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The Meaning of Before versus After

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Authors
Wakefield, Lonnie A.
Lu, Shulan

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The Meaning of Before versus After

Lonnie A. Wakefield (lwakefiel@leo.tamu-commerce.edu)
Shulan Lu (Shulan_Lu@tamu-commerce.edu)
Department of Psychology, Texas A&M University - Commerce
Commerce, TX, 75429-3011

How do people describe event temporal relations? In psychology, Graesser and his colleagues (2001) have proposed a common representational system for representing text, episodic experiences, and world knowledge. Their representational theory proposes that BEFORE, AFTER, and DURING are primitive relations for encoding the temporal relations. Similarly, Wierzbicka (1994) proposed these three semantic primitives. Lu (2004) asked participants to sort words encoding temporal relations based on their similarity in meaning. Participants sorted words encoding BEFORE versus AFTER into separate groups. Such clustering is consistent across grammatical categories, whether they are verbs, adverbs, or prepositions.

Events have beginnings, ends, and also overlap in time with each other. The present study used events that were comprised of Allen's (1991) event temporal representations, as shown in Figure 1, to investigate three hypotheses. The sequential hypothesis states that "before" ("after") encodes events that have sequential ordering. The beginning state hypothesis states that "before" ("after") encodes the beginning of one event preceding (following) the beginning of another event. The end state hypothesis states that "before" ("after") encodes the end of one event preceding (following) the end of another event.

Experiment 1

Method: Twelve introductory psychology students viewed one stimulus film at a time and made acceptability ratings. BEFORE, OVERLAP, START, DURING, and FINISH relations were used as critical trials, whereas MEET and EQUAL were used as filler trials. For example, participants rated whether the sentence "He drank the coffee before he read the newspaper" was linguistically acceptable. The rating scale ranged from 1 to 6, with 1 and 6 labeled as "not at all acceptable" and "perfectly acceptable", respectively.

There were 18 trials per block, and 3 blocks of trials in total. The stimulus events were not causally contingent upon one another.
Results: For simultaneous events, there were significant differences in acceptability ratings between sentences that focused on the beginning states (M = 4.95, SD = .79) versus sentences that focused on the end states (M = 2.33, SD = 1.20), $F (1, 11) = 32.69$, $MSE = 1.26$, p < .001. The results suggested that "before" encodes the differences between the beginning states instead of the end states of events.

Experiment 2

Method: Thirteen different students participated in Experiment 2. The materials and procedure were the same as in Experiment 1, except the critical rating sentences replaced the word "before" with "after".
Results: With the exception of OVERLAP, sentences that described simultaneous events were rated as marginally acceptable, M = 3.80, SD = .91. The results did not provide strong support for beginning state hypothesis or the end state hypothesis.

Conclusion

"Before" and "after" are not mirror images of each other. "Before" encodes the differences between beginning states of events, as seen in the ratings for simultaneous and sequential events. "After" tends to encodes events that are sequentially ordered.
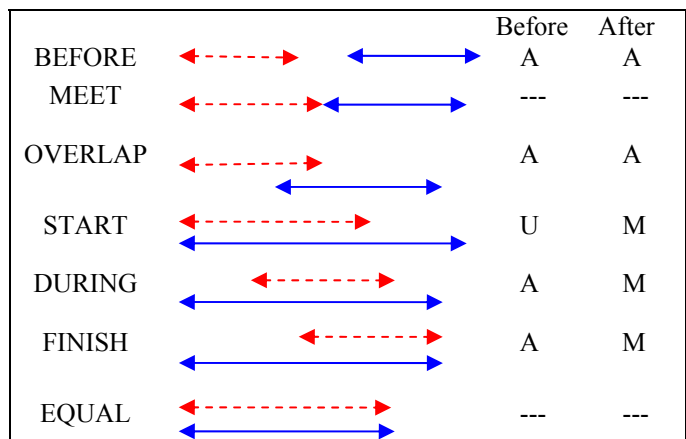

Figure 1: Temporal Relations (adapted from Allen, 1991, pp.5)
A = acceptable, U = Unacceptable, M = Marginally acceptable

	Before	After
BEFORE	A	A
MEET	---	---
OVERLAP	A	A
START	U	M
DURING	A	M
FINISH	A	M
EQUAL	---	---

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