

Pausing Strategies as Means of Information Processing in Spontaneous Narratives

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Abstract

This paper investigates the role of pause in the process of information organization in narrative discourse. Following the cognitive research on pausing strategies, the present study assumes that the frequency of pause usage varies as a function of the content of the individual sections in a narrative. The material used for the analysis consisted of a number of spontaneous narratives. The results failed to demonstrate any association between type of information and pausing phenomena, but it revealed the existence of a pattern of varying hesitancy that generally correspond to the different sections in a narrative. This would suggest that pausing in narrative is primarily governed by the cognitive rhythm of speech ([11], [9], [5]).

1. Introduction

Cognitive psychologists tell us that pausing reflects the strength or weakness of certain verbal habits. According to [10], pauses are “synchronous with and indicative of encoding processes responsible for generation of information.” In other words, pauses reflect the cognitive act of planning.

The complexity of information processing plays a central role in the use and duration of pause. In a series of studies, Goldman-Eisler ([7], [8], [9] and [10]) compares the ratios of silent pauses in speech associated with tasks of varying levels of difficulty: the description of cartoons versus their interpretation. She found that the cartoon interpretations were correlated with longer pauses than the descriptions, which would support her initial hypothesis that, for a given task, the longer the delay between stimulus and response, the more cognitive operations are inferred as being required to produce the response. This finding has been replicated in many other studies ([19], [17], [14], [15]; but see [18], for a counterexample).

If it is true that pausing strategies vary according to the function of given information, it is expected that in a narrative text, different pausing strategies will be associated with different sections of the story, characterizing them according to their function.

In order to investigate the validity of such hypothesis, a total of 17 spontaneous/non-elicited narrative texts told in the course of “spontaneous interviews” with a variety of speakers were analyzed.¹ A specific model of narrative analysis, the

Labovian Evaluative Model ([13]), was chosen for the purpose of the present analysis.²

This study is restricted to the analysis of silent pauses, defined by [12] as “a period of vocal inactivity of a certain duration embedded in the stream of speech.” Following the tradition initiated by Goldman-Eisler ([7], [8], [9] and [10]), the present study adopts a cut-off point of 250 ms.³

2. Pausing in narrative sections

According to [13], the structure of a well-formed narrative presents six sections: (1) an “abstract”, which summarizes the story, (2) an “orientation”, which identifies time, place, characters, (3) a “complicating action”, which recounts events, in chronological sequence, (4) “evaluation”, which provides a point to the story, (5) a “resolution”, which concludes the events in the story, and (6) a “coda”, which terminates the story. These sections are listed in their usual order of occurrence (except for the “evaluation”, which may be found in various forms throughout the narrative), but [13] indicates that most narratives do not in fact contain all of these elements. According to him, only the section “complicating action” is necessary for a minimal narrative, since a minimal definition of narrative involves simply a pair of temporally ordered events.

In a narrative, the sections that would be closely related to the cognitive process of interpreting are the “evaluation” and the “coda,” while the other sections (“abstract,” “orientation,” “complicating action” and resolution”) involve the less complex process of “describing.” As noted above, “evaluations” are ways in which a narrator provides the point for telling a given story. The main function of a “coda” is to signal the end of a narrative, by returning the conversation to the point where the narrative was brought about. However, a “coda” does not only function as a bridge to different speech modes, but, most of the time, it also sums up the point of the narrative, which often contains some sort of interpretation of the narrative as a whole. Since both sections are characterized by the more complex process of interpreting, one would

¹ These narratives derive from a larger investigation on the role of prosodic features in the organization of spontaneous narratives ([16]).

² For a justification of the employment of the Labovian Evaluative Model in such analysis and a detailed description of the methodological procedures, refer to [16].

³ According to [10], the consequences of adopting a minimum cut-off point well above 250 ms are numerous, since 71.5% of all pauses occur in the duration interval between 250 ms and 1 sec (see also Dalton & Hardcastle 1977 for a similar claim). She also points out that the consequences of adopting no minimum cut-off point are serious as well, since short periods of silence — which cannot be considered as psychologically functional pauses — are required for articulation.

expect the presence of a larger number of pauses of longer duration in such sections.¹

In order to control for subject productivity, the concept of potential pause position ([4]) was used for the analysis of pause occurrence in relation to narrative sections. Since a speaker can potentially pause between each pair of words in an utterance, a word boundary may be regarded as a potential pause position. In Figure 1 below, the number of pauses in each narrative section is expressed as a ratio of number of potential pause position in each section.

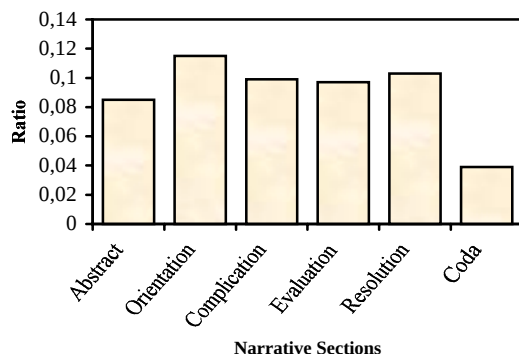


Figure 1 : Distribution of pauses as a ratio of potential pause positions in each of the six narrative sections

The numbers in Figure 1 contradict the above stated expectations. Neither evaluations nor codas are characterized by the presence of a larger number of pauses. As a matter of fact, codas display a considerably low quantity of pause, in relation to the other narrative section. While results of an analysis of variance showed statistically significant correlation between the occurrence of pause and narrative sections ($F(5,91)=2.419$, $p<0.0421$), post-hoc tests (Tukey-Kramer multiple comparisons) revealed that only codas differ significantly from all other sections.² It should be noted, though, that pauses occurring after the last intonation units in all the narratives were not counted, as they were not considered to be an integral part of the narratives. Since codas most often occur at the end of narratives, it follows that this might have somehow influenced the above results. Moreover, the analysis of variance showed a barely significant effect. It appears that pause occurrence was equally distributed in all narrative sections. Of course one could easily argue that this result is probably due to the questionably high cut-off point that was adopted here.

As for pause duration, no statistically significant effect was found that could substantiate the hypothesis that narrative sections are individualized by means of pause length.

¹ In a study on pause strategy employed by native and non-native speakers of English in storytelling, [6] observed that both groups of subjects paused far more often in passages of the narratives that would correspond to the Complication and the Resolution section in the Labovian terminology. According to her, this happens because of the importance of the information carried out in these sections: the more necessary the information is to the speech event, the more prone they are to pause.

² An analysis of the distribution of pause to speech ratio yielded a very similar pattern.

However, Table 1 below shows a trend in the direction of pauses being longer at the end of the narratives (in the resolution and the coda sections), despite the high standard deviation in both cases. This could probably be interpreted as a means for the narrator to indicate that the narrative is approaching an end.

Table 1: Mean pause duration and standard deviation for each of the six narrative sections

	Abstract	Orientation	Complication
Mean	0.728	0.732	0.772
Sd.	0.343	0.369	0.405
	Evaluation	Resolution	Coda
Mean	0.739	0.862	0.980
Sd.	0.460	0.615	0.806

In general, the above analyses refute the hypothesis that pause occurrence and duration vary as a function of the individual narrative sections. It seems that on the whole, the content of individual portions in a narrative has little or no influence on pausing strategies.³ A closer look at individual narratives, however, will show that sections vary in terms of pause to speech ratio. If it is not the content of the narrative section that determines this variation, what would be?

3. The cognitive rhythm

[11], [9] and [5] have argued that planning for units of discourse is cyclical. They describe a pattern in which a period of long pauses and short speech bursts alternates with a period of little pausing and continuous speech. They call this pattern the “encoding cycle” and propose that it reflects an underlying “cognitive rhythm,” in which the hesitant period would correspond to planning while the fluent phase would reflect the execution of this planning. As [18] accurately observe, “this portrayal of the role of pauses and the model of the speaker implied is attractive ... it suggests units of speech production which are functional rather than structural in nature, i.e., units based on cognitive activity rather than on linguistic analyses which may or may not be relevant to encoding processes” (see also [1], [2] and [3]).

According to [5], what contributes to this variation are semantic factors, rather than syntactic ones. It is reasonable to expect then that this pattern would emerge in the material under investigation here. Since all narratives are segmented into sections that display a coherent semantic unit, one would anticipate the presence of an “encoding cycle.”

Figures 2 and 3 below display the common pattern found in most narratives in the data. The cycle described by Goldman-Eisler and her associates is present here: a period of low pause to speech ratio is commonly followed by a period of higher pause to speech ratio in each narrative section.

³ Note that while this is true for all the narratives as a whole, individual cases should be considered: it is always possible that correlations based on a group of material may wash out important relations within cases taken individually. Some narratives show a pattern that at least in part confirm the hypothesis in question: pauses occur more often and are longer at evaluation sections and codas than anywhere else.

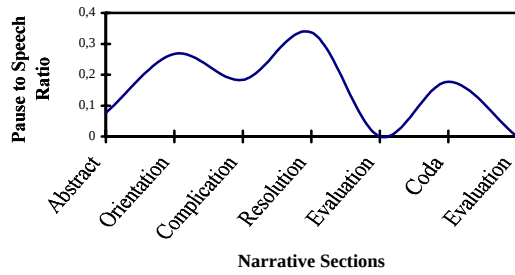


Figure 2: Pause to speech ratio plotted over time for narrative 05

[11] propose that the “encoding cycle” is characteristic of spontaneous speech, as opposed to reading, which would probably not require the same amount of cognitive organization as non-prepared, spontaneous speech. Furthermore, [9] suggest that “cognitive rhythm” is more likely to occur in speech samples containing at least 30% of pausing and involving a cognitively demanding content. Although most of the narratives in the present study contain less than 30% of pausing and bring no complex or novel content, the presence of the “encoding cycle” could be easily verified, even in narratives of very short duration, as Figure 4 below illustrates.

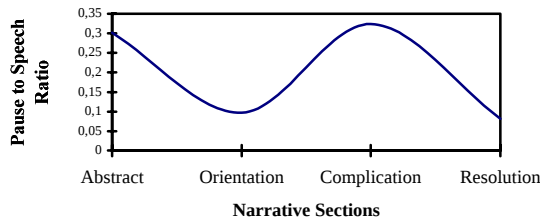


Figure 4: Pause to speech ratio plotted over time for narrative 15

Despite the fact that the “encoding cycle” can be characterized by the alternation of pause frequency in every other narrative section, this is not often the case. Some narratives do not display a difference in pause to speech ratio between narrative sections in some few instances. For example, in narrative 06 (Figure 5) the difference between pause to speech ratio in the orientation section and the first evaluation section is a positive one, i.e., the ratio in the first evaluation section is not lower than the ratio in the previous section, as would be expected. The same occurs in the boundary between the second evaluation section and the second complication section in the same narrative.

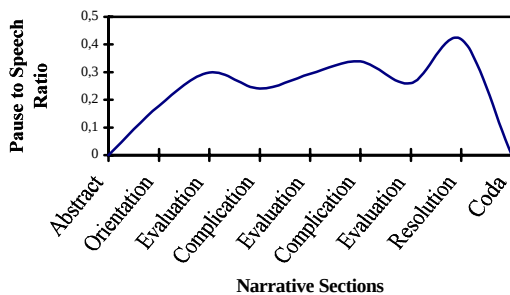


Figure 5: Pause to speech ratio plotted over time for narrative 06.

It could be argued that this might be due to the degree of embedding of the narrative sections into each other. The more a narrative section is embedded to another in terms of its content, the less likely it will differ in terms of pause to speech ratio. Not surprisingly then, this phenomenon frequently involves evaluative sections: those sections have a higher degree of embedment with several other sections in a narrative, making it sometimes very hard to identify them as a separate unit. The distinction between the orientation section and the first evaluative section in narrative 6 is very loose:

Table 2: Excerpt of Narrative 06

Narrative 06	Narrative 06
Complication	Complication
02 <i>eu me lembro quando eu era criança</i>	02 <i>I remember when I was a child</i>
03 <i>na escola</i>	03 <i>in school</i>
Evaluation	Evaluation
04 <i>menino como eu me lembro dessa cena</i>	04 <i>boy how I remember this scene</i>
05 <i>poxa eu fiquei tão (0.43) triste</i>	05 <i>I got so (0.43) sad</i>
06 <i>tão triste no mundo (...)</i>	06 <i>so extremely sad (...)</i>

From a textual viewpoint, the orientation and the evaluation sections have a very close relationship: the evaluation elaborates on the information given in the orientation section. It even brings the same lexical item that is found in the orientation section (the verb “remember”). However, the information contained in the section that follows the orientation section in narrative 06 is primarily evaluative (the IU “boy how I remember this scene,” for example, can be interpreted as both a repetition of the first IU in the orientation section, as well as an intensifier of the same IU).¹

Since the first evaluation section in this narrative is so intrinsically related to the orientation section in terms of its content, the pattern described by [12], [9] and [5] fails to occur: there is no semantic dissimilarity between those sections that would justify the occurrence of the “encoding cycle” ([5]).

4. Discussion

No significant effect of pause occurrence and duration in relation to the various sections in a narrative was found. It was expected that sections containing any sort of interpretation, such as “evaluations” and “codas” would present a higher number of longer pauses than sections containing only descriptive information, such as “orientations” and “complicating actions.” Since information dealing with the more cognitively complex task of interpreting requires a longer span of time to be processed, the occurrence of longer pauses – which would be interpreted as the delay between stimulus and response in speech – would consequently be expected. However, the analysis did not show any relationship between narrative section and pausing strategies.

In several studies on the function and use of pause in discourse, Goldman-Eisler and her associates ([5], [7], [8], [9], [10], [11]) demonstrated that pause to speech ratio varies as a function of task complexity: people tend to pause more often

¹ Repetitions and intensifiers are considered evaluative features by [13].

and to remain in silence for much longer when performing the more complex task of interpreting the actions of a cartoon, rather than simply describing the same actions. It should be stressed that unlike Goldman-Eisler's studies, this work deals with non-elicited material. The fact that the subjects in Goldman-Eisler's studies were not familiar with the content of the material under investigation may have a decisive influence on the results there. The narratives in the present study are possibly part of each individual's repertoire of stories. Therefore we may expect less hesitation in the material used in this study.

Nevertheless, it was verified that a pattern displaying a period of hesitation followed by a period of fluency — which would correspond to the cognitive processes of planning and execution respectively — do exist in all narratives in the data and that this pattern reflects the way the narratives are structured: the periods of varying hesitancy generally correspond to the different sections in a narrative. It seems then that pausing phenomena (pause occurrence and duration) rather than being determined by the content of the information being carried by the individual narrative sections, is primarily governed by the cognitive rhythm of speech as proposed by [11], [9], [5]. The "encoding cycle" was also verified by taking into consideration pause length within narrative sections and at narrative boundaries: in storytelling, speech seems to be relatively hesitant at narrative boundaries (shown by longer duration of pause at these sites) and relatively fluent within narrative sections (as a consequence of the shorter duration of pauses within those units). The "Period of Planning" in this general semantic Plan (storytelling) would correspond to the narrative boundaries, while the period in which the Plan is executed would correspond to the narrative sections properly. This would once more lend support to the concept of the cognitive rhythm.

5. Conclusion

The analysis of pause as a function of the content of individual narrative sections failed to show any significant effect. Nevertheless, the consideration of narrative sections as part of a cognitive cycle that would determine the frequency of pause usage resulted in a very favorable explanation for the observed variation of pause to speech ratio amongst narrative sections. It seems thus that pausing strategies in spontaneous narratives serve as a structural tool, organizing the various sections of a story into identifiable units. This finding suggests that speakers make regular use of this prosodic cue to evince the segmentation of narrative texts into "chunks of information" that closely correspond to the notion of "narrative section" proposed by [13]. It remains to be tested whether such cue is *perceptually* significant. Research on this matter is already being conducted.

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