



## The importance of causality processing in the comprehension of spontaneous spoken discourse

Jazmín Cevasco<sup>a</sup> y Paul van den Broek<sup>b</sup>

<sup>a</sup>Universidad de Buenos Aires y Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina

<sup>b</sup>Dept. of Educational Studies, Leiden University, Holanda

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*The comprehension of discourse involves the establishment of causal connections among statements. The Causal Network Theory (Trabasso & Sperry, 1985) allows us to examine the role of these connections in the construction of a coherent text representation. Cevasco and van den Broek (2008) applied its tools to explore the comprehension of spontaneous spoken discourse. Their results indicate that statements that have a large number of causal connections facilitate comprehension to a greater extent than those that have a low number of connections. These findings suggest that listeners rely on processing the causal interconnections between a speaker's statements to derive a coherent representation of discourse in memory, and can provide useful insights for educators.*

In order to construct a coherent representation of discourse, the comprehender needs to establish causal connections among statements (Sparks & Rapp, 2010; Trabasso & Sperry, 1985). These connections indicate that facts and events described in one statement cause or lead to facts and events in another sentence (van den Broek, 2010). The Causal Network Theory (Trabasso & Sperry, 1985) has examined the role of these connections in the comprehension of discourse. In order to determine whether a causal connection exists between two statements, it proposes three criteria: temporal priority (a cause must come before its outcome), operativity (a cause must be in operation or active when the outcome occurs), and necessity (following Hume, 1739/1964; Lewis, 1976



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and Mackie, 1980, a cause must be necessary for the consequence to occur. That is, one must be able to state that if the event described in statement A had not happened, then the event described in statement B would not have happened). Four types of causal connections have been identified: physical causality (statement B describes changes in the physical states of objects or persons as a consequence of what is described in statement A), psychological causality (statement B describes an internal reaction to the event described in statement A), motivation (statements A describes a goal and statement B an attempt to attain it) and enablement (statement A describes a precondition that is necessary, but not sufficient for the occurrence of statement B other). For example, when we read the following pair of statements (van den Broek, 2010): "The explosion caused by the giant meteor was enormous. It contributed to the extinction of many species", we can propose that the first statement physically caused the second one.

Studies on the role of causal connectivity in comprehension have tended to focus on written discourse. Their results suggest that statements that have a large number of causal connections tend to be recalled more often (Espin, Cevasco, van den Broek, Baker & Gersten, 2007), judged as more important (Trabasso & Sperry, 1985) and retrieved more quickly (O'Brien & Myers, 1987) than those that have a small number of connections. Although these studies provide important information, they have not looked at the possible role of such connections in the comprehension of spontaneous spoken discourse (e.g., a conversation, or the discourse that teachers produce while presenting topics). This gap is important, because oral practices are crucial for our participation as members of a community (Cevasco & van den Broek, 2016; Sparks & Rapp, 2010), and because there are considerable differences between spoken and written discourse, which could lead to differences in the impact that causal connectivity has on their comprehension. For example, spoken discourse comprehension requires listeners to process the discourse at the rate that it is produced and does not allow readers to re-process the statements, whereas reading requires decoding skills but also allows the comprehender to read at his or her own pace and re-read sections (Ferreira & Anes, 1994).

To begin to explore the role of causal connections in the comprehension of spontaneous spoken discourse materials, Cevasco and van den Broek (2008) applied the procedures of the Causal Network Theory to parse an excerpt of a radio transmission in English (on the topic "Racism and everyday language") into causes and consequences expressed in the announcers' statements. Considering previous research on written discourse, they expected statements that had many causal connections to other statements to be recalled more often than statements with fewer connections. To test this, they asked U.S college students to either listen to the excerpt of the transmission or to read its transcript, and to perform free recall and question-answering tasks afterwards. Results showed that the more causally connected statements were better recalled and more often included in answers to questions about the materials than the less causally connected statements. This was the case both when the radio transmission was presented in oral and when it was presented in written format. Thus, listeners also appear to rely on processing the causal interconnections between a speaker's statements to derive a coherent representation of discourse in memory. Those statements with more causal connections make a greater contribution to this representation and to be more easily accessed when comprehenders are required to retrieve or answer questions about what a speaker said.

The consideration of these findings can provide insights for educators. Given that causal connectivity plays an important role in the understanding of spoken discourse, it may be useful for teachers to try to establish such connections while presenting the topics to the class, with the aim of connecting the statements that are conceptually central to the lesson and that the teacher wants the students to be able to remember. Further investigations on the comprehension of both written and spoken discourse are ongoing, and their results will continue to expand our understanding of how students' learning can be facilitated.

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