

A methodological comparison of implicit causality biases between sentence completion tasks and mousetracking

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Implicit causality is a well-established and thoroughly investigated phenomenon (e.g. Garvey & Caramazza, 1974; Caramazza et. al, 1977; Hartshorne & Snedeker, 2012; Kehler & Rohde, 2013, among many others). Many studies provide evidence for anaphoric resolution preferences triggered by implicit causality verbs. The semantics of these interpersonal verbs lacks explanatory content for the actions or attitudes they describe. Interestingly, this lack of missing content leads to specific referential preferences (s. Bott & Solstad, 2014). As seen in (1), some verbs (e.g. stimulus-experiencer verbs) elicit a preference to resolve the ambiguous pronoun to the first-mentioned antecedent (NP1) of the preceding clause while other verbs (e.g. experiencer-stimulus or agent-evocator verbs) trigger coreferential preferences to the second-mentioned antecedent (NP2).

- (1) **Stimulus-Experiencer:** *Ben frightened Bill because he \diamond was screaming.*
Experiencer-Stimulus: *Ben feared Bill because he \diamond was looking quite dangerous.*
Agent-Evocator: *Ben punished Bill because he \diamond had stolen an apple.*

Most of the conducted implicit causality studies employed a sentence completion task (SCT henceforth): participants are asked to complete sentence fragments ending at \diamond . Given the structure of the task that participants in this paradigm have to perform, i.e. interpret the fragment, and produce a completion in accordance with their interpretation, one might wonder whether the preferences found in completion experiments should be traced back to interpretive processes, or whether they mirror production preferences. Most probably, the sentence completion task is a combination of both perception and production (see Kaiser, Li & Holsinger (2011)). This raises the question whether the interpretive component in the SCT can be isolated. This is of particular importance if we assume (following Kehler & Rohde, 2013) that the preferences to attach a pronoun to an antecedent might differ for comprehension vs. production.

We tried to attack this question by performing a comparative meta-analysis of the effects found in SCT data and data from 2AFC-MouseTracking. In this paradigm, complete sentences as the ones in (1) are presented to participants auditorily, and they are asked to decide which of the two antecedents the pronoun refers to by clicking one of two response areas on the screen which are equidistant from the initiation area of the mouse. Among the dependent variables in these experiments are the latency of the decision, as well as the deviation of the mouse path from the straight path to the response box. Given that this paradigm can reasonably be supposed to reflect

comprehension processes, we might ask whether data gathered from MT can be used to factor out the comprehension component in SCT.

72 participants took part in the SCT (Exp. 1) and 32 participant took part in the MT (Exp. 2). In both experiments participants were presented with 36 different sentences (Exp. 2) or sentence fragments respectively (Exp. 1). We used the same verbs for both methods (six verbs for each verb class with every verb presented twice). In Exp. 1 the participants had to complete the sentence after the ambiguous pronoun and in Exp. 2 they heard complete sentences in which the continuation after the pronoun either referred to the bias compliant or to the dispreferred referent. We conducted a correlation analysis between the verb biases in the SCT and the response times (RTs) as well as the maximum deviations (MaxDevs) in the MT. We predicted that if the RTs and MaxDevs of MT reflect perception processes which are part of the process involved in SCT, we should find a correlation between the dependent variables from the two paradigms. This prediction was borne out only for the RTs of the ES verbs, which showed a significant correlation ($p < .05$) with the completion bias from SCT. However, none of the other variables from the two paradigms exhibited significant correlations.

On the poster, we elaborate on this evidence and discuss it in the light of the question of whether, and how different processes are involved in the two paradigms.

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