

## Time dynamics of referential processes in discourse

T. Givon, Wendy Kellogg, Michael I. Posner, Penny Yee  
Depts. of Linguistics and Psychology and Cognitive Science Program  
University of Oregon, Eugene

Thoughts exhibit continuity over time. It is the ability to integrate separate elements into a coherent theme that is an essential aspect of cognition. Yet it has proven difficult to find experimental methods to investigate the processes providing the basis of such continuity. One of the attractive parts of the study of discourse is that discourse is defined in terms of the existence of a coherent theme that allows us to relate varied elements. In order to continue a theme over time it is important to refer to concepts that have been mentioned previously but are not now present. Language provides a number of specific devices for referring the listener or reader back in time to the concepts that are relevant to the current information. Pronouns, repetitions of a noun phrase used previously, or closely related noun phrases that serve to reinstate the previous concept are all devices that can be used to reestablish in the reader's mind a previous topic.

Givon has proposed that languages use differing syntactic devices to signal the reader or listener how far back the information which is being referenced occurs. If a topic has been absent for some time, a noun phrase will be used to refer to it. Since readers or listeners never know how long the discourse will be, it appears likely that they retrieve the topic on-line while they continue to listen to or read new information. It would be useful to be able to observe the time dynamics of the processes which are used to reinstate such topics.

The present studies employed chronometric methods to examine the time dynamics of the processes used to reinstate concepts central to the discourse topic. Subjects pressed a bar to receive each successive word of discourse while monitoring the CRT screen for a visual probe, to which a speeded detection response was required. Dependent measures were the time to respond to the probe and the bar-press time on a referring device and its surrounding words. These measures were examined in two experiments as a function of the degree of continuity of the discourse and the type of referring device (noun phrase or pronoun).

Results showed differences in maximal interference for noun phrases vs. pronouns. Pronouns show an earlier interference effect than noun phrases. A careful examination of the time course data from Experiments I and II also reveals some evidence in favor of prolonged processing in cases where the syntactic device is not appropriate. When a pronoun is used to reinstate a topic which has been absent for several clauses, interference is prolonged relative to the case where a pronoun refers to a continuously present topic. In contrast, interference for noun phrases does not differ as a function of the referential distance. The results show that on-line psychological methods are sensitive to differences in reference between noun phrases and pronouns, and may provide data useful for evaluating linguistic theories of reference.