

The consequences of suggesting false childhood food events



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ABSTRACT

We combined data across eight published experiments ($N = 1369$) to examine the formation and consequences of false autobiographical beliefs and memories. Our path models revealed that the formation of false autobiographical belief fully mediated the pathway between suggesting to people that they had experienced a positive or negative food-related event in the past and current preference for that food. Suggestion indirectly affected intention to eat the food via change in autobiographical belief. The development of belief with and without memory produced similar changes in food preferences and behavior intention, indicating that belief in the event drives changes in suggestion-related attitudes. Finally, positive suggestions (e.g., “you loved asparagus the first time you tried it”) yielded stronger effects than negative suggestions (e.g., “you got sick eating egg salad”). These findings show that false autobiographical suggestions lead to the development of autobiographical beliefs, which in turn, have consequences for one’s attitudes and behaviors.

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1. Introduction

In *The Hunting of the Snark*, Lewis Carroll noted, “what I tell you three times is true” (Carroll, 1996, p. 680). However, suggesting just once that an event occurred in one’s past suffices to increase the degree to which people believe that the event is true (Mazzoni, Loftus, & Kirsch, 2001). Not only does suggestion make a false event seem true and memorable, false memories have consequences for people’s attitudes and behaviors (Bernstein & Loftus, 2009).

Researchers have proposed that false suggestion produces attitudinal and behavioral consequences via the formation of false autobiographical beliefs and memories (Bernstein, Pernat, & Loftus, 2011; Mazzoni et al., 2001; Scoboria, Mazzoni, Kirsch, & Relya, 2004). Research has shown that merely suggesting to people that they experienced a particular event in the past, for example, that they had become ill after eating spoiled peach yogurt, can directly affect how much peach yogurt they consume currently (Scoboria, Mazzoni, & Jarry, 2008). However, other studies have shown that the consequences surrounding suggested food-related events are stronger in those who come to believe the suggestion than in those who do not believe the suggestion (e.g., Berkowitz, Laney, Morris, Garry, & Loftus, 2008). Thus, it is unclear whether suggestions directly affect suggestion-related attitudes and behaviors or

whether belief in the suggested events drives changes in suggestion-related attitudes and behaviors.

The right-hand side of Fig. 1 depicts a simplified schematic of the Theory of Planned Behavior (Ajzen, 1991). This theory provides a framework for discussing links between preferences, behavior intention, and behavior. The theory proposes that attitudes toward a behavior (in the current work, measured as preference ratings for suggested foods) influence behavior intention (here, measured as intention to eat a suggested food), which in turn influence engagement in the behavior (eating the food). The theory also states that available beliefs linking behavior to outcomes influence attitudes, and that other normative beliefs influence behavior intention (Ajzen, 2002). Thus, it is possible that belief in suggested events will influence suggestion-related attitudes and behavior intention, as depicted in Fig. 1 (pathways b_1 , b_2 , b_3). Alternatively, the effects of suggestion may be direct (pathways c_1 , c_2 , c_3), and the development of belief is irrelevant to suggestion-related attitudes and behavior intention.

To examine these possibilities, we re-analyzed eight published experiments involving the formation and consequences of false autobiographical beliefs and memories. The combined dataset permitted us to disentangle the direct effects of suggestion from indirect effects mediated by belief in the suggested event, which was not possible in the individual studies. The original, smaller studies categorized participants in terms of those who did (“believers”) and did not believe the suggestion (“non-believers”). Such categorization requires assumptions about when false beliefs have and have not developed, and omits substantial

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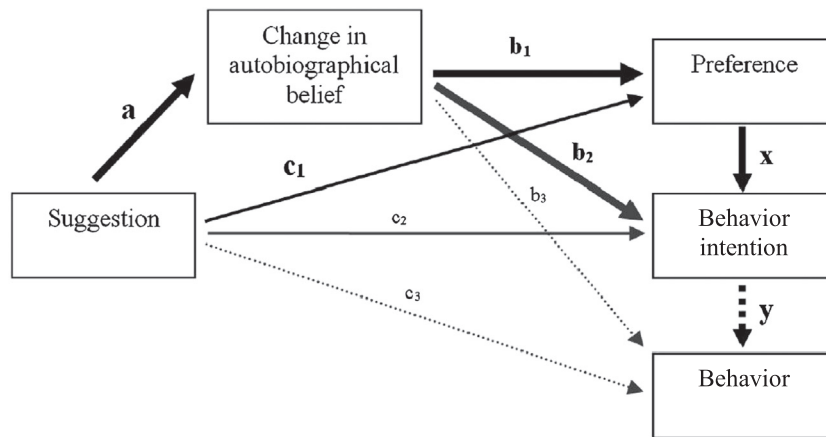


Fig. 1. Theoretical model depicting direct and indirect (mediated by autobiographical belief) links between suggestion and suggestion-related attitudes. The right hand side of the figure depicts the *Ajzen and Gilbert Cote (2008)* model of the influence of attitudes upon behavior intentions (x), which in turn influence behavior (y). Pathway (a) depicts the direct link between suggestion and change in autobiographical belief. Pathway (c_1) depicts the direct link between suggestion and preference ratings (c_2 and c_3 depict direct links with behavior intention and behavior). Pathway (b_1) depicts the indirect link between suggestion and preference via autobiographical belief (b_2 and b_3 depict indirect links with behavior intention and behavior). Solid lines depict pathways that are potentially testable using the current data. Dotted lines depict pathways that are untestable using the current data. Thick lines depict the prediction that the development of autobiographical belief mediates the link between the suggestion and changes in suggestion-related attitudes.

information due to dichotomization of the originally continuous variables, when estimating whether suggestion has affected autobiographical beliefs, attitudes and behavior intention. The method of testing these effects in prior studies was necessitated by the smaller sample sizes in the studies, resulting in insufficient statistical power to treat variables in a continuous manner. Consequently, prior studies have not estimated the magnitude of suggestion's effects on suggestion-related beliefs, attitudes, and behavior intention.

Researchers are also interested in the degree to which suggestive procedures lead to the development of false autobiographical beliefs (belief in the occurrence of the suggested event without accompanying recollection) versus false memories (belief with accompanying recollection). It is unknown whether false beliefs exert as much influence on other attitudes (e.g., preferences, behavior intentions) and behavior relative to the development of false autobiographical memories. Studies that use brief non-elaborative suggestions, such as those used in the current work, produce very few subjective endorsements of memory. Typically researchers must use elaborate and time-intensive procedures to produce detailed and robust false memories (see *Hyman & Pentland, 1996; Loftus & Pickrell, 1995; Otgaar, Scoboria, & Smeets, 2013; Scoboria, Wysman, & Otgaar, 2012* for examples and further discussion; see *Nash, Wade, & Lindsay, 2009* for a method that produces vivid 'miniature' false memories more rapidly). The few false memories that result from the brief suggestions analyzed herein are not amenable to statistical analysis within their single studies. Thus, the relative influence of false autobiographical beliefs versus false memories on other suggestion-related attitudes (preferences for a food following a suggestion about a childhood experience with the food) remains unexplored. Combining studies creates sufficient numbers of false memories to permit comparison with false autobiographical beliefs.

Here, we briefly outline the general procedure used in false food memory studies. Most studies on the consequences of suggesting false food events involve two sessions separated by one week. In Session 1, adult participants complete questionnaires designed to measure their childhood experiences with and current preferences for different foods. In Session 2, participants receive false feedback concerning their Session 1 responses that might lead them to believe that they experienced particular food-related events in their past. Embedded within this false feedback is a critical event denoting either a positive or negative experience, such as "you loved asparagus the first time you tried it" or "you got sick eating egg salad." Participants then complete many of the measures that they completed in Session 1, in addition to questionnaires that measure whether

participants have adopted a memory or belief for the critical event, and their intention to eat the food.

To measure the formation of false food beliefs and memories, researchers assess whether receiving false feedback about a critical food event in childhood increases participants' confidence that they experienced this event in their childhood (pathway a in *Fig. 1*). To measure the consequences of false food beliefs and memories, researchers assess whether receiving false feedback about the food event changes participants' attitudes and behaviors surrounding that food (pathways b_1 , b_2 , and b_3 in *Fig. 1*).

An aspect of the suggestions that varies across studies is whether people receive feedback that they *loved* a food or became *sick* on a food when younger. It is worthwhile to consider whether these suggestions are equally effective. It is possible that positive suggestions are more effective than negative suggestions. For example, true positive autobiographical memories influence intentions and behavior more so than true negative autobiographical memories (*Kuwabara & Pillemer, 2010; Pezdek & Salim, 2011*). Presumably the same should hold for objectively false beliefs or memories, because these are subjectively believed to be genuine. It is also possible that positive and negative suggestions differ in effectiveness because they target different levels of specificity. Telling people that they enjoyed a food is less behaviorally specific than telling them they got sick from that food. *Conway and Pleydell-Pierce (2000)* theorize that memory cues that are more specific place greater constraints on efforts to locate information in memory, which reduces the likelihood of successful retrieval. Building on this argument, *Hessen Kayfitz and Scoboria (2012)* found that false memories are less likely to develop as the information provided with suggestions becomes more specific.

Because we had the original raw data, we conducted a mega-analysis in which we combined the studies into a single dataset. Mega-analysis involves the direct combination of data from multiple studies that have used the same or similar designs and measurement instruments. Mega-analysis has advantages over meta-analysis in that datasets can be combined to enhance statistical power, permitting examination of hypotheses that cannot be tested within single studies. This approach has been used to combine datasets in areas such as genetics (*Whalley et al., 2012*), functional neuroimaging (*Hallahan et al., 2011*), and psychiatric treatment (*de Maat et al., 2008; Thase et al., 1997*). The current study used the combined dataset to address three novel goals: (1) to test the direct versus indirect (mediated by autobiographical belief) effects of suggestion on suggestion-related preferences and behavior intention; (2) to examine the impact of the development

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