning if it is the proper string that is being plucked, as the sound of the string does not seem to fit with the Expert's mental representation of it. Here, the Expert makes reference to the external *sound* as a presupposed background fact to use for building up her mental representation. This background fact can not be challenged and at the same time provide the context for coordination.

A 3.100. (E) aa spela lite på den så
(E) 'aa play a little on it then'

BC 3.101. (E) e de den strängen som du spelar på nu..
(E) 'is that the string that you are playing on now..'

= 3.102. (N) mm
(N) 'mm'

A 3.103. (E) nej men mycke hårdare
(E) 'no but much harder'

C 3.104. (E) ... de ska låta som ett E! heheh
(E) '... it should sound like an E! heheh'

3.105. [N plucks the string]

B 3.106. (N) jag har inte en aning om hur ett E låter
(N) 'I have no idea how an E sounds'

In 3.104, on the other hand, the Expert tries to use "the sound of an E," i.e. a reference to an *internal* representation, as common ground for *instructing* the Novice. This does not work, of course. Had the

Novice known the correct pitch, he would have tuned the violin without the interference of the Expert.

Thus, the intermediate position of Coordination utterances consists in that they must rely on *either* internal or external representations as a common background assumption. Their function is much less normative than both instructions and utterances concerning verbal labels. Subjects use internal representations (expectations of how it should be) to change the course of events (the external reality), and external representations (sound, images) to update their internal expectations.

6. CONCLUSION

To conclude, I would like to give a very brief summary of the main points in the paper.

• I have pictured a view of language built on expectations, and closely connected to real-world activities. The question of meaning and meaningfulness is transferred from language to these activities. Language is a tool for capturing and transmitting general, nonobvious features of our environment.

• In this view of language, verbal utterances are signs of breakdown in the information processing of the individual. These breakdowns form different levels depending on what aspects of the situation are challenged.

• The empirical setting of the paper is expert–novice dialogues. In these dialogues, we find a basic level of verbal instructions, when the task cannot proceed without verbal intervention.

• The next level, when the instructions fail due to lack of correspondence between the mental models of the expert and the novice and the "real world," consists of coordination utterances to re-establish this correspondence. If the vocabulary used in instructions or coordinations is not clear, this is handled on the top level of the model.

• A quantitative analysis of the data yields an unexpectedly large share of coordination utterances. This is explained by (1) the presence of a screen between the subjects to hinder coordination by gesture and gaze, and (2) politeness phenomena. Coordinations are much less face-threatening than instructions and utterances challenging verbal competence.

• The utterances on the different levels have bearing on different levels of the continuum between pragmatics and semantics. Instructions (A) reinforce practical conventions by explicitly formulating how to proceed in the task. Utterances concerning the meaning of words (L) reinforce semantic conventions. While instructions rely heavily on the comprehension of words, and utterances concerning verbal meaning rely on knowledge of the situation at hand, coordination phrases occupy an intermediate position, borrowing support from both internal and external representations.

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Figure credits: 1. Drawing by Mårten Belin.

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