

Effect of causal and temporal subjunctions on coherence processing

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Background: Coherence refers to the logical connections underlying a text. Explicit connectives can improve processing [5, 6]. A symptom from cognitive communication disorders are problems in linguistic coherence [3] in patients' narrative productions. Less is known about how these patients *comprehend* coherence relations. Ultimately, we want to investigate the effect of coherence markers on processing in two clinical populations who have difficulties with coherence: schizophrenia patients and elderly patients with mild cognitive impairment. We expect that these groups will experience a benefit from the presence of coherence markers. Here we present the data of healthy controls.

Methods:

Participants. Thirty-two university students with a mean age of 26 and twenty-four participants with a mean age of 63 took part in the study. Both groups consisted of native speakers of German.

Materials and design. Eighty German sentence pairs were used based on [2, inspired by [1]]. Half had an underlying causal relationship, the other half a temporal one. Incoherent sentence pairs were created by changing the pairings of first and second sentence. Half of the sentence pairs were presented with a connector (*deshalb* 'therefore', *dann* 'then'). Different experimental lists were created to ensure full counterbalancing. The design is exemplified in Table 1.

Procedure. Participants read a sentence pair one sentence after the other on a computer screen. After the presentation of the second sentence, participants judged the coherence of the two sentences by moving a slider with the endpoints "coherent" and "not coherent". An invisible scale from 0 – 100 underlying the slider bar provided us with coherence ratings. We also collected reading times for the second sentence for the young group. As the same sentences occurred in coherent and incoherent conditions, reading time differences should be caused by the ease of contextual integration.

Results and discussion: Fig. 1 presents the findings. The effects of coherence were significant for both young ($\beta = -38.8$, $t = -48.8$, $p < .001$) and old ($\beta = -43.9$, $t = -58.5$, $p < .001$). The presence of a connector increased coherence ratings in the young group ($\beta = -1.6$, $t = -4.3$, $p < .001$) but not in the old. Only the old group showed a significant effect of relation ($\beta = 0.8$, $t = 2.1$, $p < .05$). For both groups, both coherence (young: $\beta = -1.5$, $t = -4.3$, $p < .001$, old: $\beta = -1.4$, $t = -3.4$, $p < .001$) and connector presence (young: $\beta = 1.2$, $t = 3.3$, $p < .001$, old: $\beta = 0.9$, $t = 2.1$, $p < .05$) significantly interact with the type of relation: While causal relations are hardly affected by the presence of a connector, temporal relations are judged as more coherent when the connector is present – both where there is an underlying temporal relationship and where there is not. This latter finding fits well with the 'causality-by-default'-hypothesis by [4]. By contrast, temporal relationships are perceived more clearly when they are made explicit by a connector – to the extent that participants start seeing temporal successions where none were intended originally. Second sentences were read faster in coherent than incoherent cases (1839 ms vs. 2340 ms, $\beta = 266$, $t = 5.6$, $p < .001$), showing that coherent continuations were easier to integrate with the preceding context. Coherent second sentences were processed faster in causal relations (1739 ms) than in temporal relations (1937 ms, $\beta = -182$, $t = -3.07$, $p < .01$), again supporting causality as default.

References

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Figures and Tables

Coherent	Relation	Sentence1	Sentence2
yes	causal	The man wants to improve his fitness.	(Therefore), he increases his speed.
yes	temporal	The man jogs through the park.	(Then) he increases his speed.
no	causal	The baby is teething.	(Therefore), he increases his speed.
no	temporal	The baby wakes from his nap.	(Then) he increases his speed.

Table 1: Example items – translated from the original German. Connectors in brackets were only shown in the condition with connectors.

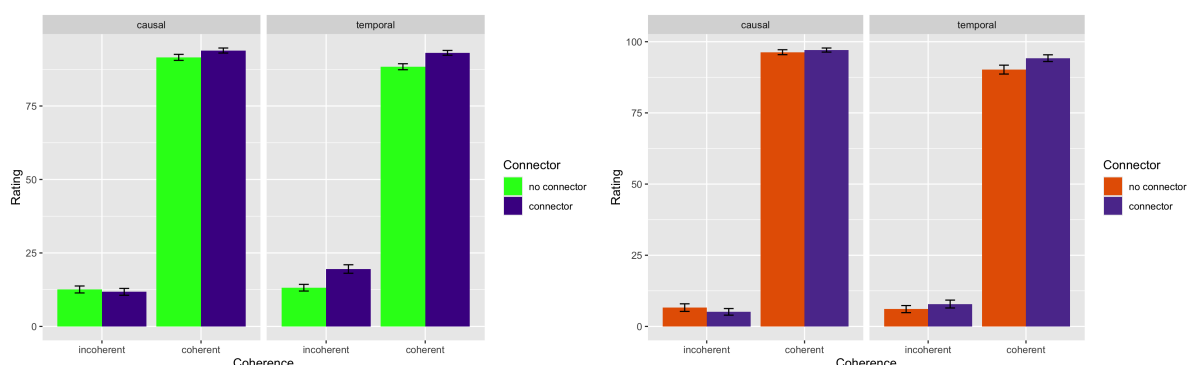


Figure 1: Rating results of the young (left) and old (right) group.

Optional Supplemental Information

Use this optional page for additional technical details if needed.