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Title: Causal network analysis validation using synthetic recall protocols
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Abstract: Subjects read and recalled 12 short texts in a memory recall experiment. The order in which subjects recalled the propositions in the text was recorded, A causal network analysis of each text was then done in order to determine how the propositions in each text were causally related. In addition, an episodic memory network analysis of each text was done in order to represent the original order of propositions presented to each subject in the experiment. The human text recall data were then analyzed using a new statistical methodology known as the temporal Markov field (TMF) approach, which makes explicit probabilistic predictions about the ordering of propositions in human subject recall protocols in terms of the causal network and episodic memory network analysis of a given text, Samples from the TMF probability model were then used to generate synthetic protocol data using half of the human subject data. Statistics computed with respect to the remaining half of the human subject data and the synthesized protocol data were qualitatively similar in many respects. Relevant discrepancies between the human protocol data and synthesized protocol data were also identified.
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