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Some temporal aspects of stories told while or after watching a film

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Adult native speakers of German told the pear story in German while or after watching the pear film (Chafe, 1980). With respect to temporal measures, storytelling after watching the film was comparable to storytelling described in the archival literature. The overload occasioned by simultaneous perceptual (visual) and productive (speech) processing shifted some temporal measures dramatically for subjects telling stories while watching the film: percentage of pause time/total time almost doubled, and pause duration quadrupled. Frequency of pauses remained unchanged, but articulation rate slowed moderately. These findings pinpoint the phrase (defined here as syllables/pause) as a stable response measure in speech production. Use of various units for the interpretation of speech production is criticized.

Analyses of temporal measures during storytelling have constituted a substantial part of the archival literature on temporal organization of monologic discourse. Kowal, Wiese, and O'Connell (1983) reviewed this literature for stories told by subjects after exposure to pictorial materials (pictures, cartoons, or films).

In introducing his pear film narratives, Chafe (1980) argued for the use of "the way people talk about what happened in a film as data relevant to the study of consciousness, and particularly, of the manner in which consciousness is deployed through time" (p. 10). The statement seems to imply that the way people use time in such narratives is important. Nonetheless, Chafe's use of temporal data turns out to be selective, subjective, and completely bereft of both descriptive and inferential statistics.

The present research is intended to apply a more rigorous methodology to narratives based on Chafe's (1980) pear film, to compare objective temporal data from pear film narratives to those of the archival literature and of literature published since Kowal et al.'s (1983) article, and to compare stories told by subjects *while* watching the film with the more commonly investigated stories told by subjects *after* watching the film.

A peculiarity of the present research should be noted here. Data for the stories told after watching the film have already been cited in Kowal et al. (1983) from an unpublished manuscript (Kowal & Wiese, 1981). These data constitute only a small percentage of the archival literature cited by Kowal et al.; however, this overlap must be kept in mind by readers when we compare the data of the present research with the archival data.

To our knowledge, the only recent research about stories based on pictorial material (in this case a Thematic Apperception Test picture) and the temporal analyses thereof was by Van De Water, Monti, Kirchner, and O'Connell (1987).

Telling a story while viewing pictures or cartoons should not be expected to differ greatly from telling a story after viewing those stimulus materials. Wiese (1983), however, found a significant difference in articulation rate for stories told in the presence or absence of a cartoon (4.40 vs. 3.90 syllables/sec, respectively; p. 102) and a significant interaction (English-German × presence-absence) with regard to phrase length: in English, phrases were longer with the cartoon present (7.24 vs. 5.89 syllables/pause); in German, phrases were longer with the cartoon absent (6.42 vs. 5.82 syllables/pause; p. 105).

A film, however, is quite another matter. It is not static, and its content is not largely exhausted after brief inspection. It proceeds and develops dynamically over time. Therefore, instructing the subject to tell the story while watching a narrative film should be expected to put the subject into a situation of temporal overload. The simultaneity of visual perception and speech production demands should be expected to alter the temporal organization of the spoken story.

METHOD

The pear film (Chafe, 1980, p. xiii f.) portrays the theft of some pears by a boy and his subsequent experiences with the pears. The film is

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in color and has a soundtrack of the accompanying sounds (e.g., pears being plucked, a moving bicycle), but no speaking. The film is 361.52 sec in duration.

Subjects in the experiment were 20 men and 19 women, all volunteers and all students at the Technical University of Berlin. The average age was 24 years. Subjects were run individually. Instructions were to tell the story of the film during the showing of the film or after the showing. Accordingly, these two conditions were named *during* and *after*. In the latter condition, a second experimenter entered the room after the showing, turned on the tape recorder, and sat and listened without saying anything during the subject's storytelling.

We assumed that the duration of the film would by and large dictate the duration of the story in keeping with the instructions for the *during* condition. We hypothesized that overload in the *during* condition would inflate pause or offtime and alter articulation rate. The articulation rate might conceivably be expected to accelerate, to afford subjects more pause time, or to decelerate, again because of the perceptual overload. We opted for the latter as a more plausible tactic on the part of subjects in their efforts to optimize time utilization in storytelling during the film. No differential hypotheses were entertained for men and women. After preliminary analyses further indicated no differences in this regard, data of men and women were combined for experimental analyses.

The principal temporal measures derived from the tape recordings were percentage of pause time/total time, articulation rate (in syllables/sec of ontime), speech rate (in syllables/sec of total time), mean duration of pauses, and phrase length (in syllables/pause). This last measure reflects frequency of pauses. A cutoff point of 0.23 sec was specified as the minimum duration of pauses measured. Tape recordings were processed through a Siemens Oscillomink L and an F-J Fundamental Frequency Meter (Type FFM 6502) to derive these measures from acoustic energy over time level recordings.

RESULTS

Means and standard deviations of the principal temporal response measures are presented in Table 1, along with the means of the corresponding measures from the archival literature (Kowal et al., 1983, p. 386) and from more recent research (Van De Water et al., 1987, p. 100). Comparisons of the two experimental means (during and after) by means of inferential statistics appear to be redundant for speech rate, pause duration, and percentage of pause time/total time; in all these cases, there is little overlap in the distributions of the two conditions. The two articulation rates proved to be significantly different [$t(37) = 3.70, p < .01$]. The phrase lengths, however, were not significantly different.

Table 1
Means (*M*) of Temporal Response Measures from the Extant Literature (Archival and Recent) and Means (*M*) and Standard Deviations (*SD*) from During and After Conditions of this Experiment

	Literature		Experiment			
	Archival	Recent	During		After	
Response Measure	*M*	*M*	*M*	*SD*	*M*	*SD*
Speech Rate (syllables/sec)	3.43	2.92	1.78	0.57	3.62	0.46
Articulation Rate (syllables/sec)	5.17	4.51	4.73	0.59	5.40	0.53
Pause Duration (sec)	0.94	0.97	3.82	2.45	0.87	0.16
Phrase Length (syllables/pause)	9.0	4.9	9.1	1.5	9.8	2.4
Percentage of pause time/total time	33.3	34.1	61.9	12.0	32.7	8.0

The duration of the film did indeed control the total time utilized by subjects in the during condition. Their mean total time was 339.74 sec, whereas the mean total time in the after condition was 181.75 sec. The corresponding standard deviations were also quite different (*SD*s = 25.63 and 63.62), with far more variation in the after condition. In terms of pause or offtime alone, the during condition had more than three and a half times the mean offtime as did the after condition (*M*s = 210.30 and 59.43 sec; *SD*s = 36.15 and 23.33). On the other hand, the corresponding ontimes (*M*s = 129.44 and 122.32 sec) and mean numbers of syllables (*M*s = 655 and 595 syllables; *SD*s = 239 and 206) were not significantly different.

Comparison of the means for the after condition with those from the archival literature (see Table 1) indicates a rather close correspondence. The more recent literature is not as close a match, but the only striking difference between the after condition means and those from the recent literature is in phrase length (*M*s = 9.8 and 4.9 syllables/pause). The major contributor to this difference is the difference in cutoff points for measurement of minimum pause duration in the two cases (0.23 and 0.10 sec). The Van De Water et al. (1987) cutoff point (0.10 sec) causes a segmentation into smaller phrase lengths by including as data more of the shortest pauses.

Another way of comparing the during and after conditions in the present experiment is to look at the distribution of pauses in several durational brackets: 0.23–1.00 sec, 1.01–2.50 sec, and > 2.51 sec. The corresponding percentages for the during and after conditions, respectively, are: 38.9%, 26.3%, 34.9%; and 69.2%, 29.2%, 1.6%. In other words, a good third of the pauses in the during condition are displaced from the shortest to the longest bracket.

DISCUSSION

One might argue that the during condition is highly contrived and unrealistic. Quite the contrary is the case. There are several analogous situations that demonstrate similar simultaneous perceptual-production overloads. One is the stereotypic live radio reportage of a sporting event. A parade or a ceremony does not fit the analogy because the pace of these events is much slower than that of a sporting event. Simultaneous translation is also analogous, precisely in terms of the perceptual-production overload in this setting. However, temporal aspects of live sport reportage (e.g., Hegedüs, 1957) and simultaneous translation (e.g., Goldman-Eisler, 1972, 1980) have not been researched extensively enough to provide data comparable to those of the present experiment.

In the present study, the ontime factors, except for a small but significant reduction in articulation rate, remained quite constant across both experimental conditions. The significant shift in articulation rate across conditions is important in view of Goldman-Eisler's (1968) contention that articulation rate "is a personality constant of remarkable invariance" (p. 25). The present finding indicates quite the contrary: articulation rate varied quite sensitively to the experimental conditions. The fact that Wiese's (1983) differences in articulation rate were in the other direction is not inconsistent with the present finding, since Wiese's stimulus materials were cartoons. The presence of the cartoon was a

static situation; there was no novel input of content from moment to moment. Presence of the cartoon (relative to its absence) led to acceleration of articulation rate rather than deceleration, as in the case of the during condition of the present research.

The corresponding offtime factor that remained constant was the numerosity of pauses, reflected in the constancy of phrase length across the two conditions. One might wonder that in Wiese's (1983) research, the mean phrase length was only 6.35 syllables/pause. Again, his data are quite consistent with the present findings; one must keep in mind that half of his data were based on non-native speech. His data from native speech were actually quite close to the data of the present research in phrase length (8.3 syllables/pause; p. 104).

At this point of our comparisons, however, the similarities cease. The difference in percentage of pause time/total time in the two conditions of the present research is almost entirely a consequence of the huge inflation of mean pause duration in the during condition. This seems to indicate that people spend longer periods of time pausing, although they do not pause more frequently, in the overload situation. They also seem to use ontime for continuing their monitoring of the visual input by slowing down their articulation rate.

Our investigation of temporal aspects of storytelling has clearly yielded an orderly description of constancies and differences across the conditions of the experiment. Phrase length is obviously the response measure that remains constant amidst the other dramatic changes. We make no claim, however, to have isolated an empirical correlate for some ultimate unit. Speakers simply segment their speech conveniently in keeping with the complex demands of the setting. Kowal et al. (1983, p. 386) found, for example, that phrase length varied from a mean of 9.0 syllables/pause to 13.5 syllables/pause from the genre of storytelling to that of the interview.

The very multiplicity of candidates might indicate that there is considerable disarray in the search for a basic unit: tone-group, pause-group, phonological phrase, and phonemic clause (see Ellis, 1979, p. 168); spurt, information unit, information block, tone unit, and idea unit (see Chafe, 1980, p. 13); syntagma (see O'Connell & Slaymaker, 1984, p. 280 f.).

Let us return, then, to Chafe (1980) and his statement that "spontaneous speech has the property of being produced in spurts, which [he] called *idea units*" (p. 48). Note that Chafe previously assumed, along with William James, that consciousness is "jerky" (p. 12). All Chafe required from his data base, therefore, was that the spurts show quite proximately *when* the jerkiness in consciousness occurred. Chafe's assumption, in other words, was one of a one-to-one relationship between spurts in speech and jerks in consciousness. The relationship must be a temporal one and a proximate one, or it becomes meaningless.

We do not wish to argue that consciousness is unimportant, but only that the anecdotal, subjective, selective use of temporal data is simply not adequate to establish the relationship that Chafe (1980) would like to find. Indeed, Chafe himself acknowledged that the criteria for identifying spurts ("intentional, hesitational, and syntactic," p. 14) *do not* consistently mark spurts and *do* mark nonspurts (i.e., positions in which these markers serve some other function). Small wonder, then, that he reverted to what he called "careful and consensual introspection" (p. 10). We must conclude, therefore, that there is no evidence in Chafe's analyses that his spurts or idea units are truly "linguistic expressions of focuses of consciousness" (p. 48). Again, Chafe himself gave us a clue as to the weakness of his methodology: "What is going on in the mind may in fact usually be manifested in a conjunction of certain overt signals, but it is unlikely to be always so represented" (p. 14). We would like to paraphrase this citation as follows: "What is going on in the mind may in fact be manifested in someone else's intuitions, but it is unlikely to be consistently so represented." The "careful and consensual introspection" does not suffice.

More bluntly stated, Chafe guessed what is in someone else's consciousness. He found both what he expected from the beginning to find and, in fact, what he could have guessed completely independently of his pseudo-scientific analyses. The most commonplace introspection tells us, however, that, Chafe and James to the contrary notwithstanding, our consciousness does not jerk, but wanders off. That is to say that, even amidst the spurts of speech, we are remarkably capable of being elsewhere in our thoughts.

The search for the magical unit is no easier than the search for the mythical unicorn. Neither exists. It is far better to find objective commonalities and differences than to find specious spurts based on no reliable criteria whatsoever, but only on the subjective intuition of the researcher. In any event, the intuition that consciousness somehow jumps when speech spurts remains unfounded. In fact, we are not at all sure that it is even meaningful to speak of the deployment of consciousness in such terms as units, spurts, and focuses. Consciousness in such terms is certainly not meaningful or appropriate as part of the empirical logic of research on temporal, syntactic, or prosodic response measures.

Perhaps Rochester (1973) offered the best advice for the investigation of temporal aspects of spontaneous speech:

> It may be that the search for *units* of encoding has itself been the most serious stumbling block to a view of multileveled decision-making by the speaker.... Perhaps it is wise to leave the search for units to engage in a pursuit of processes or operations which can and often do cooccur. (p. 78).

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