

PROSODIC STRUCTURES AND DISCOURSE ORGANIZATION

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ABSTRACT

In this paper we examine how topic organization and discourse interaction are manifested in the intonational structure of a discourse. Topics are hierarchically organized to indicate the topic relationships between phrases. Patterns of intonational convergence and divergence in intonation arise naturally from the cooperative working out of discourse processes.

Introduction

In spontaneous discourse, intonational patterns of phrases are a critical component in conveying the coherence of topic development and the salience of communicated information between participants. Topic structure and discourse interaction are integral and inseparable parts of discourse organization, as participants cooperate and interact to achieve a mutual development of the conversation. The pitch level structuring of each phrase relative to other phrases through systematic patterns of downstepping and upstepping signals the coherence relations among phrases.

Downstepping and topic development

Examination of the pitch movements in the dialogue shows that discourse is hierarchically organized by intonation. In my data, dialogue, episodes and topic initiations often begin with a high pitch level or expanded pitch range, while endings are marked by a low pitch level or narrowed pitch range. The direction of pitch level movement is frequently downward.

Downstepping between phrases usually occurs when there is a natural elaboration of topic ideas which move towards a resolution. This process can be seen as progressive movement away from uncertainty, with each subsequent

phrase closer to a final resolution. The degree of step lowering represents the degree of completeness and finality of the phrase relation in the topic hierarchy. Figure 1 presents a plot of the peak pitch points for a continuous subsection of 90 utterances for two speakers.

- (1)
21 B: Oh wasn't ours around four fifty or so?
22 then you have to add tax,
23 then altogether it was close to five hundred.
24 B: Umhum.

In example (1), speaker B's discourse goal is to explain the price of an object, and this goal is resolved by the successful computation of a logical sequence of calculations. This sequence of utterances in U21 to U24 is triggered by the high-pitched doubt and self-reflection expressed by the speaker in U21. In each successive phrase, the speaker explicitly works out the calculations, and the growing certainty brings her progressively closer to a confident conclusion at a low pitch point at U23, and a closing discourse particle *umhum* (U24) to self-confirm at the lowest pitch point. The high pitch level of U21 followed by a large downstep of about 80Hz reflects the emotion associated with the high level of uncertainty at U21 and the subsequent shift towards a resolution in U22.

Regular stepping in more uniform development

The elaboration of topic in discourse often takes on a more settled and structured character. This frequently occurs when a speaker has a more extended series of ideas to present as the discourse enters a more narrative phase. In these situations, the further

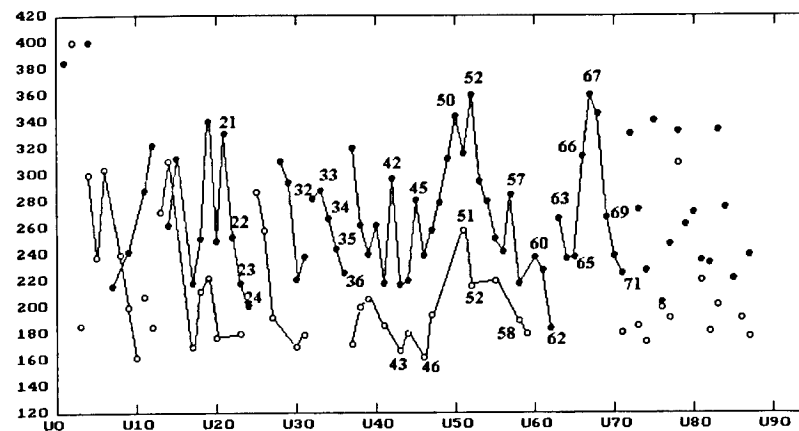


Figure 1. Plot of Pitch Peaks of 90 Utterances
* Speaker A: ○ Speaker B: ●

development and elaboration of topic is often associated with a systematic step structure between phrases which signals the topic organizational hierarchy and indicates that one phrase logically follows the other. In the case of downstepping, proportional or regular steps often occur as the speaker moves systematically towards the completion and resolution of a specific discourse goal. The size of the step is correlated with the degree of emotional intensity or degree of cognitive transformation.

- (2)
32 B: Then - I once before
33 used the facilities of another school -
34 (f) At that time I didn't know how they did it,
35 (f) anyway everything there was computerized,
36 (f) they did it for us.

In example (2), speaker B first introduces the topic, and then adds on successive qualifying expressions in U34 to U36; each qualifying expression drops by about 15 to 20hz. The smaller and uniform step sizes reflect the relative stability and constancy of the speaker's state during this short segment.

Upstepping as cognitive uncertainty

In narrative-like speech, new topics or subtopics are often introduced as more

gradual and natural developments of previous topics, and topic initiation phrases often start at a more intermediate or low level and subsequent phrases develop in patterns of climax and resolution. This may occur because the unity of the narrative development may take precedence over the need to signal new information. Successive upstepping from such low topic initiation points often occurs as emotional elements unexpectedly enter the conversation.

- (3)
63 B: Then we just
asked people to come in to record
64 Then after the recording
65 then we just took that tape -
66 Oh, let me think
what happened then?
67 In any case, in any case ---
68 I forget what happened,
anyway it's just
70 that sound, huh,
69 they just took that tape,
71 and put it into the computer.

Language often reveals the cognitive process. In U63 to U65, speaker B starts out confidently and develops the topic further in U64, but is already hesitant, and her hesitation continues in U65. In U66-U67, speaker B is in a state of cognitive uncertainty, and steps out of

the current topic line to attempt to recall information. The uncertainty of topic development is reflected in the upstepping of these phrases. The speaker finally reaches a cognitive turning point which is indicated by the phrase "in any case, in any case" at U67 to signal a return to the main topic after a digression. Having made this decision, the speaker then returns to a more certain and confident cognitive state, and continues to develop the next logical step. This results in downstepping in U68-U71.

Upstepping between phrases often occurs in situations of cognitive uncertainty, as in self-reflection and doubt, in contrast to downstepping, which is typically associated with definiteness, finality and completion. Upstepping often continues until a climax occurs at a high cognitive turning point, which in this example occurs when speaker B is unable to retrieve the missing information, and decides to go on. The cognitive uncertainty is then resolved and expressed in the subsequent phrases.

Topic, planning and cognitive states

The complexity of topic structure increases as discourse gets more involved and more complicated. In extended discourse, topics and subtopics flow into one another, therefore it is often difficult to pinpoint where the boundaries of a topic are. Most importantly, the progression of natural discourse differs from strict semantic-logical discourse progression. Instead of following exact semantic implications or inferences, as often seen in formal logical models, the reasoning used in natural discourse works according to the principle of *relevance*. In spontaneous conversation, ideas are often triggered in a chain reaction fashion, and topics develop by building on preceding phrases. In addition, speakers often backtrack or step out from the ongoing topic to monitor the communicative process and to provide appropriate background information. Topics are organized as psychologically logical and relevant to the speaker and hearer, and

are initiated and motivated by this principle.

The complex hierarchical and systematic nature of topic intonation can be seen in the section from U43 to U62 (Due to space limitations, the discourse text is omitted). In this section, the speaker is presenting two accounts of a story. The hierarchical intonational structure appears as a sequence of generally upstepping phrases in the first account in U43 to U51, followed by a downstepping pattern in the retelling of the story in U53 to U62.

In the beginning part of this segment, the speaker is building up the topic, and at the same time is trying to recall the specific details and to accommodate and make the conversation relevant to the information status of the other participant. This results in frequent impromptu insertions, add-ons of new ideas, first attempts at making a point, and side developments. In this section, each phrase stems from some feeling of inadequacy about the incompleteness of the previous phrase, or some feeling of uncertainty arising from not having a definite idea of the topic direction. In the meantime, the speaker is working up to a climax point. Each phrase functions to add new information as a way to overcome the previous phrase, therefore each step is higher than the other, until the speaker finally comes to the climax - a high point - in the story. The upstepping pattern is just such an expression and representation of these elements in the speaker's mind. In the subsequent section, the speaker has already organized the essential points in her mind, has also established the appropriate common background, so is free of disruptions, and can concentrate more on the topic structure, i.e. the elements of the story, itself. Therefore her account here is smoother and more certain, as signalled by the gradually descending anti-climactic downslope. The essential point is that the *planning* in these two versions differs: the upstepping section, the 1st version, is less planned, whereas the downstepping section, the 2nd version, is more

planned. This example is evidence that discourse is *not* always pre-planned, and the intonational structure and topic development reflect the degree of planning involved.

This evidence for the use of pitch level to signal topic structure is enhanced by B's three upward spurts within that gradual rise-fall slopes. These three spurts do not follow the general trend but have a temporary rise in pitch level above that trend. In each case, in U45, 52 and 57, the upward spurt occurs because the phrase is a summarization of the previous statements, and is a signal that the speaker has temporarily interrupted the logical stream.

Topic, convergence and divergence

My data also show that discourse is interactionally and cooperatively organized. In discourse, participants accommodate and interact frequently to mutually work out development and resolution of the conversation. The cooperative nature of discourse is manifested in a process of intonational convergence and divergence among participants. Intonational convergence occurs when participants match corresponding movements in pitch ranges of utterance to indicate support of topic hierarchy and development, and to signal enthusiasm and sympathetic agreement with the other speaker's point of view.

The intonational interactions between participants in the segment U41 to U62 show how patterns of convergence and divergence can vary according to the signals of topic organization which the main speaker provides. In the regularly structured narrative, speaker B starts at a low point and then accelerates until the climax is reached in U50. The hearer's pattern is remarkably similar to the main speaker's. When speaker B starts low at U41, speaker A also responds low at U43. As speaker B rises to reach the climax at U50, speaker A also responds with heightened pitch and rises to her highest point at U51. On the anti-climatic downslope, speaker B gradually returns to a state of equilibrium in a series of downsteps, and speaker A's

feedback also follows a downstepping pattern and ends low at U59.

On the whole, speaker A's pitch movements are mirroring exactly the pitch movements of speaker B's, and the two speakers are moving together in an emotionally synchronized manner. At phrases in which speaker B continues the further elaboration of topic, the two speakers' step movements are parallel, i.e. they converge, and this convergence signals that both speakers are in agreement on the topic development.

This overall pattern of convergence is interspersed with isolated instances of divergence where both speakers move in opposite directions. In U42, U45, U52, and U57, when speaker B steps out of the current topic flow to summarize or make a point, as signalled by the abrupt pitch rise, speaker A actually drops her pitch, at U43, U46, U52 and U58, to indicate her acknowledgement and understanding that the phrase is outside the regular topic flow.

The above examples illustrate that discourse is both hierarchically and interactionally organized and that intonation signals systematically the organization of topic and discourse activity. Results of this study demonstrate that progress in the understanding of prosody is gained if adequate consideration is given to the varied functions of intonation in discourse. Topic, discourse context, and discourse interactions are fundamental to the extended meaning which intonation uniquely provides. A clear understanding of the determinants of hierarchical structuring and discourse intonational development is of crucial importance in the further study of natural discourse.

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