CSCI 8450 Reading 1

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What is implicit causality? J. Hartshorne
Language, Cognition, and Neuroscience, 2013.

Summary:

In causal dependent clauses, the third-person pronoun is ambiguous in referring to subject or object which is implicitly marked and varied with verb in main clause. This function of identifying referent of third-person pronoun from implicit information of verb in main clause is called implicit causality. Many researchers debated between identifying referent (termed as "re-mention bias" in paper) is based on linguistic structure or high-level non-linguistic cognition. In this paper, author reviewed theories based on linguistic structure and high level non-linguistic cognition. Implicit causality in linguistic structure is mainly based on interpreting pronouns and completing sentences, this approach is divided into two lines of work (1) analyzing argument structure and (2) discourse structure. In analyzing argument structure, verb argument structure is implicated by categorizing verbs into syntactic frames based on systematic correspondence in meaning. Recently, Hartshorne and snedeker showed that re-mention bias changes systematically with the above mentioned syntactic verb classes. In second line of work, discourse structure theory relates different sentences in text, dialog to a short set of relations which govern discourse, such as Explanation, Result and Parallelism and identifies the referent. But many researchers like Brown and Fish argue that causal attribution (explanations people offer about the cause) reflect high-level cognition and close relationship with implicit causality re-mention biases. In this paper author mentioned that there is no evidence for disproving that there exists little evidence that re-mention and causal attribution involve the same verb biases. There are most widely studied theories on gender and social status of the event participants causal role in implicit causality supports the claim that re-mention bias in high level cognition. In this paper, author is concerned about following questions:

- Is Implicit causality driven by linguistic structure or non-linguistic cognition?
- Brown and Fish causal attribution biases reliably predict implicit causality re-mention biases?
- Does re-mention biases or causal attribution biases are affected by social hierarchy and gender manipulations?
- If there is a lack of relationship between causal attribution biases and re-mention biases is that due to superficial aspects of task designs?
- What the Brown and Fish causal attribution task measures?

To investigate these questions author performed 8 experiments, in Exp 1-4 he explored paired re-mention and causal attribution tasks, Exp (1,3) employs a social hierarchy manipulation and (2,4) a gender manipulation. In Exp (1,2) 24 verbs were chosen among those tested by Hartshorne and Snedeker and in Exp (3,4) 20 verbs were chosen from Ferstl et al and participants were selected via Amazon Mechanical Turk and included if they respond to every trail and had not participated in any other experiment in paper. By this experiments author concluded that on an average of 60% causal attribution biases could predict implicit causality reliably, it was much weaker than assumed in literature. These experiments indicate that social status of the event participant does not affect re-mention bias and has too weak effect on causal attribution biases. To verify if the task design could improve the relation between casual biases and re-mention bias in experiment 5 author replicated experiment 1 re-mention condition using 9-point Likert scales and found no appreciable effect and in experiment 6 author repeats experiment 4 with original Brown and Fish design and results were contrary to expectations, in order to test what actually Brown and Fish measured to claim that implicit causality re-mention biases is a function of non-linguistic cognition author extended with Exp (7,8) with very specific questions asked in their approach and found that relationship between the Brown and Fish task and causal judgements itself has been overstated. By the above results of the theories shows that the argument and discourse structure account has several significant strengths as a scientific theory whereas high-level cognition needs further explanation.