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Belief and Emotion Correlates with Changes in Attitude as a Result of Suggestion

Alexander Maurice Wilson

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Belief and Emotion Correlates with Changes in Attitude as a Result of Suggestion

by

Alexander Maurice Wilson

A Thesis

Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Master of Arts
at the University of Windsor

Windsor, Ontario, Canada

2012

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Belief and Emotion Correlates with Changes in Attitude as a Result of Suggestion

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DECLARATION OF ORIGINALITY

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ABSTRACT

Prior research has shown that suggestion can influence believe in the occurrence of the event as well as other attitudes that are related to the object of the suggestion. While researchers have proposed autobiographical belief as a mechanism for the change in attitudes, this hypothesis has not been tested. The current study aimed to determine whether autobiographical belief accounts for the change in attitudes toward a food as a result of suggesting a childhood food-related illness. One hundred and thirty psychology undergraduates participated in the two-part randomized experiment. Contrary to predictions, autobiographical belief did not directly account for the changes in attitude toward the food. In addition, direct and indirect forms of attitude change were observed for the influence of suggestion. The results are discussed in the contexts of altering food attitudes and of the Elaboration Likelihood Model of persuasion.

DEDICATION

I would like to dedicate this thesis to my loving wife Heidi D. Wilson, who has stood by me through thick and thin, who has provided emotional encouragement and motivation, and who has supported me for the two years that it took me to write this thesis. Words cannot express how much I love you and how thankful I am to be with you.

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CHAPTER I

INTRODUCTION

Prior research has demonstrated convincingly that false information can lead some individuals to believe they personally experienced entire events that have not actually occurred (Loftus & Bernstein, 2005). A proportion of these individuals also come to claim a memory for the false event. False beliefs in the occurrence of suggested events have been planted for plausible events such as getting lost in a mall (Loftus & Pickrell, 1995) and implausible events such as meeting Bugs Bunny at Disneyland (Braun, Ellis, & Loftus, 2002). In laboratory studies, false beliefs are planted using suggestive techniques such as providing participants with photographs of them at the alleged event (Wade, Garry, Read, & Lindsay, 2002) or collecting survey data from the individual and then presenting an interpretation of the data that suggests an event occurred in the individual's past (Mazzoni, Loftus, & Kirsch, 2001). This body of research shows that suggestion increases belief in having personally experienced false events, a phenomenon called *false autobiographical belief*.

More recently, research has demonstrated that suggestion-produced autobiographical beliefs have implications for suggestion-related preferences and intentions to perform suggestion-related behaviours. For example, suggesting that one personally became sick as a child after eating a specific food not only increased autobiographical belief, but also reduced preference for the food and reduced intention to eat the food (Bernstein, Laney, Morris, & Loftus, 2005a, 2005b). Also, suggesting that one loved a food as a child the first time the individual tried it not only increased autobiographical belief in the past love for the food, it also increased current preference for the food and intention to eat the food (Laney, Morris, Bernstein, Wakefield, & Loftus, 2008). Moreover, when given the opportunity to consume the offending food, participants who received the suggestion and who believed in the suggestion consumed less of the food compared to participants who had not receive the suggestion (Geraerts, Bernstein, Merckelbach, Linders, Raymaekers, & Loftus, 2008). These studies demonstrate that

suggestion influences more than just autobiographical belief; it also influences related attitudes and behaviours in a suggestion-congruent manner.

The development of autobiographical belief is one frequent explanation that researchers give to explain the influence of suggestion on changes in attitudes and behaviours (e.g., Bernstein et al., 2005a, 2005b; Laney et al., 2008). Specifically, it is assumed that the development of autobiographical belief influences behaviour by altering one's attitudes toward the food (Geraerts et al., 2008; Loftus & Bernstein, 2005). Indeed, the autobiographical belief account shares similarities with attitude theories that propose memory as a causal explanation for attitude formation. For example, Bizer, Tormala, Rucker, and Petty (2006) demonstrated that the valence of an attitude correlates with the valence of the information recalled about the attitude object. The authors induced participants to form a new attitude by having them read a vignette containing 10 sentences with positive information and 10 sentences with negative information about a fictitious target object. Participants then rated how favourably they perceived the target object. Later in the study, participants recalled as many positive and negative details about the target object as they could remember from the vignette. The authors reported that the favourability ratings resulting from reading the vignette were significantly and moderately correlated with the proportion of positive to negative details that were recalled. In other words, as the number of positive details recalled increased compared to the negative details recalled, the resulting attitude ratings were more favourable. As the number of negative details recalled increased compared to positive details, the resulting attitude ratings were less favourable. Since attitudes appear to be formed by the information people recall, autobiographical beliefs might also be a source of information that people use to form attitudes. If belief in the occurrence of a negative food experience were information used to form the attitude, it would increase the proportion of negative details recalled about the food during the attitude rating. Therefore, it is conceivable that autobiographical belief may also result in corresponding changes in attitudes toward the food.

Despite efforts to establish a direct relationship between autobiographical belief and corresponding changes in attitudes toward food, false suggestion studies have produced mixed evidence. In their original study, Bernstein et al. (2005a) demonstrated

that only believers of the suggestion reported less intention to eat a food after being informed that they became sick after eating the food as a child. Bernstein et al. (2005b) investigated whether belief in the illness suggestion could lead to avoidance of fatty foods. During a pilot study, however, the researchers were unable to attenuate intentions to eat potato chips even when participants falsely believed they had become ill after eating the food as children. They interpreted this result to mean that people do not necessarily change their attitudes toward eating common foods even when they believe the food made them sick in their childhood. In other words, change in autobiographical belief should only correspond to attitudes for novel foods. To test this hypothesis, they examined the influence of the illness suggestion on a novel food (strawberry ice cream) and a common food (chocolate chip cookies). The researchers found that after informing participants that they became ill after eating strawberry ice cream during their childhood, those who received the suggestion reported lower preference for the food and less intention to eat the food compared to those who did not receive the suggestion. After the researchers calculated an overall food avoidance score, believers in the suggestion appeared to demonstrate greater intention to avoid the food compared to non-believers and controls. On the other hand, the researchers were unsuccessful inducing autobiographical belief after suggesting that participants became ill after eating chocolate chip cookies, yet those who received the suggestion reported liking chocolate chip cookies less compared to those who did not receive the suggestion. Intentions to eat chocolate chip cookies were unaffected by the suggestion. It is important to note that the failure to induce autobiographical belief for chocolate chip cookies does not explain why participants who believed the suggestion for potato chips did not alter intentions to eat them. In addition, this result of reduced preference for chocolate chip cookies in the absence of autobiographical belief conflicts with the notion that suggestion congruent changes in attitude toward a food are explained by autobiographical belief. In other words, changes in attitude can also occur without autobiographical belief. Overall, this study communicates a mixed message about the relationship of autobiographical belief and corresponding changes in attitude after receiving a suggestion.

Finally, a study by Laney et al. (2008) demonstrated corresponding changes in autobiographical belief and attitudes toward the food in their first experiment, but failed

to demonstrate the same relationship for changes in intention in their second experiment. The experiments reported in this paper examined the influence of a suggestion that the participant loved asparagus as a child the first time they tried it. In the first experiment, the authors included a measure of food preference and a measure of intention to purchase the food. After receiving the suggestion, believers reported an increase in preference for asparagus and an increase in intention to purchase asparagus compared to those who did not receive the suggestion. During their second experiment using the love suggestion, the researchers changed the measure of intention to purchase the food to that of intention to eat the food. After receiving the suggestion, believers increased their preference for asparagus compared to those who did not receive the suggestion, however, intentions to eat asparagus remained unchanged. This development of autobiographical belief without a corresponding change in intention to eat the food does not fit the expected autobiographical belief explanation for changes in attitude. Together, these papers do not demonstrate consistent evidence between the development of autobiographical belief and corresponding changes in attitude toward the food, though both often occur as a result of suggestion.

If attitudes are indeed predictive of behaviour, then two other false suggestion studies demonstrate discontinuity in the expected relationship between autobiographical belief and corresponding behaviour as a result of suggestion (Geraerts et al., 2008; Scoboria, Mazzoni, & Jarry, 2008). Geraerts et al. (2008) suggested to participants that they got sick after eating egg salad. Those who believed the suggestion reported significantly less preference for egg salad and less intention to eat egg salad compared to both non-believers and those who did not receive the suggestion. During a bogus debriefing, participants were given drinks and sandwiches with five different fillings to eat, including egg salad. Surprisingly, both believers and non-believers ate fewer egg salad sandwiches directly after receiving the suggestion compared to participants who did not receive the suggestion. The groups did not differ in their consumption of any of the other types of sandwiches. Only after four months did believers eat fewer egg salad sandwiches compared to both non-believers and those who did not receive the suggestion. Hence the expected influence of suggestion on behavior was not immediately observed, although it did emerge following a delay.

In another study, Scoboria et al. (2008) suggested to participants that they got sick after eating spoiled peach yogourt. After completing an alleged marketing study one week after receiving the suggestion, participants were given the opportunity to consume as much yogourt as they wished. The suggestion did not have a significant effect on autobiographical belief. However, participants who received the suggestion consumed less yogourt compared to participants who did not receive the suggestion. This reduction in consumption as a result of suggestion without a corresponding change in autobiographical belief calls to question whether change in autobiographical belief is necessary for suggestion to produce changes in behaviour. These mixed results imply that something other than autobiographical belief may be causing the reduction in preference for the food and intention to eat the food immediately post-suggestion.

Researchers have proposed a number of explanations for the inconsistent relationship of autobiographical belief with corresponding changes in attitudes toward the food. One explanation is that the correlation of autobiographical belief with attitudes toward the food is conditional on the novelty of the target food item (Bernstein et al., 2005b). Although novelty has been connected with food avoidance under certain conditions (Martins, Pelchat, & Pliner, 1997; Pliner & Pelchat, 1991), the relationship has been explained in terms of belief that eating the food will result in negative post-ingestional consequences (Martins & Pliner, 2005, 2006). In other words, avoidance of an unfamiliar food occurs because the food is believed to taste bad or to potentially make the individual ill. Another explanation that was proposed for short-term food avoidance in the absence of an increase in autobiographical belief was the *contagion effect* – participants who received the suggestion were reminded of what it feels like in general to become ill after eating food (Geraerts et al., 2008). These explanations for the suggestion-attitude and the suggestion-behaviour congruency imply that suggestion might be influencing autobiographical belief while at the same time it influences other beliefs or feelings that are directly relevant to the eating behaviour. It should be noted that one final explanation was proposed to explain food avoidance in the absence of autobiographical belief observed by Scoboria et al. (2008). Since the suggestion that they used included an explicit message that the participant became ill after eating the food supported by an alleged health report dating back to the time period when the alleged event happened, the

authors proposed that the general information in the health report about the food-related illness in the population might have contributed to the avoidance of the food. However, a recent study by Scoboria, Mazzoni, Jarry, and Bernstein (2012) ruled out this explanation. This study tested the relative influence of the suggestion with and without the general information, and found that suggesting that the event occurred to the person alone influenced attitudes toward the food and consumption behaviour. The health report containing general information that others in the population became ill after eating the food had no influence.

Another challenge to interpreting the influence of suggestion on attitudes and behaviours is variability in the type of suggestions used in existing research. The illness suggestions used in the literature are complex and not always consistent. For example, some studies use the suggestion that participants “got sick after eating the food” (e.g., Bernstein et al., 2005a; Geraerts et al., 2008) while other studies use the suggestion “got sick after eating spoiled food” (e.g., Scoboria, Mazzoni, & Jarry, 2008). The inclusion of food spoilage adds the concept of food poisoning to the illness suggestion, which alone may influence avoidance of the food in situations where there is no suggestion of a past event. For example, people who shop for food generally avoid purchasing food that shows any indication of spoilage – food with visible physical blemishes or past expiration dates (Brewer & Prestat, 2002; Grunert, 2005). It is possible that when an individual thinks about an alleged food-related illness, the individual may be reminded of the potential dangers of eating spoiled food. Therefore it is unclear in the aforementioned studies whether the food avoidance was due to autobiographical belief in the suggested event or whether it was a result of being concerned about food poisoning. To date, investigations of alternative pathways by which suggestion may influence attitudes and behaviour intention are missing.

A question that has yet to be raised is how participants interpret the suggestion. Researchers in this area appear to assume that the suggestion is interpreted as a piece of personal history that is used to form the attitude toward the food (e.g., Bernstein et al., 2005a; Loftus & Bernstein, 2005; Laney et al., 2008). However, the illness suggestion could lead people to feel disgusted after imagining being sick as a result of eating the food, it could lead people to focus on the potential risks of eating the food, or it could

alter people's health beliefs in the perceived benefits of eating the food. Considering the different possibilities for interpreting the suggestion, it is difficult to conclude with any certainty that autobiographical belief is the reason why suggestion influences food preferences and intentions to eat the food. It is currently unknown what pathway(s) best explains the effect of food illness suggestion. The present study aims to fill this gap by testing the influence of suggestion on different types of information and by testing whether each type of information accounts for the influence of suggestion on attitudes toward the food.

The Current Study – Development of Research Hypotheses

The Relationship of Attitudes to Behaviour

When investigating the influence of suggestion on eating behaviour, it is important to understand the process by which information influences attitudes and why changes in attitudes are relevant for behaviour. Before beginning this discussion, some terms need to be clarified. In this paper, *attitude* will be discussed in the broader sense of the term to mean a summary evaluation of an *attitude object* – the object that is evaluated (Fazio, 2007). The term evaluation refers not only to an analytic assessment of the attitude object, but also affective reactions to the attitude object. Two forms of attitude that are relevant to this paper are preference and behaviour intention. Whereas *preference* will be used to reflect a general like-dislike evaluation of the attitude object, *behaviour intention* will be used to reflect an evaluation of approach to / avoidance of the food in the context of consuming it. Please note that preference denotes a tendency to consume one food more frequently than another in the context of the eating behaviour literature whereas preference denotes a degree of liking in the context of the attitude literature. To avoid confusion of the meaning of preference, only the latter form (degree of liking) will be discussed in this paper.

Self-reported ratings for statements of preference and behaviour intention are called *explicit attitudes*. Explicit attitudes are evaluations that result from a process of propositional reasoning (Gawronski & Bodenhausen, 2006). Explicit attitudes are formed by an analytic assessment derived from any kind of information that is considered to be relevant for the evaluation (Fazio, 2007; Gawronski & Bodenhausen, 2006). Information that is *salient*, that which is fluently processed or easily comes to mind, during the

evaluative process is more likely to influence self-reported ratings for attitude measures than information that is less accessible (Briñol, Petty, & Tormala, 2006; Tormala, Petty, & Briñol, 2002). And attitudes that are salient during the onset of the behaviour are more likely to influence the behaviour than attitudes that do not readily come to mind (Fazio, 1990). It is this process by which the attitude object is evaluated and the evaluation becomes salient for guiding behaviour that is relevant to the present study of suggestion.

Attitudes are considered to be relatively stable evaluative judgments that are predictive of behaviour (Ajzen & Cote, 2008; Cantin & Dubé, 1999). In essence, attitudes are heuristic constructs that summarize a plethora of information about the object into a single evaluation, facilitating efficiency of behavioural decisions (Fazio, 1990; Zanna & Rempel, 1988). Attitudes are important for food consumption because they summarize food experiences based on many different kinds of information. Such experiences may include perceived sensory characteristics of the food, emotions experienced as a result of ingesting the food, beliefs in the benefits of eating the food, expectations for the ingestion experience, and memories of past experiences with the food (Fazio, 2007; Rozin & Vollmecke, 1986). Moreover, evaluations of the attitude object are based on the most salient information that is evoked by the object within a given context (Fazio, 2007; Gawronski & Bodenhausen, 2006). The relative importance of these various types of information can differ from food to food (Dubé, Cervellon, & Jingyuan, 2003). For example, a person may base their preference for chocolate on sensorial characteristics while basing their preference for milk on its health properties. The relative importance of these types of information can also change as a result of different motivational contexts (Gawronski & Bodenhausen, 2006; Deshpande, Basil, & Basil, 2009). For example, an individual may prefer the taste of ice cream, but intend to eat a carrot because the individual is adhering to a diet. Therefore, it is important to examine the influence of suggestion on preferences independently from the influence of suggestion on behaviour intentions when clarifying the influence of suggestion on food attitudes.

Considering the evidence that suggestion influences both food preferences and intentions to eat the food, it would be logical to assume that the suggestion is also changing the salience of some piece of information on the basis of which the food is evaluated. If the food is evaluated on the basis of past experiences with the object, it is

conceivable that modifying one's autobiographical beliefs about those experiences could result in corresponding changes in preference and behaviour intention (see Zanna & Rempel, 1988). However, if the food is evaluated on the basis of some other type of information, for example taste properties or health benefits, the suggestion may influence attitudes toward the object independently from the influence that the suggestion has on autobiographical belief.

The Autobiographical Belief Hypothesis

There are reasons to suspect that autobiographical belief for a food-related illness is relevant to evaluations of food preference and intention to eat the food. Knowledge about a bad personal experience with the food may help facilitate decisions to avoid similar problems in the future. For example, if drinking milk causes one to experience a stomachache, it would be beneficial to remember this experience so as to avoid future milk-related stomachaches. Therefore, reflecting on one's personal history with the food may provide a basis for the evaluation of the food.

Research on false suggestion supports this proposition that belief in the occurrence of personal events is an important source of information for evaluations of the food. In their initial work on false memory for food experiences, Bernstein et al. (2005a) suggested to participants that as children they had become ill after eating a certain food – either dill pickles or hard-boiled eggs. *Believers*, those who received the suggestion and who endorsed the suggested event as being true, demonstrated less intention to eat the target food of the suggestion compared to participants who did not receive the suggestion. In a replication of the experiment using the illness suggestion, Bernstein et al. (2005b) found that only those who believed in the suggestion demonstrated reduced preference and reduced intention to eat the food. Another study that supports the proposition that autobiographical beliefs are important for evaluations of food preference demonstrated that changes in preference correspond to the valence of the suggestion (Laney et al., 2008). Laney et al. suggested to participants that as young children they “loved to eat cooked asparagus.” Only those who believed in the suggestion indicated that they were more willing to eat asparagus at a restaurant after receiving the suggestion compared to non-believers and participants who did not receive the suggestion. Believers also indicated that they were willing to pay more money for asparagus than both non-believers

and participants who did not receive the suggestion. Together these studies imply that autobiographical belief corresponds to changes in attitudes toward the food in a suggestion congruent manner.

Autobiographical belief is also associated with longevity of the influence of suggestion. Geraerts et al. (2008) replicated the findings of the childhood illness suggestion for egg salad. Believers reported less preference for egg salad and less intention to eat egg salad compared to both non-believers and participants who did not receive the suggestion. When the researchers gave participants the opportunity to eat egg salad sandwiches (along with other sandwiches), receiving the suggestion was associated with eating fewer egg salad sandwiches directly after the suggestion. More importantly, under the same scenario four months after the suggestion, only believers ate fewer egg salad sandwiches. This study implies that autobiographical belief is required for prolonged food avoidance, thereby creating a stable change in attitudes.

One additional study provides support for the autobiographical belief hypothesis. Scoboria, Mazzoni, Jarry, and Bernstein (2012) demonstrated that the suggestion must be personally meaningful in order to influence attitudes toward food and eating behaviour. The researchers examined the relative influence of suggestion that included personalized information, information that could be relevant to everyone, or a combination of both types of information compared to a group of participants that did not receive the suggestion. The researchers observed that only the personalized suggestion led to avoidance of peach yogourt. Participants who received the personalized suggestion reported reduced preference for peach yogourt and, when given the opportunity, ate less peach yogourt than did the participants who did not receive the suggestion. Moreover, participants who received the personalized suggestion were more likely to endorse the suggested event as an autobiographical belief or as a memory compared to all other groups. Those who reported having a memory of the suggested event demonstrated the greatest increases in autobiographical belief and ate significantly less peach yogourt than did participants who did not receive the suggestion. This study demonstrates that only when the suggestion is evaluated as a part of one's personal history does the suggestion influence attitudes toward food and eating behaviour.

Together, this body of research provides evidence that suggestion may influence food preferences and intentions to eat the food by means of autobiographical belief. Following this rationale, the subsequent hypotheses are proposed for autobiographical belief:

H1a: Suggesting a childhood illness after eating a spoiled food will increase ratings of autobiographical belief for having personally experienced the event.

H1b: Autobiographical belief will mediate the influence of suggestion on preference for the food.

H1c: Autobiographical belief will mediate the influence of suggestion on intention to eat the food.

Alternative Hypotheses

While the autobiographical belief hypothesis is a compelling explanation for suggestion-congruent attitudes and behaviours as a result of suggestion, it is not the only possible explanation. Changes in attitudes toward the food could also be explained by feelings or beliefs that are relevant to consumption of the food. In other words, feelings or beliefs activated by the suggestion “got sick after eating spoiled food” may alter ratings of food preference and intentions to eat the food while at the same time suggestion increases belief in the occurrence of the event.

When people are asked why they eat certain foods, they most frequently cite reasons of taste preferences and health benefits (Mooney & Walbourn, 2001; Rappaport, Peters, Huff-Corzine, & Downey, 1992). If an individual interprets the spoiled food suggestion within the context of taste preference or health benefit, the suggestion may cause the individual to think of how the spoiled food tastes or what consequences are related to eating the food rather than to think of the validity of having personally experienced the event. The following sections discuss the potential roles of disgust, health belief, and danger in mediating the relationship between suggestion and attitudes toward the food.

Disgust. Taste preference is frequently cited as a primary motivation for consuming a particular food (Mooney & Walbourn, 2001; Rappaport et al., 1992). However, taste preference for the food can change to feelings of disgust for the food if the individual experiences an event that causes feelings of nausea in association with the food

(Rozin, 1986; de Silva & Rachman, 1987). Many food aversions that develop in childhood are a result of experiencing illness some time after consuming the food. Experiencing nausea is thought to be a critical element in the development of food aversion (Bernstein, 1999; Pelchat & Rozin, 1982). In a review of learned food aversions, Bernstein (1999) argued that food aversion learning occurs when the taste of the food is paired with the sensation of nausea. Food aversions can develop even if the individual knows that the food did not cause the illness (Bernstein, 1999). People with genuine food aversions frequently perceive the objectionable food as disgusting.

Disgust is a complex emotion that is directly related to food rejection. Angyal (1941) defined disgust as revulsion at the prospect of oral incorporation of an offensive object. Disgust is followed by a strong desire to withdraw from the objectionable stimulus (Rozin, Haidt, & McCauley, 2000). The facial actions of disgust, closing of the nostrils and gaping of the mouth, are thought to facilitate oral expulsion of an offensive object that has been ingested. Rozin and Fallon (1987) argued that feeling nausea is the physiological manifestation of disgust after oral incorporation of the food. Besides evaluations of food, disgust emotions also occur in many other contexts, such as viewing graphic images or observing violations of social norms (Oaten, Stevenson, & Case, 2009). Considering that objects of disgust are not always food, Rozin and Fallon (1987) have argued that disgust is an emotion that is a result of ideation – invoked thoughts, images, or knowledge about the object. Indeed, many non-consumable objects of disgust (e.g., pictures of dead bodies, microscopic diseases, violation of social norms) induce similar facial reactions (Chapman, Kim, Susskind, & Anderson, 2009) and activate similar brain regions as those associated with disgust for food (Wright, He, Shapira, Goodman, & Liu, 2004).

Research implies that experiencing nausea directly as a result of eating the food is not necessary for producing an aversion to food; some food aversions occur as a result of intruding thoughts or images evoked by the food (Batsell & Brown, 1998). For example, observing a sibling vomit chicken soup may cause the observer to develop an aversion to chicken soup, despite the fact that the individual did not experience nausea as a result of consuming the food. If the mental image of the chicken soup vomit becomes a salient thought, the individual may feel nauseated due to the mental image and subsequently feel

disgusted with chicken soup. Considering that the false illness suggestion includes an imaginative component, it is possible that merely imagining the experience of getting sick after eating spoiled food can activate feelings of nausea and disgust. The illness suggestions used in many studies explicitly state that the participant “got sick” and then explicitly instruct the participant to imagine the event. Therefore, even if the participant does not believe in having personally become sick after eating the specific food included in the suggestion, most people have been sick on some food at some point, hence imagining the experience of getting sick may activate feelings of disgust, and these feelings may influence attitudes during evaluations of preference for the food and intention to eat the food. Following this rationale, the subsequent hypotheses are proposed for disgust:

H2a: Suggesting illness after eating a food will increase ratings of disgust when thinking about the food.

H2b: Disgust will mediate the influence of suggestion on preference for the food.

H2c: Disgust will mediate the influence of suggestion on intention to eat the food.

Health belief. Apart from taste preference, perceived health benefit is another frequently stated reason for consuming foods (Mooney & Walbourn, 2001; Rappaport et al., 1992). In two separate studies, these researchers asked participants what foods they had eaten and why they chose to eat these foods. Participants frequently indicated that they chose their preferred foods for the sensory characteristics or because the food would improve their health. Some individuals are even willing to sacrifice taste preferences when they believe that they will receive health benefits from eating the food (Verbeke, 2006). Research has demonstrated that evaluations of the food’s healthiness are useful for predicting attitudes toward food (Crites & Aikmen, 2005; Magnusson, Arvola, Hursti, Åberg, & Sjöden, 2003). In one study, health beliefs accounted for up to 40% of the differences in food choices between men and women (Wardle, Haase, Steptoe, Nillapun, Jonwutiwes, & Bellisle, 2004). However, most estimates of the contribution of health belief for predicting individual food preferences demonstrate only a moderate influence of health belief (see Crites & Aikmen, 2005).

When people think about the healthiness of food, they commonly think of the food’s nutritional and vitamin content (Brewer & Rojas, 2008). Self-reported health

beliefs and nutrition evaluations incorporate factors that are related to disease avoidance, weight control, and bodily wellbeing (Furst, Connors, Bisogni, Sobal, & Falk, 1996). Moreover, health beliefs are not tied to objective measures of the food's nutrient values, but rather are global perceptions of the overall subjective health value of the food (Aikman, Min, & Graham, 2006). In other words, health belief is a heuristic that consumers use for evaluating the food's overall quality or benefit for eating it. Although some people allude to health consequences in terms of avoiding certain foods that could harm their bodies or cause disease (a concept that will be discussed later as *danger*), people tend to consider the healthiness of food in more positive terms, such as nutrition, or express it in terms of some general value or quality of the food (Furst et al., 1996).

Prior research has demonstrated that health messages can be assimilated into health beliefs for food when people have little motivation to critically evaluate the message in terms of their personal food beliefs (Liberman & Chaiken, 1992). For example, Liberman and Chaiken (1992) had participants evaluate articles that presented a connection between consuming caffeine and contracting fibrocystic disease. They randomly assigned participants either to read an article that supported the link between caffeine and fibrocystic disease or to read an article that refuted the health link. After reading the article, participants were asked to evaluate the claim that caffeine increases risk of fibrocystic disease. Compared to coffee drinkers, coffee non-drinkers were more likely to increase their belief that caffeine increased the risk of fibrocystic disease whether they read the supporting article or the refuting article. Moreover, coffee drinkers experienced more fear in response to the message compared to non-coffee drinkers. The authors argued that the health message was personally threatening to the coffee drinkers' behaviour; therefore, coffee drinkers were more motivated to reach a conclusion that protected their pre-existing beliefs in coffee and caffeine. On the other hand, coffee non-drinkers assimilated the health threat into their beliefs about coffee because they were unmotivated to refute the caffeine-disease link. These results also imply that if people are unmotivated to bring to mind thoughts that contradict a persuasive message in terms of their personally held health beliefs, they might incorporate the message into their health beliefs about the food.

Experiments designed to investigate the influence of suggestion promote a condition whereby participants may have little motivation to evaluate the suggestion in the context of their health beliefs. In these studies, the instructions for the critical task explicitly request participants to evaluate the suggestion in terms of whether or not the illness event occurred during their childhood. Therefore, it is reasonable to expect that participants are highly motivated to critically evaluate the suggestion in terms of their personal history. On the other hand, the illness suggestion also has an underlying message that links a food with a health consequence – becoming ill. Since participants are busy evaluating the message in terms of their personal history, bringing to mind thoughts that either support or refute the suggestion, it would be reasonable to assume that they have little motivation or cognitive resources left to critically evaluate the suggestion in terms of the health connotations for eating the food. Petty, Wells, and Brock (1976) reasoned that if the dominant response to a persuasive message is to explicitly evaluate both supporting and conflicting evidence for the intended message, then distraction from this evaluation process will lead to greater persuasion – i.e., greater incorporation of the message into the attitude. Therefore, if participants' dominant response to the suggestion is to evaluate supporting and conflicting thoughts for the intended autobiographical message, they may have little cognitive resources left to simultaneously bring to mind thoughts that conflict with the underlying health implication in the message – the association of the food with illness. In other words, the suggestion inadvertently may persuade participants to believe that the food is less healthy than they originally thought.

According to the health belief model, health beliefs influence dietary choices when there is a desire to improve one's state of health, when performing the behaviour is perceived to improve one's health outcome, and when there are no perceived barriers to performing the behaviour (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977; Champion & Skinner, 2008). Using yogourt as an example, research has demonstrated that consuming yogourt helps to boost the immune system and actively helps the body fight gastrointestinal infections (Desobry-Banon, Vetier, & Hardy, 1999). Although the suggestion used does not explicitly state that yogourt failed to provide its typical health benefits, the association of illness with the food may serve as evidence against this health benefit claim and thereby diminish the perception that eating yogourt will improve one's

health outcome. Assuming that the participant is explicitly evaluating the suggestion for supporting and conflicting evidence in terms of autobiographical history, it is less likely that evidence regarding the health claims associated with yogourt will be evaluated.

Without a salient thought for the benefits of eating yogourt, some individuals may have little reason left to consume the food. Following this logic, the subsequent hypotheses are proposed for health beliefs:

H3a: Suggesting an illness resulting from eating a food will decrease beliefs that the food is healthy.

H3b: Health beliefs will mediate the influence of suggestion on preference for the food.

H3c: Health beliefs will mediate the influence of suggestion on intention to eat the food.

Danger. As omnivores, humans have an enormous advantage over many animals: we consume a wide variety of foods. This advantage in food selection, however, is accompanied by risks of ingesting toxins or infectious bacteria. Since there is no way of predicting with complete certainty which foods are safe and which are toxic on the basis of sensory perception, the omnivore must approach foods of unknown origin to maximize the benefits of nutrition, but at the same time quickly learn to avoid foods that will cause illness or death (Rozin, 1987). Humans and other animals demonstrate long-term recollection for illness-causing foods after a single case of illness (Bernstein, 1999; Rozin, 1986). To maximize gains, humans are thought to have evolved an early warning system for alerting them to potential harmful food – the feelings of danger and disgust. Although danger correlates with disgust in many avoidance behaviours, danger may actually precede disgust in the progression toward food avoidance and therefore account for unique variance in the avoidance of harmful substances (Dorfman & Woody, 2011). In some cases of food, danger can be experienced whereas disgust is absent. For example, the poisonous puffer fish is considered to be a delicacy in Japan, yet it can contain a deadly neurotoxin if the fish is not prepared correctly. Eating such a fish can be dangerous while also devoid of feelings of disgust. *Danger* arises from fear that ingesting a food can cause physical harm (Rozin & Fallon, 1987). Harmful consequences may include becoming ill as a result of food allergies or as a result of microbiological

contamination associated with spoiled food. Humans are sensitive to cues in their environment that indicate potentially dangerous foods. In some cases, this sensitivity can become maladaptive such as the case of *food neophobia* – the reluctance to try unfamiliar foods (Pelchat & Pliner, 1995; Pliner & Pelchat, 1991). Food products that originate from animals constitute a special case for the study of danger; not only are such foods highly nutritious, but they are also prone to spoilage and decay (Rozin & Fallon, 1987). As a result, food products of animal origin disproportionately represent the majority of food neophobias (Pliner & Pelchat, 1991).

In this modern age, danger is often associated with the perceived unknown risks of mass food production (Grunert, 2005; Young & Morris, 2006). People are becoming increasingly concerned with dangers of food spoilage and microbiological contamination (Brewer & Rojas, 2008; Wilcock, Pun, Khanona, & Aung, 2004). With recent media coverage of food contamination incidents with E coli, BSE (mad-cow disease), and H5 avian influenza, people are highly sensitive to messages of food-borne illness (Arnade, Calvin & Kuchler, 2009; Wilcock et al., 2004). When people become aware of potential food dangers, they tend to focus on the perceived severity of the danger, rather than the probability of being harmed (Young & Morris, 2006). People manage these perceived dangers by avoiding foods that are thought to be risky. For example, after learning the news that baby spinach had been contaminated by E coli, people across the country quickly avoided all spinach products, rather than only the specific brands that were affected (Arnade, Calvin, & Kuchler, 2009). Despite the fact that the spinach producers were quick to contain the contamination, people were still hesitant to consume spinach even months after the contamination event.

Although the consumption of dangerous foods has important implications for one's health, the absence of danger does not necessarily mean that the food is healthy. For example, eating a bag of potato chips will not immediately harm the individual who consumes it, assuming that the individual is not allergic to its ingredients. Yet few people would ever claim that potato chips are healthy (see Jacobson & Brownell, 2000; Naruszewicz et al., 2009). Even foods that are thought to have tremendous health benefit can be perceived as harmful to one's body. For example, meat is highly nutritious yet it can also be perceived as dangerous to one's health if it is not properly prepared for

consumption (McAffee et al., 2010). Incidences of danger with healthy foods are often associated with microbiological contamination and spoilage (Brennan, McCarthy, & Ritson, 2007). In summary, danger is a perception of risk that the food may directly cause harm or illness, regardless of the nutritional value of the food.

The suggestions used by Scoboria et al. (2008) and Scoboria et al. (2012) explicitly inform participants that they became ill after eating *spoiled* peach yogurt. This inclusion of spoilage may alert some participants to potential dangers of eating the food product in some contexts. Considering that people can be sensitive to messages of a personal food-related threat and assuming that perceived dangers can influence one's preference for a specific food, it is likely that the suggestion may cause some participants to focus on the worst-case scenario – that eating yogurt can potentially cause them to become ill. Following this rationale, the subsequent hypotheses are proposed for danger.

H4a: Suggesting an illness after eating a spoiled food will increase perceptions that the food is dangerous to eat.

H4b: Perceptions of danger will mediate the influence of suggestion on preference for the food.

H4c: Perceptions of danger will mediate the influence of suggestion on intention to eat the food.

Summary of Variables and Predictions

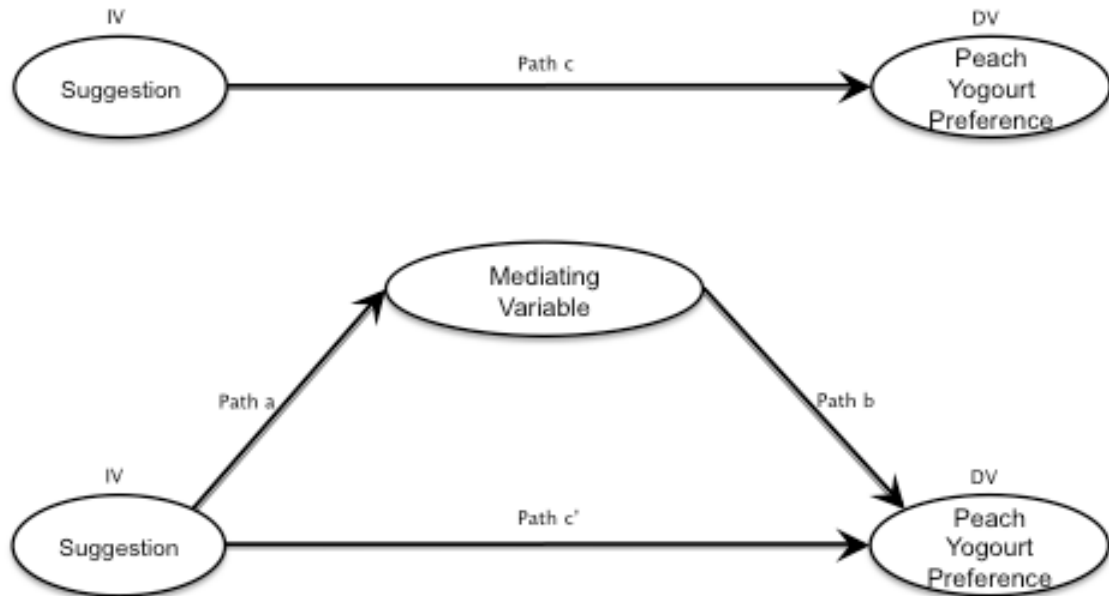
The overarching purpose of the current study is to identify how suggesting a childhood food-related illness influences attitudes toward the food. To accomplish this task, the first goal of this study is to extend prior findings that the illness suggestion influences attitudes toward the food (e.g., Bernstein et al., 2005a, 2005b; Geraerts et al., 2008; Laney et al., 2008) to include multiple types of evaluations that are relevant to attitudes toward the food. Specifically, this study proposes that the suggestion will influence more than just autobiographical belief and attitudes toward the food. It is proposed that suggestion will also increase feelings of disgust and danger while attenuating beliefs that the food is healthy.

The second goal of this study is to test whether autobiographical belief accounts for the changes in attitude toward the food. Specifically, the literature on false autobiographical beliefs predicts that suggesting a childhood food illness will cause

attitudes toward the food to be less favourable, reducing preference for the food and reducing intention to eat the food. However, there are many ways that the suggestion “got sick after eating spoiled food” might be interpreted. While autobiographical belief is a compelling explanation for the influence of suggestion on food preferences and intentions to eat the food, the present study also proposes three alternative types of information that may result from interpreting the suggestion and could potentially account for the change in attitudes toward the food: disgust, health belief, and danger. To answer the question of what information accounts for the influence of suggestion on attitudes toward the food, this study tests each of the four types of information as individual mediators of the influence of suggestion (see Figure 1) on ratings of preference for peach yogourt (see Figure 2) and on ratings of intention to eat peach yogourt (see Figure 3).

Figure 1.

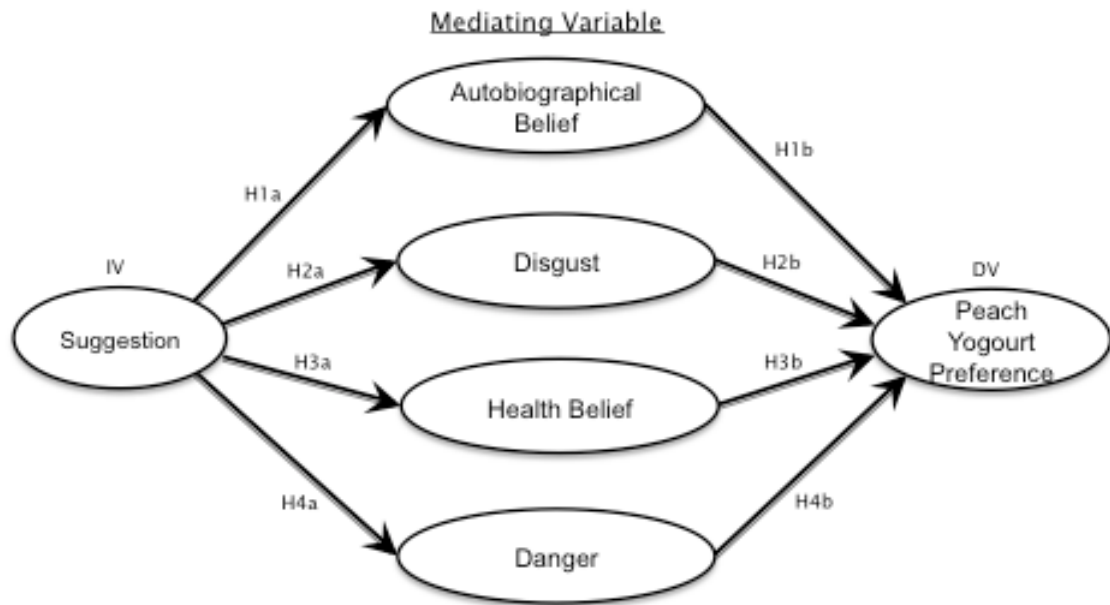
Mediation model for the influence of suggestion on preference



Note. This diagram depicts the mediation relationship between the suggestion and the attitude toward the food. The diagram is based on the Baron and Kenny (1986) mediation model. According to the model, mediation is present when the direct relationship between the suggestion and attitude (Path c) disappears with the inclusion of the mediating variable (Path c'). Each path in this model will be referred to by name (e.g. Path a) in the results of the mediation analyses.

Figure 2

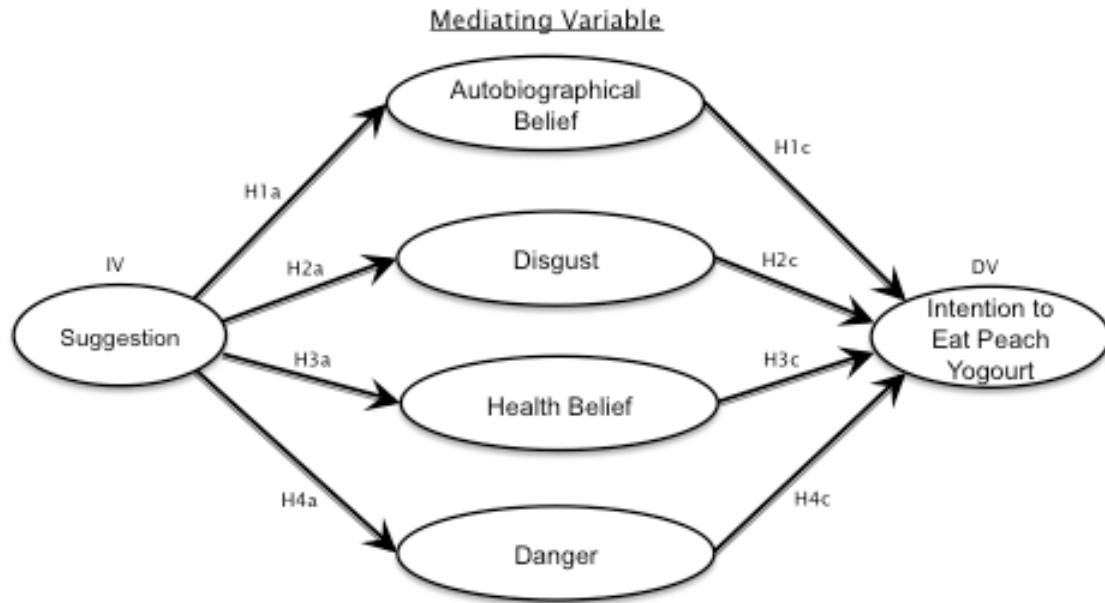
Conceptual model for the influence of suggestion on preference



Note. This diagram illustrates the proposed mediating variables that may account for the influence of suggestion on preference for peach yogourt. Path labels, such as H1a, correspond to the hypothesis number discussed in the reviewed literature.

Figure 3

Conceptual model for the influence of suggestion on intention



Note. This diagram illustrates the proposed mediating variables that may account for the influence of suggestion on intention to eat peach yogurt. Path labels, such as H1a, correspond to the hypothesis number discussed in the reviewed literature.

CHAPTER II

METHOD

Participants

Participants were recruited through the Research Participant Pool for the Department of Psychology at the University of Windsor and received bonus course credit for participating in the study. Before gaining access to the study, participants were screened based on their agreement with the statement “before the age of ten I got sick after eating spoiled yogourt.” Ratings were made on an 8-point scale (1 = definitely did not happen; 8 = definitely did happen). Those who rated their agreement to the screening question below the midpoint of the scale were permitted to participate in the study. Participants were then informed that the study was investigating how life experiences and personality traits influence food preferences. Participants who volunteered for the study completed two surveys, one during an online session and one during an in-lab session approximately one week later. Of the 167 participants who completed the online survey, 131 attended the second session. Those who dropped out of the study after completing the online survey were statistically equivalent to those who completed both parts on all demographic and measured variables ($p < .05$ for all comparisons; see Table 1). In total, 115 females and 15 males between the ages of 18 and 69 ($M=25.36$, $SD=11.25$) were randomly assigned to the “suggestion present” experimental group and “suggestion absent” control group (95 experimental, 35 controls). Assuming that 40% of the participants in the experimental group will develop autobiographical belief for the suggested event, the difference in sample sizes between the experimental group and control group was predetermined in order to afford a comparable number of cases in the believer group, non-believer group, and control group. Both experimental and control groups were statistically equivalent on all demographic and screening criteria ($p < .07$ for all comparisons).

Materials

The following measures were included in the online session, the in-lab session, or both sessions.

Table 1.

Tests of equality of groups for all variables during session one

Variable	Withdrawal (N = 172)	Random Assignment (N = 130)	Final Sample RA (N = 99)
Demographics			
Gender	.428	.607	.533
Ethnicity	.136	.926	.963
Age	.557	.151	.219
Currently dieting	.195	.227	.075
On medications that affect eating	.356	.698	.677
Diagnosed with Eating Disorder	.356	.161	.274
Diagnosed with depression	.997	.799	.790
Athlete in training	.460	.506	.227
Currently pregnant	.055	.382	.375
Dependent Variables			
Preference for peach yogourt	.430	.101	.144
Intention to eat fruit yogourt	.967	.017	.059
Intention to eat sliced peaches	.482	.293	.355
Memory	.650	.074	.962
Autobiographical Belief	.705	.464	.442
Disgust	.360	.480	.381
Health belief	.659	.389	.677
Danger	.745	.642	.698

Note. All values represent p-values for the test of the hypothesis that the groups were statistically equivalent for each of the variables during session 1. Withdrawal is the test of the assumption that participants who withdrew (n = 42) after session 1 were statistically equivalent to those who completed both sessions. Random Assignment is the test of the assumption that the randomly assigned experimental (n = 95) and control (n = 35) groups were statistically equivalent. Final Sample RA is the test of the assumption that the randomly assigned experimental (n = 71) and control (n = 28) groups were statistically equivalent after applying the exclusion criteria. The exclusion criteria used to select the final sample are discussed in the results section.

Autobiographical Belief and Memory Questionnaire (ABMQ) (Scoboria, Mazzoni, Kirsch, & Relyea, 2004). The Autobiographical Belief and Memory Questionnaire asks participants to rate five events for *plausibility*, *personal plausibility*, *belief*, and *memory* on 8-point scales. Each of these variables has been shown to play a role in studies of false autobiographical belief. For example, an event must be considered sufficiently plausible to induce belief (Mazzoni, Loftus, & Kirsch, 2001). And when the event is sufficiently believed, some people report having a memory for the event (see Scoboria et al., 2004). To the extent that participants report having a memory of an event for which they previously denied having a memory, ratings of memory are indirect indications of autobiographical belief.

The Autobiographical Belief and Memory Questionnaire assesses plausibility, belief, and memory for five events: (1) “*getting lost in a shopping mall*,” (2) “*breaking a favorite toy*,” (3) “*getting sick after eating yogurt*,” (4) “*breaking a window with your hand*,” and (5) “*going on a hot air balloon ride*.” Participants rated each event on 8-point scales for general and personal plausibility (1 = *not at all plausible*, 8 = *extremely plausible*), belief (1 = *definitely did not happen*, 8 = *definitely happened*), and memory (1 = *no memory for the event at all*, 8 = *clear and complete memory for the event*). The belief and memory items for “*getting sick after eating yogurt*” were used as indicators of autobiographical belief for the target event. Higher scores on the belief and memory measures indicate greater belief in the occurrence of the suggested event. Participants completed the ABMQ in both the online and in-lab sessions.

Food Preferences Inventory (FPI) (Bernstein et al., 2005a). The Food Preferences Inventory asks participants to rate 62 foods on a 7-point scale (1 = *strong dislike*, 7 = *strong preference*). The “*peach yogurt*” item was used as a direct indicator of preference for peach yogurt. This measure was included for both online and in-lab sessions.

Breakfast Behaviour Questionnaire (BBQ) (Scoboria et al., 2012). The Breakfast Behaviour Questionnaire was adapted from the Party Behaviour Questionnaire used by Bernstein et al. (2005a). The Breakfast Behaviour Questionnaire asks participants to imagine attending a breakfast with 100 people: “You are hungry, so you pick a few

items for your plate. How likely are you to pick each of the choices below?"

Participants then rated 18 different foods on an 8-point scale (1 = *definitely no* and 8 = *definitely yes*). The critical items "*fruit yogourt*" and "*sliced peaches*" were used as indirect indicators of behaviour intention to eat peach yogourt for both online and in-lab sessions.

Food Attitude Questionnaire. Participants also completed a questionnaire that was designed for the present study to assess food-related disgust, health belief, and danger. As discussed in the literature review, disgust is an emotion of revulsion accompanied by nausea at the thought of eating an offensive food. Three items were used to measure the construct of disgust. These items included (1) "*the thought of eating this food makes me nauseated,*" (2) "*I feel disgusted thinking about this food,*" and (3) "*this food is disgusting.*" Health beliefs are defined as global evaluations of the overall health value of the food product and include beliefs about the nutrient and vitamin content of the food. Five items were used to measure the construct of health belief. These items included (1) "*this food is healthy,*" (2) "*I eat this food because it is healthy for me,*" (3) "*eating this food will make me healthy,*" (4) "*this food contains important nutrients,*" and (5) "*this food contains important vitamins.*" Finally, people tend to focus on harmful outcomes when considering food dangers. Three questions were used to measure the construct of danger. These items included (1) "*eating this food is dangerous,*" (2) "*eating this food will expose me to harm,*" and (3) "*eating this food will make me ill.*" Participants were asked to rate their agreement with all eleven items on 7-point scales (1 = *strongly disagree*, 7 = *strongly agree*). The measure was repeated for ten foods including the critical item "*peach yogourt.*" The measure was administered during both the online and the in-lab sessions.

To establish the questionnaire's factor structure for measuring food-related disgust, health belief, and danger, an exploratory factor analysis was conducted using session one data from participants who completed both sessions and who consented to the use of their data. In order to interpret the results of the analysis in terms of food-related attitudes, rather than peach yogourt specific attitudes, aggregate scores for each of the items were used in the analysis. Responses were first collapsed across item ratings for the ten foods to create an aggregate score for each of the eleven items. The data were then

screened for both univariate outliers and multivariate outliers. Both univariate outliers and multivariate outliers that were greater than three standard deviations from the mean were removed from the analysis. A total of eight cases were removed, leaving 122 participants for the factor analysis. The data were then examined for violations of normality for each of the eleven items. The Shapiro-Wilk test indicated significant violations of normality for all three disgust items and three danger items in the questionnaire. Further examination of these items revealed that the distributions were positively skewed and moderately L-shaped. Since the integrity of the factor analysis solution depends on normality (Tabachnick & Fidell, 1989), all variables for disgust and danger were transformed using the reciprocal of the score $1/x$. Although the transformation improved the distributions, as indicated by the skewness statistic, normality remained significantly violated. Linearity was assessed using bivariate scatterplots between the variables and collinearity was assessed using squared multiple correlations. Table 2 shows the squared multiple correlations for each of the items. Assumptions of linearity and collinearity were upheld. Table 3 shows the means, standard deviations, and bivariate relationships for the eleven items.

The Food Attitude Questionnaire variables were then subjected to a factor analysis using the maximum likelihood extraction method and varimax rotation. Table 4 presents the results of the factor extraction. Evidence for a 3-factor structure was based on the Kaiser-Guttman rule with factor eigenvalues above 1 and a significance test of the extracted factors (Tabachnick & Fidell, 1989). Using these criteria, the factor analysis supported a 3-factor solution for this sample (goodness of fit test $\chi^2 = 60.02$, $df = 25$, $p < .001$). The rotated factor loadings presented in Table 5 also supported the conceptual distinction among the three factors. Based on the pattern of rotated factor loadings, factor 1 was named health beliefs, factor 2 was named disgust, and factor 3 was named danger. It is noteworthy to mention that the variable “eating this food will make me ill” cross-loaded between the disgust factor and the danger factor, though it was more heavily weighted towards danger. Each of the three factors demonstrated acceptable reliability for disgust ($\alpha = .94$), health belief ($\alpha = .92$), and danger ($\alpha = .88$). These results support a 3-factor structure of the Food Attitude Questionnaire for disgust, health belief, and danger

Table 2.

Squared multiple correlations for Food Attitude Questionnaire items

1. The thought of eating this food makes me nauseated.	0.81
2. I feel disgusted thinking about this food.	0.88
3. This food is disgusting.	0.82
4. This food is healthy.	0.49
5. I eat this food because it is healthy.	0.58
6. Eating this food will make me healthy.	0.69
7. This food contains important nutrients.	0.81
8. This food contains important vitamins.	0.83
9. Eating this food is dangerous.	0.83
10. Eating this food will expose me to harm.	0.85
11. Eating this food will make me ill.	0.63

Note. Values represent the squared multiple correlation for each item when all other items are used as predictors. Squared multiple correlations greater than .9 indicate multicollinearity. (N = 122)

Table 3.
Food Attitude Questionnaire item descriptives and correlations

Item	Mean	SD	Range	1	2	3	4	5	6	7	8	9	10
Disgust													
1. The thought of eating this food makes me nauseated.	2.02	0.75	1.0 - 4.2										
2. I feel disgusted thinking about this food.	1.98	0.75	1.0 - 3.9	.89***									
3. This food is disgusting.	2.00	0.77	1.0 - 4.2	.78***	.88***								
Health belief													
4. This food is healthy.	4.25	0.59	2.8 - 6.0	.18	.11	.06							
5. I eat this food because it is healthy for me.	3.38	0.75	1.7 - 5.4	.11	.05	.07	.53***						
6. Eating this food will make me healthy.	3.66	0.70	1.0 - 5.2	-.00	-.07	-.04	.64***	.76***					
7. This food contains important nutrients.	4.11	0.79	1.7 - 5.8	-.03	-.09	-.07	.59***	.66***	.81***				
8. This food contains important vitamins.	4.03	0.79	1.6 - 5.7	-.11	-.14	-.09	.57***	.68***	.82***	.90***			
Danger													
9. Eating this food is dangerous.	1.95	0.79	1.0 - 4.2	.48***	.50***	.44***	.16	-.08	-.02	-.09	-.12		
10. Eating this food will expose me to harm.	1.93	0.77	1.0 - 4.3	.50***	.58***	.51***	.03	-.20*	-.22*	-.24**	-.26**	.82***	
11. Eating this food will make me ill.	1.70	0.72	1.0 - 4.2	.55***	.60***	.63***	.07	-.03	-.07	-.07	-.07	.62***	.70***

Note. Reported values are based on aggregate scores of ratings from 10 foods for each item. (N = 122)
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Food Attitude Questionnaire reliability and factor analysis results

Factor	Variable	No. of items	Alpha	% Variance extracted	Eigenvalue	Range of factor loadings
1	Health beliefs	5	.92	39.50	4.35	.67 - .93
2	Disgust	3	.94	33.71	3.71	.85 - .94
3	Danger	3	.88	9.25	1.02	.62 - .89

Note. Goodness-of-fit test χ^2 (25, N = 122) = 60.07, $p < .001$. Factor names were assigned based on item loadings of the rotated factor analysis.

Table 5

Food Attitude Questionnaire factor loadings

Items	Rotated factor loadings		
	1	2	3
Disgust			
1. The thought of eating this food makes me nauseated.	.04	.85	.28
2. I feel disgusted thinking about this food.	-.02	.94	.31
3. This food is disgusting.	.01	.84	.28
Health Belief			
4. This food is healthy.	.67	.08	.13
5. I eat this food because it is healthy.	.75	.11	-.12
6. Eating this food will make me healthy.	.89	-.04	-.06
7. This food contains important nutrients.	.93	-.06	-.08
8. This food contains important vitamins.	.93	-.11	-.08
Danger			
9. Eating this food is dangerous.	.00	.26	.82
10. Eating this food will expose me to harm.	-.17	.32	.89
11. Eating this food will make me ill.	.00	.43	.62

Note: Item loadings for the factor analysis are based on aggregate measures of ten foods for each item. (N = 122)

as being distinct constructs of food evaluation. The final scores for each factor used in the analyses were calculated using the mean of each factor's items.

Memory or Belief Questionnaire (MBQ), Bernstein et al., 2005a). The Memory or Belief Questionnaire was included as a measure only for the in-lab session. This questionnaire is frequently used in investigations of false autobiographical belief to differentiate believers in the suggestion from non-believers. The questionnaire asks participants to indicate whether they had a specific memory for the event before age ten for five different events, including the target event. Participants wrote “*M*” if they have a specific memory for the event, “*B*” if they believed the event happened but had no specific memory for it, or “*P*” if they were positive that the event did not happen. After indicating whether the event was a memory, belief, or did not happen, participants wrote down the rationale for their answer. This measure was used to classify participants as believers or non-believers in the childhood illness suggestion for peach yogurt.

Additional Measures. Two unrelated measures were used to enhance the credibility of the cover study during the online session. These included a 24-item Food History Inventory (Bernstein et al., 2005a) and a 36-item questionnaire assessing common phobias.

Procedure

Session 1 – Baseline measures. When participants volunteered for the study, they received an email with a hyperlink to the online survey. The email included the following instructions: “Dear [Full Name], this email is sent to invite you to complete the online survey. When you first enter the survey, please read the informed consent form before continuing. If you wish to withdraw from the survey for any reason, just close the browser window and cancel your timeslot on the Participant Pool. Click [Invite Link] now to enter the online study. Thank you for participating in the Food & Personality study.” Upon clicking the link, the participant's Internet browser opened to the informed consent page of the online survey. After agreeing to the conditions of the informed consent procedure, participants were invited to complete the online survey. Measures were completed in the following order: demographics, Food Preferences Inventory, phobias questionnaire, Food Attitude Questionnaire, Breakfast Behaviour Questionnaire,

Autobiographical Belief and Memory Questionnaire, and Food History Inventory. The online session took 30 minutes to complete.

Session 2 – Suggestion delivery and posttest measures. Approximately one week after completing session one online, participants arrived at the lab to complete the second session. Upon arriving, participants were informed that the answers they provided during the online survey were used to create a personalized profile of events that were likely to have occurred during their childhood. They were then given a sealed profile package with their name on the envelope, and they were asked to review and evaluate the profile. Participants were randomly assigned profiles illustrating probabilities of having experienced various events before the age of six. The profile presented to participants in the suggestion group informed them that they had a 95% likelihood that they “*became sick after eating spoiled peach yogourt.*” Participants in the control condition received the same profile feedback with the peach yogourt information omitted. To ensure that participants processed all of the information in the profile, all participants were asked to recount a specified event, following a guided imagery exercise to facilitate recall for the event. Then participants were asked to provide details about the context in which the event occurred. The instructions stated “*Imagine the setting in which this experience might have happened. Where were you? Who was with you?*” Participants in the experimental group were asked about the “*became sick after eating spoiled peach yogourt*” event and participants in the control group were asked about the “*enjoyed eating sweets in school*” event. When participants finished writing about the details of their event, they put the profile in a second envelope that was provided in the package.

Participants then completed the posttest survey that included the Autobiographical Belief and Memory Questionnaire, Food Preferences Inventory, Breakfast Behaviour Questionnaire, and Food Attitude Questionnaire. At the end of the survey, participants also completed the Memory or Belief Questionnaire. After finishing the survey, participants put the survey in the second envelope along with the profile, and then on a separate sheet were asked to identify what they believed to be the purpose of the study and what they believed to be important variables in the study. A total of 14 participants who clearly stated the hypotheses to be related to “*persuading people to believe in events*

that did not occur” or “*creating a false memory*” were identified and their data removed from further analysis.

When all materials were completed, participants were fully debriefed verbally and in writing about the nature of and reason for the deception. After being informed, participants were given the opportunity to withdraw their data from analysis, thus allowing for informed participation. One participant exercised his right to withdraw from the study, citing reasons unrelated to the nature of the experimental manipulation. The data from this individual were also excluded from further analyses. Data from 115 participants were included in the following analyses.

CHAPTER III

RESULTS

Overview

The main purpose of the analyses was to determine what information participants use to modify their preference ratings for peach yogourt and ratings of intention to eat peach yogourt after receiving a suggestion about having become sick after eating spoiled peach yogourt. Four factors were proposed as potential pathways for the influence of suggestion: autobiographical belief, disgust, health belief, and danger. The current analysis begins by testing influence of suggestion on each of the outcome variables using ANCOVAs to control for pretest scores. The influence of suggestion was also tested for post hoc differences between believers and non-believers in order to replicate the finding that suggestion results in greater avoidance of the food for believers compared to non-believers (Bernstein et al., 2005b; Geraerts et al., 2008). Finally, separate mediation models were tested to determine the degree to which autobiographical belief, disgust, health belief, and danger separately account for the influence of suggestion on preference ratings for peach yogourt and ratings of intention to eat peach yogourt. All statistical tests were two-tailed unless otherwise specified.

Data Preparation and Manipulation Check

The online session was designed so that participants could not continue until all data fields were answered; therefore, the evaluation of missing data and data entry errors focused on data from the in-lab session. Data were screened for entry errors and missing data. Five participants were missing one item response and one participant was missing two item responses. All missing data were from the Food Attitude Questionnaire. An analysis of the cases of missing data, which is summarized in Table 6, revealed that participants with missing data were more likely to have been diagnosed for depression compared participants who had no missing data (50% cases with missing data versus 10% cases with no missing data; $t = -2.95, p < .01$). However, diagnosis for depression was not related to any of the outcome measures (all $ps > .06$). Considering the number of variables tested, the fact that one secondary variable was not missing at random was deemed acceptable. Participants who had missing data were statistically equivalent to other participants on all other demographic and outcome measures (all $ps > .07$). Since

Table 6

Tests of the assumption that data is missing at random

Variable	<i>p</i> -value
Gender	.37
Age	.62
Ethnicity	.91
Currently dieting	.31
On medication that affects eating	.10
Diagnosed for eating disorder	.62
Diagnosed for depression	.01
Athlete in training	.45
Currently pregnant	.76
Experimental condition	.21
Preference for peach yogourt	.72
Intention to eat fruit yogourt	.58
Intention to eat sliced peaches	.36
Memory for suggested event	.14
Belief in suggested event	.66
Disgust	.37
Health belief	.82
Danger	.69

Note: All values are *p*-values for the test of the assumption that participants who have missing data are equivalent to participants who are not missing data. Participants who were missing data were more likely to have been diagnosed for depression. (N = 115).

the focus of the study was to identify how suggestion modifies preference for a food and intention to consume the food, missing data were assumed to have not changed since the online survey. Thus missing data were recoded with their respective baseline scores. Food Attitude Questionnaire subscale scores were then aggregated using the mean score for each subscale (disgust, health belief, and danger).

Since the childhood event profile was instrumental for suggesting the occurrence of the childhood illness event, write-ups about the suggested event were examined for participant compliance. Examination of the content showed that three participants in the experimental group wrote about a food experience that was not related to either *yogourt* or *peach yogourt*. These participants also were removed from subsequent analyses.

Change score data were then examined for univariate outliers and multivariate outliers. Univariate outliers were identified as scores that were three standard deviations above the mean. A total of eleven cases were identified as univariate outliers on various measures. Considering that the population of interest is a small group of participants who change their autobiographical beliefs, it was assumed that these univariate outlier cases are likely to be representative of the population of autobiographical belief changers. Therefore, instead of removing these univariate outlier cases, the decision was made to examine multivariate outlier cases for potential exclusions from the sample. Multivariate outliers were identified as cases with Mahalanobis distance scores greater than three standard deviations above the sample's mean distance score. Mahalanobis distance scores were calculated separately for the control group and experimental group. Using this procedure, three cases were identified as multivariate outliers. Of these three cases, one case was identified as a multivariate outlier in the control group. A closer examination of this control group outlier revealed that the participant rated every question as four or five mid-way through the online survey. This pattern of responding had distinctly changed from the variability of responses observed from the participant in the first half of the online survey. This change in variability of responses was interpreted to be indicative of survey fatigue, implying that the answers were not likely to reflect the participant's true attitudes. Therefore, the data from the control group multivariate outlier was removed from further analyses. Exploration of the remaining multivariate outliers did not identify any problems with these cases. Removing these multivariate outliers from further

analyses did not alter the pattern of findings. Therefore, these cases were left in the sample. Finally, twelve participants were removed from further analyses for having pretest ABMQ memory scores above the mid-point of the 8-point scale, indicating that these individuals are likely to have had a memory for the event before receiving the suggestion. Following data screening, 99 participants remained in the sample for the final analyses.

To further facilitate examination of the role of belief in potentiating the influence of suggestion on attitudes toward the food, participants in the experimental condition were categorized as either believers or non-believers based on their answers on the Belief or Memory Questionnaire. Specifically, participants were classified as believers if they answered “*B*” or “*M*” on the questionnaire and if they also demonstrated an increase in belief as measured by the ABMQ (see Morris, Laney, Bernstein, & Loftus, 2006). All participants who did not meet these criteria were classified as non-believers. The final sample of 99 consisted of 28 cases in the suggestion absent control condition, 37 cases of non-believers, and 34 cases of believers.

The data from the final sample met all of the assumptions of ANCOVA unless otherwise specified. All hypotheses were tested using dependent variable change scores while controlling for the dependent variable’s respective baseline measures. Aggregate change scores were created for disgust, health belief, and danger variables by first calculating the mean baseline score and the mean posttest score for each variable, and then subtracting the mean baseline score from the mean posttest score. Hypotheses for disgust, health belief, and danger were tested using the mean baseline score for the respective variable as the covariate. All post hoc tests were conducted as two-tailed tests using Bonferroni corrections unless otherwise specified.

Influence of Suggestion

The main hypothesis investigated in this study is that suggesting a childhood food-related illness results in a reduced preference for the food and intention to eat the food. The hypothesis was tested for peach yogourt preference using ANCOVA with peach yogourt preference change scores as the dependent variable and session one peach yogourt preference scores as the covariate. Change scores were calculated by subtracting pretest preference scores from posttest preference scores. Consistent with the prediction,

participants who received the suggestion showed reduced preference for peach yogourt after receiving the suggestion compared to participants who did not receive the suggestion, ($M_{\text{suggest}} = -.38$, $SD_{\text{suggest}} = 1.51$; $M_{\text{control}} = .22$, $SD_{\text{control}} = 1.07$) $F(1, 98) = 3.96$, $p = .05$, $\eta^2_p = .04$. No statistical differences were found for believers and non-believers of the suggestion (both $ps > .17$). Since two indirect measures of intention were used as indicators of intention to eat peach yogourt, the hypothesis was tested separately on change scores for intention to eat fruit yogourt and intention to eat sliced peaches using the respective pretest score as the covariate. No statistical differences were found for either intention to eat fruit yogourt, $F(1, 97) = 1.645$, $p = .43$, or intention to eat sliced peaches, $F(1,97) = 1.59$, $p = .24$, as a result of the suggestion. However, since Scoboria et al. (2012) demonstrated an influence of suggestion on fruit yogourt and a trend for the influence of suggestion on sliced peaches, an aggregate of the two measures may represent a latent measure of intention to eat peach yogourt. To test this hypothesis, an aggregate change score was calculated for intention to eat peach yogourt by subtracting the mean pretest score of the two measures from the mean posttest score of the two measures. The resulting intention score was then subjected to ANCOVA using the pretest aggregate score as a covariate. The analysis failed to reveal a direct influence of suggestion on intention to eat peach yogourt, $F(1, 97) = 3.20$, $p = .08$, $\eta^2_p = .032$. However, it appears that the analysis reveals a trend in the predicted direction, with the participants who received the suggestion showing slightly reduced intention to eat peach yogourt ($M = -.71$, $SD = 1.64$) compared to participants who did not receive the suggestion ($M = -.16$, $SD = .85$). No statistical differences were found for suggestion believers and non-believers when compared to participants who did not receive the suggestion (both $ps > .13$). These results support the hypothesis that suggesting a childhood food-related illness directly influences preference for the food, but do not support the hypothesis that suggestion directly influences intention to eat the target food.

The literature has consistently indicated that receiving a suggestion increases autobiographical belief for the occurrence of the event. To test the hypothesis that suggestion increases autobiographical belief, separate analyses were conducted on ABMQ belief change scores and ABMQ memory change scores using their respective baseline scores as the covariate. The homogeneity of variances assumption was violated

for the memory analysis as indicated by Levene's statistic, $p < .001$. However, since the p -value for the ANCOVA was below .001, it is unlikely that observed significance was due to bias in the test from a violation of homogeneity. Therefore no adjustments were made. The effect of suggestion was replicated for belief, $F(1,96) = 15.91, p < .001, \eta^2_p = .14$, and memory, $F(1,96) = 20.90, p < .001, \eta^2_p = .18$. Participants who received the suggestion showed increases in belief ($M = 1.937, SD = 2.63$) for the event and increases in memory ($M = 2.24, SD = 2.60$) for the event compared to participants who did not receive the suggestion ($M_{\text{belief}} = .02, SD_{\text{belief}} = 1.48; M_{\text{memory}} = -.003, SD_{\text{memory}} = .61$). Believers demonstrated greater increases in belief ($M = 3.38, SD = 1.94$) and memory ($M = 4.01, SD = 2.41$) compared to both non-believers ($M_{\text{belief}} = .23, SD = 1.86, p < .001; M_{\text{memory}} = .61, SD = 1.75, p < .001$) and participants who did not receive the suggestion ($M_{\text{belief}} = .03, SD = 1.48, p < .001; M_{\text{memory}} = -.005, SD = .61, p < .001$). Non-believers were statistically equivalent to participants who did not receive the suggestion in both belief and memory comparisons (both $ps > .44$). These results strongly support hypothesis 1a – suggesting a childhood food-related illness increases autobiographical belief for having personally experienced the event.

One alternative pathway for the influence of suggestion on attitudes toward the food is that the suggestion might decrease the perceived health value of the food. To test this hypothesis, an aggregate health belief change score was calculated using the mean score of the five health belief items for both pretest and posttest ratings, and then subtracting the aggregate pretest score from the aggregate posttest score. The aggregate health change score was then subjected to ANCOVA using the pretest score as the covariate. The hypothesis that suggestion directly influences health beliefs for peach yogourt was upheld, $F(1,97) = 7.26, p = .01, \eta^2_p = .07$. Those who received the suggestion showed reduced health beliefs ($M = -.68, SD = 1.17$) compared to participants who did not receive the suggestion ($M = -.12, SD = .68$). After adjusting for post hoc comparisons using the Bonferroni correction, non-believers ($M = -.68, SD = 1.05$) demonstrated marginally reduced beliefs that peach yogourt is healthy compared to controls ($M = -.12, SD = .68, p = .056$). Believers ($M = -.68, SD = 1.29$) and non-believers ($M = -.68, SD = 1.05$) were statistically equivalent in their change in health belief for peach yogourt ($p = 1.00$). After applying the Bonferroni correction, believers failed to show a significant

decrease in health belief compared to participants who did not receive the suggestion ($p = .07$); however, the results appear to show a trend in the predicted direction. These results strongly support hypothesis 3a – suggesting a childhood food-related illness attenuates belief that the food is healthy.

When preparing the data for analysis, it was discovered that the distributions of responses to Food Attitude Questionnaire statements of disgust and danger were sharply L-shaped with the majority of the responses strongly disagreeing with the statements. Since transforming sharply L-shaped variables has proven largely ineffective for hypothesis tests that assume normality and because using such variables may cause errors in inference (Bradley, 1982), both danger and disgust variables were coded into dichotomous variables and tested using non-parametric statistical tests. Dichotomizing disgust and danger does discard information; however, this was decided to be necessary to provide a valid test of the hypotheses. Before transforming the change scores for the disgust and danger variables, aggregate pretest and posttest scores were calculated for each variable using the mean of their respective items' raw scores. Change scores were then calculated by subtracting the mean raw pretest score from the mean raw posttest score. Recall that lower ratings on the original seven-point scale for danger and disgust indicated disagreement with the statement and higher ratings indicated agreement. For example, low ratings for the statement “this food is disgusting” means that the participant did not feel disgusted with the food. Therefore positive change scores indicate an increase in feelings of disgust for the food. To code both factors, raw aggregate change scores greater than or equal to 2.0 were coded as 1 to indicate an increase in the factor change score. Raw aggregate change scores of 1.9 and lower were coded as 0 to indicate change scores that did not meet this threshold. In other words, a case with a mean raw disgust pretest score of 1.9 was required to have a mean raw posttest score of 3.9 before the disgust change score was coded as 1. Finally, to test for pre-existing disgust and danger, mean raw pretest scores for each variable were transformed using the same coding method previously described. Mean raw pretest scores greater than or equal to 2.0 were coded as 1 and raw mean baseline scores of 1.9 or less were coded as 0.

Before testing hypothesis 2a that suggestion directly influences feelings of disgust for peach yogourt, coded pretest responses were first tested for pre-existing differences in

disgust between participants who received the suggestion and participants who did not receive the suggestion. Participants who received the suggestion were no more likely to feel disgusted toward peach yogourt than were participants who did not receive the suggestion before the suggestion was delivered (30% experimental vs. 25% controls), $\chi^2(1, N = 99) = .205, p = .81$. Moreover, an analysis comparing those who felt disgusted with peach yogourt during the baseline session to those who did not feel disgusted at baseline demonstrated that those who previously felt disgusted were not more likely to increase their feelings of disgust than were those who did not feel disgusted (11% disgusted vs. 10% non-disgusted), $\chi^2(1, N = 99) = .016, p = 1.00$. To test hypothesis 2a that suggestion increases feelings of disgust, a chi-square analysis comparing participants who received the suggestion to participants who did not receive the suggestion indicated that participants who received the suggestion were marginally more likely to increase their feelings of disgust for peach yogourt than were those who did not receive the suggestion (14% suggestion vs. 0% controls), $\chi^2(1, N = 99) = 4.34, p = .058$. However, separate analyses comparing believers to controls and non-believers to controls indicated that neither believers (18% believers vs. 0% controls) $\chi^2(1, N = 99) = 5.25, p = .08$ nor non-believers (11% non-believers vs. 0% controls) $\chi^2(1, N = 99) = 3.18, p = .13$ were more likely than were participants who did not receive the suggestion to report increased feelings of disgust. Therefore the results could only be interpreted in the context of a main effect of suggestion on feelings of disgust. These results partially support hypothesis 2a – suggesting a childhood food-related illness increases feelings of disgust for the food.

Before testing hypothesis 4a that suggestion increases feelings of danger, the coded pretest responses were first tested for pre-existing differences in danger between participants who received the suggestion and participants who did not receive the suggestion. The chi-square analysis indicated that participants who received the suggestion were not more likely to perceive peach yogourt as dangerous than were participants who did not receive the suggestion before the suggestion was delivered (17% experimental vs. 25% control), $\chi^2(1, N = 99) = .84, p = .40$. Moreover, an analysis comparing participants who felt danger for peach yogourt at pretest to participants who did not feel danger at pretest indicated that those who felt danger at pretest were not more likely to increase their feelings of danger than were participants who did not feel danger

at pretest (5% danger vs. 10% non-danger), $\chi^2(1, N = 99) = .41, p = .69$. To test hypothesis 4a that suggestion increases feelings of danger, a chi-square analysis of coded danger change scores comparing participants who received the suggestion to participants who did not receive the suggestion indicated that participants who received the suggestion were marginally more likely to increase their feelings of danger toward peach yogourt than were those who did not receive the suggestion (13% experimental vs. 0% controls), $\chi^2(1, N = 99) = 3.87, p = .057$. Separate post hoc analyses of coded danger change scores comparing believers and non-believers to participants who did not receive the suggestion indicated that believers (18% believers vs. 0% controls), $\chi^2(1, N = 99) = 5.80, p = .052$, were marginally more likely to increase their feelings of danger, but not non-believers (8% non-believers vs. 0% controls), $\chi^2(1, N = 99) = 2.34, p = .25$. These results partially support hypothesis 4a – suggesting a childhood food-related illness increases feelings of danger for the food.

Mediation of Suggestion

The mediation hypotheses were investigated using the series of regression analyses recommended by Baron and Kenny (1988). Each analysis controlled for baseline scores in the outcome and mediating variables. The analyses for disgust and danger used the respective coded change score as a mediator while controlling for pretest scores using the coded pretest scores. The Sobel test (Sobel, 1982) was used to determine whether the path *c'* regression coefficient was significantly reduced by the mediator. An index of the relative magnitude of mediation was calculated as a percent using the ratio of the indirect effect to the total effect calculated as $\text{Percent}_M = \left(1 - \frac{c'}{c}\right) \times 100$ (see Preacher & Kelly, 2011).

To test the various mediation models for the influence of suggestion on peach yogourt preference, a series of regression analyses was conducted using peach yogourt preference change scores as the dependent variable. The results of the mediation analyses for the influence of suggestion on peach yogourt preference are presented in Table 7. Throughout the reviewed literature, autobiographical belief has been invoked as an explanation for the influence of suggestion on changes in food preference. Contrary to expectations, hypothesis 1b was not supported, Sobel $t(98) = 1.14, p = .26$,

Table 7

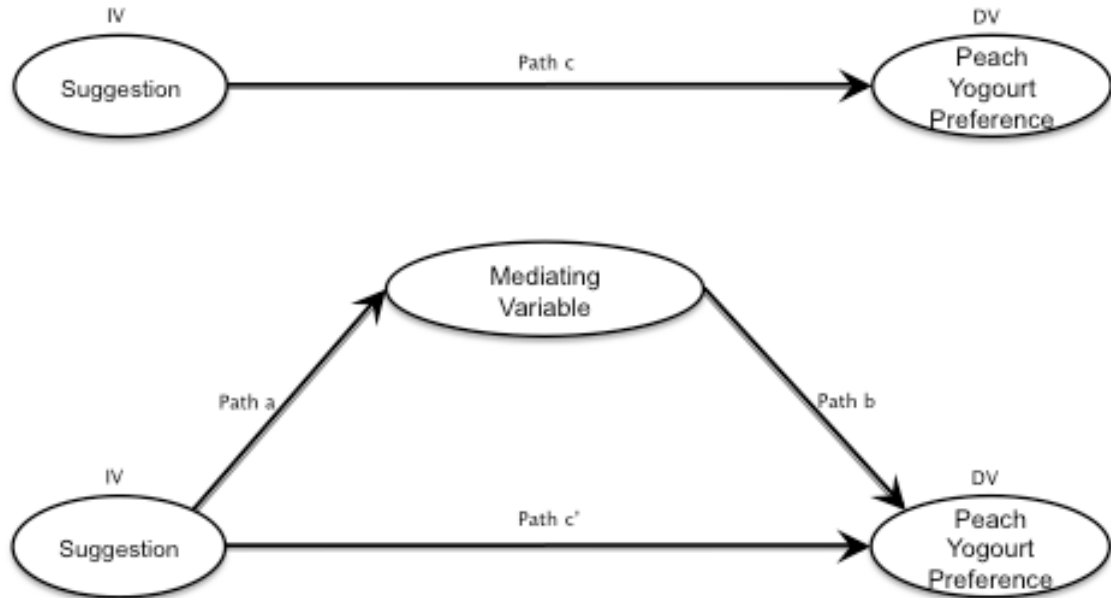
Mediation of suggestion on peach yogourt preference

Mediator	Path	β	t	P -value	ΔR^2	% Mediation
Suggestion	c	-0.19	-1.99	.05	.04	
Autobiographical Belief	a	0.35	3.99	<.001	.12	
	b	0.02	0.15	.88	.00	
	c'	-0.23	-2.20	.03	.05	-23.33
		Sobel =	1.14	.26		
Disgust	a	0.21	2.11	.04	.04	
	b	-0.40	-4.37	<.001	.15	
	c'	-0.11	-1.22	.28	.01	43.23
		Sobel =	-1.91	.06		
Health Belief	a	-0.24	-2.70	<.01	.06	
	b	0.26	2.43	.02	.05	
	c'	-0.15	-1.51	.13	.02	23.44
		Sobel =	-1.81	.07		
Danger	a	0.19	1.94	.06	.04	
	b	-0.31	-3.11	<.01	.08	
	c'	-0.16	-1.68	.10	.02	17.19
		Sobel =	-1.65	.10		

Note: The data are presented in line with Baron and Kenny (1986) mediation analyses. See Figure 4 for a graphical depiction of the model. Although Baron and Kenny argue that mediation can be tested by determining a change in significance from Path c to Path c' after accounting for the mediating variable, statistical significance was determined using the Sobel (1982) method. β represents the standardized correlation coefficient. ΔR^2 represents the unique variance accounted for by the predictor variable in the path. (N = 99)

Figure 4.

Mediation model for the influence of suggestion on peach yogourt preference



Note: The diagram above represents a mediation model for the influence of suggestion on peach yogourt preference. This diagram is based on the Baron and Kenny (1986) mediation model. According to the model, mediation is present when the relationship between the IV and DV (Path c) disappears with the inclusion of the mediating variable (Path c'). Each path in this model will be referred to by name (e.g., Path a) in the results of the Table 4 mediation analyses.

autobiographical belief did not account for the influence of suggestion on food preference. Even though suggestion demonstrated the strongest influence on autobiographical belief, $t(98) = 4.51, p < .001, \Delta R^2 = .17$, no relationship was found between the autobiographical belief and peach yogourt preference after controlling for baseline measures of preference and belief, $t(98) = .153, p = .26$. Also, testing the mediation model using a coding of self-defined belief = 1 and non-belief = 0 as the operational definition for autobiographical belief did not reveal a relationship for autobiographical belief mediating the influence of suggestion peach yogourt preference. Therefore, it was concluded that autobiographical belief did not mediate the relationship of suggestion on preference for peach yogourt.

Disgust was found to mediate the influence of suggestion on peach yogourt preference. The Sobel test for the disgust mediation model indicated that increasing feelings of disgust marginally accounted for the influence of suggestion on peach yogourt preference, $t(98) = -1.91, p = .056$, explaining 43% of the effect of suggestion on preference for peach yogourt. This result was interpreted to provide some support for hypothesis 2b – disgust mediates the influence of suggestion on preference for the food. Changes in health belief failed to mediate the influence of suggestion on preference for peach yogourt, Sobel $t(98) = -1.81, p = .07$. However, these results may indicate a possible trend in the predicted direction. These data provide little support hypothesis 3b – health belief as a mediator for the influence of suggestion on preference for the food. Danger also failed to mediate the influence of suggestion on peach yogourt preference, Sobel $t(98) = -1.65, p = .10$. Again, the results may indicate a possible trend in the predicted direction. Therefore there was little support for hypothesis 4b – danger as a mediator of the influence of suggestion on preference for the food.

To test the various mediation models for the influence of suggestion on intention to eat peach yogourt, a series of regression analyses were conducted using the aggregate peach yogourt change score measure (combining the measures of intention to eat fruit yogourt and intention to eat sliced peaches) as the dependent variable while controlling for pretest aggregate scores of the factor. Table 8 shows the results of the mediation analyses for the influence of suggestion on intention to eat peach yogourt. The same models described previously for the mediation of peach yogourt preference were tested

Table 8

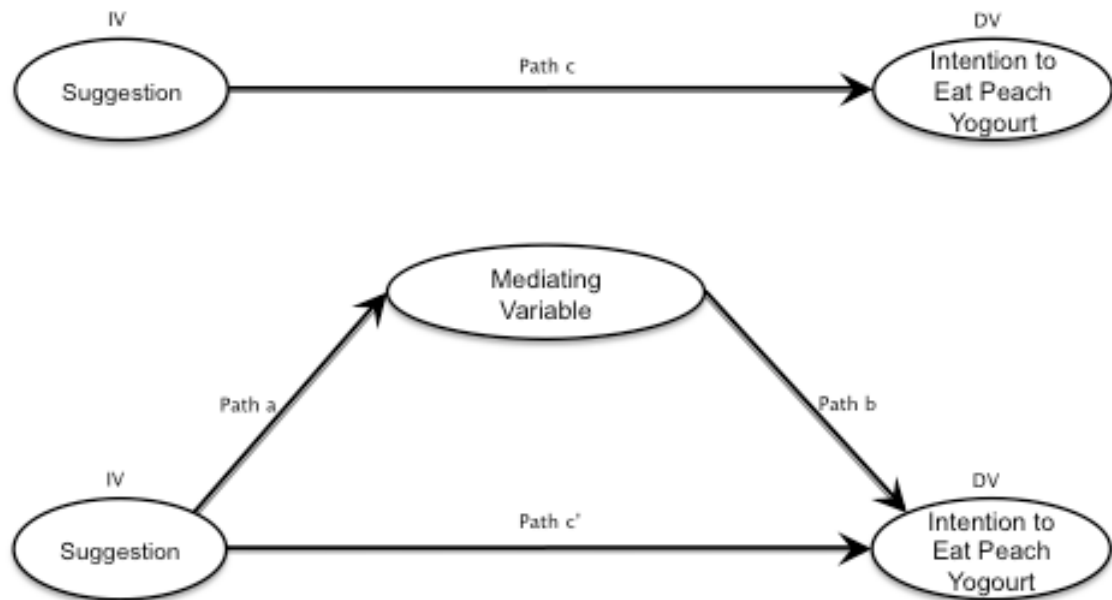
Mediation of suggestion on intention to eat peach yogourt

Mediator	Path	β	t	P -value	ΔR^2	% Mediation
Suggestion	c	-0.17	-1.79	.08	.03	
Autobiographical Belief	a	0.35	3.99	<.001	.12	
	b	0.12	1.20	.23	.01	
	c'	-0.20	-2.21	.03	.04	-18.24
	Sobel =		1.15	.25		
Disgust	a	0.21	-2.11	.04	.04	
	b	-0.34	-3.82	<.001	.11	
	c'	-0.12	-1.34	.18	.01	30.59
	Sobel =		-1.86	.06		
Health Belief	a	-0.24	-2.69	<.01	.06	
	b	0.44	4.52	<.001	.15	
	c'	-0.07	-0.77	.44	.00	58.82
	Sobel =		-2.36	.02		
Danger	a	0.19	1.94	.06	.04	
	b	-0.19	-2.06	.04	.04	
	c'	-0.17	-1.75	.08	.03	2.94
	Sobel =		-1.41	.16		

Note: The data are presented in line with Baron and Kenny (1986) mediation analyses. See Figure 5 for a graphical depiction of the model. Although Baron and Kenny argue that mediation can be tested by determining a change in significance from Path c to Path c' after accounting for the mediating variable, statistical significance was determined using the Sobel (1982) method. β represents the standardized correlation coefficient. ΔR^2 represents the unique variance accounted for by the predictor variable in the path. (N = 99)

Figure 5.

Mediation model for the influence of suggestion on intention to eat peach yogourt



Note: The diagram above represents a mediation model for the influence of suggestion on intention to eat peach yogourt. This diagram is based on the Baron and Kenny (1986) mediation model. According to the model, mediation is present when the relationship between the IV and DV (Path c) disappears with the inclusion of the mediating variable (Path c'). Each path in this model will be referred to by name (e.g., Path a) in the results of the Table 5 mediation analyses.

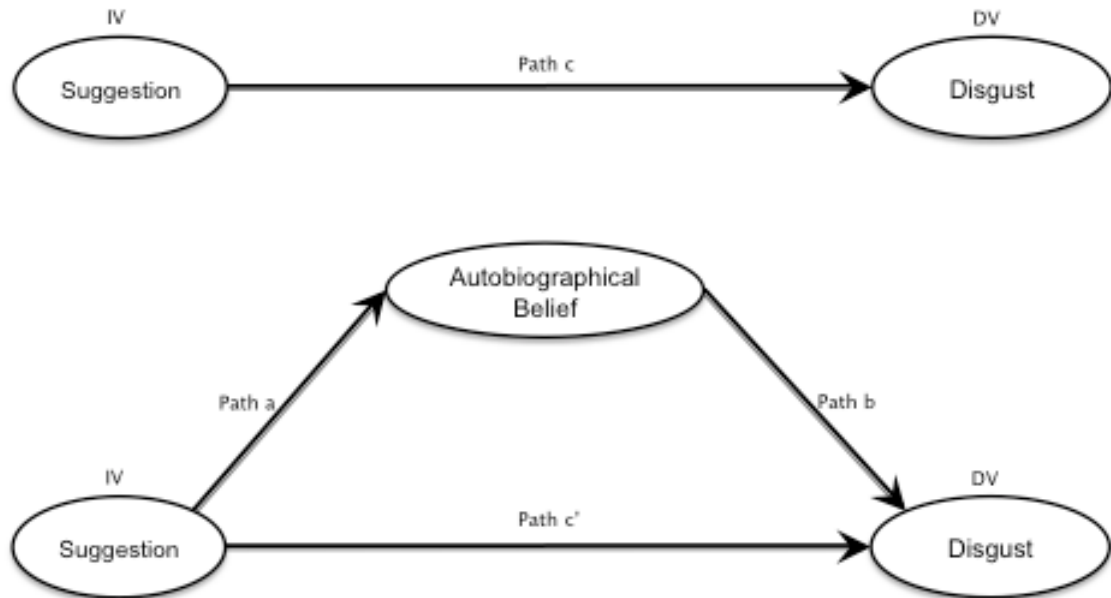
for the intention to eat peach yogourt hypotheses. Again contrary to expectations, autobiographical belief failed to mediate the influence of suggestion on intention to eat peach yogourt, Sobel $t(98) = 1.15, p = .25$. Therefore, hypothesis 1c was not supported – autobiographical belief did not account for the influence of suggestion on intention to eat the food. The test for the disgust mediation model failed to mediate the influence of suggestion on intention to eat peach yogourt, $t(98) = -1.86, p = .06$. However, the results may indicate a trend in the predicted direction. Thus, there was little evidence to support hypothesis 2c – disgust as a mediator for the influence of suggestion on intention to eat the food. The most conclusive finding was observed with the health belief mediation model. Changes in health belief significantly mediated the influence of suggestion on intention to eat peach yogourt, $t(98) = -2.36, p = .02$. Changes in health belief accounted for 59% of the influence of suggestion on intention to eat peach yogourt. These results were interpreted as strong support for 3c – health belief mediates the influence of suggestion on intention to eat the food. Danger did not mediate the influence of suggestion on intention to eat peach yogourt, Sobel $t(98) = -1.410, p = .16$. Therefore hypothesis 4c was not supported – danger did not account for the influence of suggestion on intention to eat the food.

Mediation of the Influence of Suggestion on Alternate Pathways

The finding that autobiographical belief failed to account for changes in attitudes toward the food was surprising when considering prior studies that found this relationship (e.g., Geraerts et al., 2008; Scoboria et al., 2012). This inconsistency was thus interpreted as a failed replication of prior work. One possible explanation for this failed replication is that autobiographical belief may account for the influence of suggestion on changes in disgust, health belief, and danger. To test this post hoc hypothesis, autobiographical belief was tested in separate models as a mediator for the influence of suggestion on disgust, health belief, and danger (see Figure 6). The analyses were conducted using the respective change scores as the dependent variable while controlling for the pretest scores. Following similar procedures previously described for change scores in the disgust factor and the danger factor, the coded change scores were used as the dependent variable for disgust and danger. Table 9 presents the results of the analyses.

Figure 6

Mediation model for the influence of suggestion on disgust, health belief, and danger



Note: The example diagram represents a model of autobiographical belief as a mediator for the influence of suggestion on disgust. This diagram is based on the Baron and Kenny (1986) mediation model. According to the model, mediation is present when the relationship between the IV and DV (Path c) disappears with the inclusion of the mediating variable (Path c'). Each path in this model will be referred to by name (e.g., Path a) in the results of the Table 6 mediation analyses.

Table 9

Belief as a mediator for suggestion on disgust, health belief, and danger

Variable	Path	β	t	P -value	ΔR^2	% Mediation
Disgust	a	0.35	3.99	<.001	.12	
	c	0.21	2.11	.04	.04	
	b	0.19	1.72	.09	.03	
	c'	0.16	1.49	.14	.02	23.81
	Sobel		1.59	.11		
Health Belief	c	-0.24	-2.69	.01	.06	
	b	-0.06	-0.60	.55	.00	
	c'	-0.25	-2.57	.01	.05	-4.24
	Sobel		-0.59	.56		
Danger	c	0.19	1.94	.06	.04	
	b	0.22	2.05	.04	.04	
	c'	0.14	1.29	.20	.02	27.84
	Sobel		1.84	.07		

Note: The data are presented in line with Baron and Kenny (1986) mediation analyses. See Figure 6 for a graphical depiction of the model. Although Baron and Kenny argue that mediation can be tested by determining a change in significance from Path c to Path c' after accounting for the mediating variable, statistical significance was determined using the Sobel (1982) method which simultaneously tests Path a and Path b. β represents the standardized correlation coefficient. ΔR^2 represents the unique variance accounted for by the predictor variable in the path. (N = 99)

Little evidence was found to support the hypothesis that autobiographical belief mediates the influence of suggestion on increases of disgust, Sobel $t(98) = 1.59, p = .11$. However, the results appear to show a trend in the predicted direction. Autobiographical belief did not mediate the influence of suggestion on changes in health belief, Sobel $t(98) = -.59, p = .56$. However, autobiographical belief marginally mediated the influence of suggestion on feelings of danger, $t(98) = 1.84, p = .07$. This influence accounted for 28% of the effect of suggestion on feelings of danger. Although it appears that autobiographical belief might mediate the relationship of suggestion on feelings of danger, at this time the hypothesis is not fully supported.

CHAPTER IV

DISCUSSION

The first goal of this present study was to replicate the finding that suggesting a childhood food-related illness influences attitudes toward the food, and to extend these findings by testing the influence of suggestion on evaluations of disgust, health belief, and danger for the food. The results demonstrated that suggesting a childhood food-related illness reduced preference for the target food. Unlike prior research that found greater food avoidance in believers than in non-believers (e.g., Bernstein et al., 2005b, Geraerts et al., 2008; Laney et al., 2008), the present study demonstrated that the food preferences of both believers and non-believers were equally affected by the suggestion. Also, the suggestion was shown to have only a marginal influence on intention to eat the food. This result is a limited replication of prior work that demonstrated corresponding changes for intentions to eat the food (e.g., Bernstein et al., 2005b; Geraerts et al., 2008). The results of the analysis examining the effect of suggestion on autobiographical belief were in line with those of prior studies (e.g., Bernstein et al., 2005a, 2005b; Geraerts et al., 2008; Laney et al., 2008). Nearly half of the participants in the experimental group (48%) were convinced in this study that as a child they had become sick after eating spoiled peach yogourt. A new finding in this present study is that suggesting a childhood food-related illness attenuates beliefs that the food is healthy, whether or not the suggestion is believed to have occurred. This result extends prior work by demonstrating that suggesting a childhood food-related illness influences evaluations of health belief for the food. Finally, the present study also demonstrated that the illness suggestion marginally increases feelings of disgust and danger. These results provide a limited extension to prior work by demonstrating that the illness suggestion influences feelings that are related to the target food.

The second goal of this present study was to test whether autobiographical belief accounts for the corresponding changes in attitudes toward the food. Contrary to expectations that autobiographical belief would explain the change in food preference and intention to eat the food (e.g., Geraerts et al., 2008; Laney et al., 2008), the present study

failed to demonstrate this relationship. It may be possible that the lack of relationship observed in this study was due to a failed replication with non-believers demonstrating statistically equivalent changes in ratings of preference for the food and ratings of intention to eat the food compared to believers. Often studies of suggestion have found that those who believe in the occurrence of the suggested event demonstrate greater changes in preference for the food compared to non-believers (Bernstein et al., 2005a, 2005b; Geraerts et al., 2008; Laney et al., 2008; Scoboria et al., 2012). Thus, it was expected that a replication would show food avoidance in believers while showing no change for non-believers. However, the tests for autobiographical belief mediation of the influence of suggestion on food preference and intention to eat the food failed to detect an explanatory relationship.

The present study offers a potential explanation for the lack of replication for prior autobiographical belief correlations with attitudes toward the food – autobiographical belief might account for the influence of suggestion on feelings of danger and disgust, thereby indirectly affecting attitudes toward the food. The current analyses tested the post hoc hypotheses that autobiographical belief mediates the influence of suggestion on disgust, health belief, and danger. Autobiographical belief was found to be a marginally statistically significant mediator for danger. Although the analyses failed to detect significant mediation for the influence of suggestion on disgust, the results indicate a potential trend with autobiographical belief accounting for 24% of the influence of suggestion on disgust and 28% of the influence of suggestion on danger. Since the autobiographical belief-danger model was marginally statistically significant, one might interpret this to mean that the particular suggestion used in this study led believers to anticipate getting sick from eating the food in the future. While this is purely speculative, the observed results imply that the relationship of autobiographical belief with corresponding changes in food-attitude typical of prior studies may be partially explained by changes in the feelings of danger and disgust that the suggestion evokes when one comes to believe in the occurrence of the event. In cases where autobiographical belief is present yet there is no observable change in attitude (e.g., potato chips, Bernstein et al., 2005b), the suggestion may not have evoked an emotion strong enough to overcome initial feelings toward the food. More research is required to see whether tailoring the

suggestion to increase feelings of danger or disgust will replicate the autobiographical belief observed in the Bernstein et al. (2005b) study.

The final goal of this present study was to identify whether other explanations could account for the change in food preference and intention to eat the food. This study reviewed three sources of information by which the suggestion may influence evaluations of food: disgust, health belief, and danger. Disgust was found to marginally mediate the influence of suggestion on food preference, accounting for 43% of the influence of suggestion on preference ratings for peach yogurt. On the other hand, health belief was clearly found to mediate the influence of suggestion on intention to eat the food, accounting for 59% of the influence of suggestion on ratings of intention to eat peach yogurt. Contrary to expectations, the present experiment was unable to detect any mediating influence of danger for either preferences or intentions to eat the food. These results illustrate a complex influence of suggestion on attitudes toward food whereby suggesting a childhood food-related illness directly influences autobiographical belief in the event, autobiographical belief potentially mediates the influence of suggestion on feelings of disgust and danger, disgust mediates preference for the food, and the suggestion indirectly influences intention to eat the food by altering perceptions of health belief.

It is worth noting that while the suggestion makes direct reference to autobiography, disgust, and danger, no reference is made to the health value of the food. Nonetheless, health beliefs are affected by the suggestion. Understanding this indirect influence of suggestion may give researchers insight into some of the inconsistent results in prior studies. It is speculated that health belief, unmeasured in the prior work, may have influenced the effects of suggestion on preferences and behavioral intentions. For example, Bernstein et al. (2005b) reported that the illness suggestion did not increase autobiographical belief for becoming sick after eating chocolate chip cookies, yet those who received the suggestion reported lower preference ratings for chocolate chip cookies. This result may be explained partially in terms of the influence of suggestion on health beliefs. The analyses in the present study demonstrated that health belief potentially mediates some of the influence of suggestion on preference ratings. Therefore, the association of chocolate chip cookies with getting sick could have indirectly lowered

preferences in the Bernstein et al. (2005b) study because while participants were busy debating the autobiographical argument in their minds, they may have inadvertently incorporated the underlying health message into the attitude toward the food.

Another finding about this indirect effect of suggestion was that the majority of the influence of suggestion on intentions to eat the food was explained by changes in health beliefs. Again, this indirect influence of suggestion could help explain some of the conflicting result in prior studies. For example, Scoboria et al. (2008) observed a reduction in food consumption in the absence of autobiographical belief. This result could be explained by the indirect influence of the suggestion on health beliefs for peach yogurt. In addition, Geraerts et al. (2008) observed that both believers and non-believers in the illness suggestion for egg salad consumed fewer egg salad sandwiches. Whereas believers may have been directly influenced by means of autobiographical belief, non-believers may have been influenced indirectly through their health belief for egg salad.

The hypothesis that suggestion is indirectly influencing intentions to eat the food and consumption behaviour directly after receiving the suggestion leads to another paradox – why did Bernstein et al. (2005b) observe that the illness suggestion influenced preference ratings, but did not reduce intentions to eat chocolate chip cookies? One reason for this may be that chocolate chip cookies are not consumed for health benefits. Bernstein et al. (2005b) also reported that the illness suggestion induced autobiographical belief in having become sick after eating potato chips, but intentions to eat potato chips were unaffected. Assuming the suggestion did affect health beliefs for potato chips, the lack of change in intention to eat the food might also be explained by the fact that people do not eat potato chips for their health benefits. Thus, one answer to inconsistencies in prior research for the influence of suggestion on intentions to eat the food may be found in whether or not the indirect influence of suggestion affects the primary reason for eating the food. More research will be needed to directly test this hypothesis.

How does suggestion influence autobiographical belief in the event and corresponding changes in attitudes toward the food?

One explanation that has been proposed for the influence of suggestion on autobiographical belief as well as attitudes toward the food is that suggestion increases the salience of thoughts and feelings that are used to evaluate questions of

autobiographical belief and questions of food preference (Laney et al., 2008). Specifically, the authors proposed that suggestion might prime participants to think of the food more fluently in the context of the event, leading participants to perceive ease of thought as an indication that the event truly happened. This ease of thoughts and feelings for the event could then be used to evaluate the food either as liking or disliking. The fluency argument has similarities to the concept of attitude formation proposed by Fazio (2007). Evaluations of the attitude object depend on the context of the evaluation as well as salient thoughts and feelings that are evoked by the object during the evaluation (Fazio 2007; Gawaronski & Bodenhouse, 2006). Thus, increasing the fluency of a particular thought about an object could influence one's attitude toward the object. Such fluency effects are known to occur as a result of persuasive communication only under conditions of high elaboration (Briñol, Petty, & Tormala, 2006; Tormala, Petty, & Briñol, 2002). Therefore, it is conceivable that negative thoughts and feelings that are active during the evaluation of autobiographical belief could also be the same thoughts and feelings used to evaluate preference for the food. This logic is the premise of the fluency argument.

One problem with the fluency explanation is that one should expect the suggestion to have a roughly equal influence on both autobiographical belief and food-related attitudes because the suggestion increases the salience of the same thought of the alleged event for both evaluations. However, the present study demonstrated that effects of suggestion on autobiographical belief are not the same as the effects of suggestion on attitudes toward the food; suggestion has a greater effect on autobiographical belief ($\beta = 0.35$) while having smaller effects on preference for the food ($\beta = -0.19$) and intention to eat the food ($\beta = -0.17$). The results of this present study are consistent with other studies that show corresponding effects of suggestion on autobiographical belief ratings and ratings of preference for the food. For example, Scoboria et al. (2012) reported increases of autobiographical belief over three points, but reported changes in preference of less than one point. Although it is impossible to make direct comparisons of effect size by comparing differences in mean values between these variables, the Scoboria et al. paper provides a sense of consistency for the results of this present study. If fluency was the primary explanation for the influence of suggestion on autobiographical belief and suggestion-congruent changes in attitudes toward the food, we should expect the

influence to be roughly equivalent in both cases. However, since the effects of suggestion appear to differ between autobiographical belief and food-related attitudes, it is unlikely that fluency is the sole mechanism by which suggestion influences both variables.

Why does suggestion influence autobiographical belief more than it influences attitudes toward food?

One reason why the influence of suggestion appears to be consistently greater for autobiographical belief compared to attitudes toward the food could be that the focus of the persuasive message is more proximal to autobiographical belief than to food-related attitudes. Insight as to why this may be the case might be found in the Elaboration Likelihood Model for attitude change (Petty & Cacioppo, 1986). The model proposes two paths by which a persuasive argument may influence attitudes. The first path is the *central route of persuasion*. Attitudes are influenced through the central route when information in the persuasive message is carefully assessed as to its relevance and validity for the attitude it is intending to change. Attitudes that are most likely to be influenced by the central route are those that are the direct focus of the persuasive message, while attitudes that are indirectly related to the central argument are less likely to be influenced. Moreover, the central route has its greatest influence on attitudes when the persuasive message is personally relevant to the individual receiving the message.

The central route of persuasion lends some insight to prior research on suggestion. First of all, attitudes that are influenced by the central route are those that are the focus of the persuasive argument. One interpretation that could be made from this is that the suggestive message “you got sick after eating spoiled yogourt” is the central argument of persuasion. Therefore it would stand to reason that the suggestive message would have the greatest effect on belief for the occurrence of the event. On the other hand, preferences for the food and intentions to eat the food are less central to the argument that one became sick on the food as a child. In other words, one could come to believe that they did become sick on the food as a child, but then evaluate the food in the context of the many years of safely consuming the food after the alleged event. Thus, if persuasion did occur with food preferences, it may be due to some other association that was made as a result of the suggestion rather than the argument that one became sick during childhood.

Another reason why the central route of persuasion lends insight into the influence of suggestion is that the central route requires effortful processing of the argument. Prior research has demonstrated that the suggestion must be personally relevant in order to influence autobiographical belief (Scoboria et al., 2012). Personal relevance is important in the central route of persuasion because people will carefully consider the argument only if they are motivated to process the information (Petty & Cacioppo, 1986). Bernstein et al. (2005b) also argued that elaboration is important to the formation of autobiographical belief. Specifically, the suggestion used in this study explicitly informs participants that they “became sick after eating a spoiled food.” Participants were also encouraged to elaborate on the occurrence of the event in detail. When participants hear this message that is personally relevant, they engage in greater elaborative processing, attempting to recall other related memories that may support this conclusion or may be mistaken for the suggested event. Thus, the central route of persuasion appears to provide a compelling explanation for the direct influence of suggestion on autobiographical belief by linking the suggestion to a personally meaningful and effortful processing of the central argument.

The second path in the Elaboration Likelihood Model is called the *peripheral route of persuasion* (Petty & Cacioppo, 1986). Attitudes that are most likely to be influenced by the peripheral route are those attitudes that are indirectly related to the focus of the persuasive message. These messages that are indirectly related to the focal message could include thoughts and feelings that are evoked by the persuasive argument, but are not critically evaluated in the context of the persuasive argument. When people are either distracted by the central task or unmotivated to process the central message “you got sick after eating spoiled peach yogurt,” elements of the message that are indirectly related to the central argument may be incorporated into the attitude even if they do not believe the event.

The peripheral route explanation may account for the results observed by Scoboria et al. (2008) where the suggestion influenced food preference but not autobiographical belief. The researchers used a suggestion that contained both a message of personal relevance and a message of general relevance in the form of a historic health risk document related to the food. In a following study, Scoboria et al. (2012) ruled out the

influence of general information for causing the change in preference, demonstrating that only the personalized suggestion was required to produce food avoidance. In other words, participants needed to be personally engaged in the act of finding personal evidence as to whether or not the event occurred before the suggestion affects attitudes toward the food. These results do not conflict with a peripheral route of persuasion. For example, Petty, Wells, and Brock (1975) argued that persuasive messages have indirect effects on attitudes because the individual is impeded from thinking of evidence that conflicts with the persuasive message. If the message has more than one potential meaning, the individual may pay attention to the central meaning while being indirectly influenced by other associations or connotations of the message. In other words, participants in the study may have dismissed the suggestion as having personal relevance, but they may still have been indirectly influenced by thoughts that associate the food with a negative health outcome. The central message “you got sick on spoiled peach yogourt” requires participants to evaluate the event in the context of their own personal history, the underlying connotations of health risk in the suggestion may have indirectly evoked thoughts that associate “sick” with “yogourt.” This association could conflict with a former belief that the food is indeed healthy. Because participants are not bringing to mind thoughts that contradict the negative health message, the message is incorporated into the attitude during the evaluative judgment. At a quick glance, the peripheral route of persuasion might appear to offer an explanation for the changes in attitudes toward food.

The results observed in the present experiment are consistent in a number of ways with the Elaboration Likelihood Model. The childhood illness suggestion was observed to influence attitudes toward food, but not to the same degree the suggestion influenced autobiographical belief. If we are to accept that these attitudes are more peripheral than are autobiographical beliefs, then this could imply that the suggestion has an indirect influence on attitudes toward food. In addition, the autobiographical belief explanation leaves a number of unanswered questions in regards to inconsistencies in the influence of suggestion on intentions to eat the food. If we are to accept the idea that the suggestion may have an indirect influence that may or may not relate to the reason the individual consumes the food, the peripheral route of persuasion provides a potential explanation for these discrepancies in findings. Future research could explore the potential role of the

peripheral route of persuasion by including distracter tasks while participants are evaluating the central argument. If persuasion is occurring peripherally, then distraction during the evaluation of the suggestion may lead to an increased proportion of believers and to greater changes in food preference.

Limitations of the Study

A number of issues limit the conclusions that can be reached as a result of the present study. First of all, this study failed to replicate the finding of greater avoidance of the target food in believers compared to non-believers (e.g., Bernstein et al., 2005b; Geraerts et al., 2008; Scoboria et al., 2012). This lack of replication may lower confidence that the results observed in this study are relevant to other studies on the topic of suggestion. However, the present study offers a potential explanation for prior observations of the autobiographical belief-attitude change relationship – autobiographical belief may influence attitudes toward food indirectly by increasing feelings of danger and disgust for the food. Stronger correlations between autobiographical belief and corresponding changes in food attitude may be reached if the suggestion is tailored to elicit feelings of danger and disgust. One method that may accomplish an increase in these feelings is to collect a sample of true emotional memories from the participant during baseline measures and then tailor the suggestion so that it may be easily confused with the true memory. Such a procedure may also increase autobiographical belief while at the same time eliciting stronger emotions.

Another limitation of this study pertains to the Food Attitude Questionnaire measure that was added to the procedures used in prior studies. It is possible that the addition of questions pertaining to feeling disgusted with the food, feeling the food is dangerous, or belief in the healthiness of the food could have altered how participants perceived the study and how participants responded to the suggestion. By answering questions about the reasons why people eat the food, participants could have become more cognizant of their true intentions for eating the food, thereby attenuating the influence of suggestion. This could potentially explain the observed result in this study that the suggestion had little influence on participants' intentions to eat peach yogourt.

A final limitation of the conclusions that can be reached involves the lack of power observed with disgust ratings and danger ratings for peach yogourt. Due to the

extreme positively skewed distribution in these measures, in which the majority of participants reported not feeling disgust or danger for peach yogourt, the statistical methods available for hypothesis testing were restricted to non-parametric tests that do not account for pretest scores. However, the absence of disgust and danger may actually indicate consumer trust in this food. Since yogourt is a food that is commonly consumed in North America, feelings of disgust and danger toward it may be rare and therefore may not be normally distributed in the population.

Two developments might facilitate the detection of disgust and danger for investigations such as this study. First of all, more sophisticated statistical methods need to be developed for testing hypotheses that include changes in the occurrence of rare events. Such methods may include the use of structural equation models to link feelings of disgust and danger induced by the suggestion with changes in preference for the food. Second, indirect measures of disgust and danger may prove to be more fruitful for detecting changes in preference as a result of suggestion. For example, including questions that are less obvious regarding what is being measured may encourage participants to use the full range of the scale. Or the researcher could use implicit measures of disgust and danger that rely on a behavioural response rather than a self-reported rating that can be self-censored (see DeHouwer, Teige-Mocigemba, Spruyt, & Moors, 2009; Schwarz & Bohner, 2001). Future work should explore the use of indirect measures for rarely occurring concepts such as disgust and danger.

Conclusion

The results of this study demonstrate that receiving a suggestion for having experienced a childhood illness as a result of eating spoiled food can indirectly influence attitudes for the target food. Although autobiographical belief is sometimes accompanied by changes in attitudes toward the food, the increase of autobiographical belief appears to be independent of the change in attitudes. Caution should be exercised when interpreting attitudinal correlates to autobiographical belief as a result of suggestion.

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APPENDICES

Appendix A – Screening Measure

Below is a list of events that may or may not have happened to you before you were 10 years old. Please read each event and rate on an 8-point scale how certain you are that the event (or very similar event) did or did not happen to you by circling one of the numbers to the right of the item. Circle the “1” if you are *completely confident* that the event **did not** happen to you before you were 10 years old. Circle the “8” if you are *completely confident* that the event **did** happen to you before you were 10 years old. And, if you are not completely confident, choose one of the middle numbers.

(all items: 1 = Definitely did not happen; 8 = Definitely happened)

Before I turned 10 years of age I _____.

		Definitely did not happen						Definitely did happen	
		1	2	3	4	5	6	7	8
1	Baked a birthday cake	1	2	3	4	5	6	7	8
2	Felt sick after eating airline food	1	2	3	4	5	6	7	8
3	Got sick after eating spoiled yogourt	1	2	3	4	5	6	7	8
4	Ate freshly picked vegetables	1	2	3	4	5	6	7	8

Appendix B – Online Consent Form



Consent to Participate in Research

Title of Study: Food and Personality.

You are being asked to participate in a research study conducted by Alex Wilson, Dr. Alan Scoboria, and Dr. Josee Jarry, from the Psychology Department at the University of Windsor. The results of this study will contribute to the Master's thesis for Alex Wilson. If you have any questions or concerns about the research, please feel to contact Alex Wilson (wilson1e@uwindsor.ca) or Dr. Alan Scoboria by email (scoboria@uwindsor.ca) or phone at 519-253-3000 x4090.

PURPOSE OF THE STUDY

The study aims to identify how life experiences and personality traits influence food preferences.

PROCEDURES

If you volunteer to participate in this study, you will be asked to complete questionnaires online and then answer a few questions in the lab. This study will take no more than 60 minutes to complete.

You may only participate in this study if you have signed up via the Psychology Participant Pool. This study requires completing the on-line questionnaire, and attending the scheduled session approximately one week later.

POTENTIAL RISKS AND DISCOMFORTS

You will be asked about various life events and personality traits in addition to your preferences for various foods.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You may benefit from increased knowledge about research in psychology, as well as learning how you experience food preference. This research will expand knowledge about how people understand and experience food.

COMPENSATION FOR PARTICIPATION

Participants will receive 1 bonus point for 60 minutes of participation towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses. Completion of the on-line component without attending the lab session will result in 0.5 credits.

CONFIDENTIALITY

Any information that is obtained in connection with these studies and that can be identified with you will remain confidential and will be disclosed only with your permission. Your identity is retained solely for the purpose of connecting the data from the on-line and lab sessions. Identifying information is deleted as soon as your data is connected in the dataset. Data are stored securely and can only be accessed by the investigators and members of their research teams.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in these studies or not. If you volunteer to be in these studies, you may withdraw at any time without consequences of any kind. Once your identifying information is

deleted, your data can no longer be withdrawn from the study. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Results will be available in December 2012 at www.uwindsor.ca/reb

SUBSEQUENT USE OF DATA

This data will be used in subsequent studies.

RIGHTS OF RESEARCH SUBJECTS

If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e mail: ethics@uwindsor.ca

CONSENT OF RESEARCH SUBJECT / LEGAL REPRESENTATIVE

I understand the information provided for the study Food and Personality as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study.

By clicking NEXT, I agree to my participation in this study per the terms set out above.

Appendix C – Demographics Questionnaire

What is your gender? Male / Female

What is your ethnicity? _____

What is your age? _____

Are you currently dieting? Yes / No

Are you taking medications that impact eating? Yes / No

Have you been diagnosed for an eating disorder? Yes / No

Have you been diagnosed for depression? Yes / No

Are you an athlete in training? Yes / No

Are you currently pregnant? Yes / No

Appendix D – Autobiographical Belief and Memory Questionnaire

Please complete the following questionnaire about several events.

The first question for each event has to do with how plausible it is that events like this happen to people in general. The second question asks how plausible it is that events like this could happen to you. There are many events that may happen to some people in general but are not plausible for you (e.g. it is very plausible that many people got stung by a hornet when they were younger, regardless of whether they remember it; however, you may have grown up in an area of the world with no hornets and so it is unlikely that this could have happened to you, whether or not it did).

Also, many things happen that people do not remember having happened. People can know something happened to them, without remembering the event (for example, you probably know where you were born, even though you don't remember being born). Therefore, the fourth question asks your belief as to whether you think the event happened to you while the fifth question asks whether you actually remember this event.

Lastly, please keep in mind that all the following events ask questions about events that happen at or before the age of 10...

Event #1 Getting lost in a shopping mall, at or before the age of 10

- | | | | | | | | | | | | |
|----|---|---------------------------|---|---|---|---|---|---|---|---|------------------------------------|
| A. | How plausible is it that at least some people, before the age of 10, get lost in a shopping mall? | Not at all plausible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Extremely plausible |
| B. | How plausible is it that you personally, before the age of 10, could have gotten lost in a shopping mall? | Not at all plausible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Extremely plausible |
| C. | How likely is it that you personally, before the age of 10, did in fact get lost in a shopping mall? | Definitely did not happen | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Definitely did happen |
| D. | Do you actually remember getting lost in a shopping mall before you were the age of 10? | No memory of event at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Clear and complete memory of event |

Event #2 Breaking a favorite toy, at or before the age of 10

- | | | | | | | | | | | | |
|----|--|---------------------------|---|---|---|---|---|---|---|---|------------------------------------|
| A. | How plausible is it that at least some people, before the age of 10, break a favorite toy? | Not at all plausible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Extremely plausible |
| B. | How plausible is it that you personally, before the age of 10, could have broken a favorite toy? | Not at all plausible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Extremely plausible |
| C. | How likely is it that you personally, before the age of 10, did in fact break a favorite toy? | Definitely did not happen | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Definitely did happen |
| D. | Do you actually remember breaking a favorite toy before you were the age of 10? | No memory of event at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Clear and complete memory of event |

Event #3 Getting sick after eating yogourt, at or before the age of 10.

- | | | | | | | | | | | | |
|----|---|---------------------------|---|---|---|---|---|---|---|---|------------------------------------|
| A. | How plausible is it that at least some people, before the age of 10, get sick after eating yogourt? | Not at all plausible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Extremely plausible |
| B. | How plausible is it that you personally, before the age of 10, could have gotten get sick after eating yogourt? | Not at all plausible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Extremely plausible |
| C. | How likely is it that you personally, before the age of 10, did in fact get sick after eating yogourt? | Definitely did not happen | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Definitely did happen |
| D. | Do you actually remember getting sick after eating yogourt before you were the age of 10? | No memory of event at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Clear and complete memory of event |

Event #4 Breaking a window with your hand, at or before the age of 10

A.	How plausible is it that at least some people, before the age of 10, break a window with their hand?	Not at all plausible	1	2	3	4	5	6	7	8	Extremely plausible
B.	How plausible is it that you personally, before the age of 10, could have broken a window with your hand?	Not at all plausible	1	2	3	4	5	6	7	8	Extremely plausible
C.	How likely is it that you personally, before the age of 10, did in fact break a window with your hand?	Definitely did not happen	1	2	3	4	5	6	7	8	Definitely did happen
D.	Do you actually remember breaking a window with your hand before you were the age of 10?	No memory of event at all	1	2	3	4	5	6	7	8	Clear and complete memory of event

Event #5 Going on a hot air balloon ride, at or before the age of 10

A.	How plausible is it that at least some people, before the age of 10, go on a hot air balloon ride?	Not at all plausible	1	2	3	4	5	6	7	8	Extremely plausible
B.	How plausible is it that you personally, before the age of 10, could have gone on a hot air balloon ride?	Not at all plausible	1	2	3	4	5	6	7	8	Extremely plausible
C.	How likely is it that you personally, before the age of 10, did in fact go on a hot air balloon ride?	Definitely did not happen	1	2	3	4	5	6	7	8	Definitely did happen
D.	Do you actually remember going on a hot air balloon ride before you were the age of 10?	No memory of event at all	1	2	3	4	5	6	7	8	Clear and complete memory of event

Appendix E – Food Preferences Inventory

Please rate your preference for each of the following foods:

		Strong Dislike	Dislike	Slight Dislike	Neutral	Slightly Prefer	Prefer	Strongly Prefer
1	Chocolate	1	2	3	4	5	6	7
2	White Bread	1	2	3	4	5	6	7
3	Ice Cream	1	2	3	4	5	6	7
4	Turnips	1	2	3	4	5	6	7
5	Peanuts	1	2	3	4	5	6	7
6	Sushi	1	2	3	4	5	6	7
7	Cereal	1	2	3	4	5	6	7
8	Tomato Soup	1	2	3	4	5	6	7
9	Spaghetti	1	2	3	4	5	6	7
10	Oatmeal	1	2	3	4	5	6	7
11	Strawberries	1	2	3	4	5	6	7
12	Blueberries	1	2	3	4	5	6	7
13	Peaches	1	2	3	4	5	6	7
14	Hot Dog	1	2	3	4	5	6	7
15	Peach Yogourt	1	2	3	4	5	6	7
16	Green Tea	1	2	3	4	5	6	7
17	Lime	1	2	3	4	5	6	7
18	Squash	1	2	3	4	5	6	7
19	Crackers	1	2	3	4	5	6	7
20	Carrot Juice	1	2	3	4	5	6	7
21	Clam Chowder	1	2	3	4	5	6	7
22	Tuna Fish	1	2	3	4	5	6	7
23	Bacon	1	2	3	4	5	6	7
24	Apple Danish	1	2	3	4	5	6	7
25	Potato Chips	1	2	3	4	5	6	7
26	Apple Juice	1	2	3	4	5	6	7
27	Potato	1	2	3	4	5	6	7
28	Vanilla Milkshake	1	2	3	4	5	6	7
29	Tacos	1	2	3	4	5	6	7
30	Orange Juice	1	2	3	4	5	6	7
31	Chocolate Chip Cookies	1	2	3	4	5	6	7
32	Peanut Butter	1	2	3	4	5	6	7
33	1% milk	1	2	3	4	5	6	7
34	Smoked turkey	1	2	3	4	5	6	7
35	Pretzels	1	2	3	4	5	6	7
36	Egg Rolls	1	2	3	4	5	6	7
37	Mango Juice	1	2	3	4	5	6	7
38	Raisins	1	2	3	4	5	6	7
39	Lemon Cake	1	2	3	4	5	6	7
40	Fruit Salad	1	2	3	4	5	6	7

41	Cottage Cheese	1	2	3	4	5	6	7
42	Strawberry Yogourt	1	2	3	4	5	6	7
43	Vanilla Yogourt	1	2	3	4	5	6	7
44	Scone	1	2	3	4	5	6	7
45	Pickles	1	2	3	4	5	6	7
46	Celery	1	2	3	4	5	6	7
47	Hummus	1	2	3	4	5	6	7
48	Blueberry Danish	1	2	3	4	5	6	7
49	Cream Cheese	1	2	3	4	5	6	7
50	Strawberry Milkshake	1	2	3	4	5	6	7
51	Blueberry Yogourt	1	2	3	4	5	6	7
52	Italian Sausage	1	2	3	4	5	6	7
53	Tomato	1	2	3	4	5	6	7
54	Hard Boiled Egg	1	2	3	4	5	6	7
55	Waffles	1	2	3	4	5	6	7
56	Pizza	1	2	3	4	5	6	7
57	Banana	1	2	3	4	5	6	7
58	Chocolate Milkshake	1	2	3	4	5	6	7
59	Cheddar Cheese	1	2	3	4	5	6	7
60	Lemon	1	2	3	4	5	6	7
61	Coffee	1	2	3	4	5	6	7
62	Vegetable Juice	1	2	3	4	5	6	7
63	Peach Nectar	1	2	3	4	5	6	7
64	Salmon	1	2	3	4	5	6	7
65	Whole Milk	1	2	3	4	5	6	7
66	Cupcakes	1	2	3	4	5	6	7

Appendix F – Breakfast Behaviour Questionnaire

Imagine that you are at a morning brunch with 100 guests.

1. After you have found a couple of friends and chatted for a bit, you find yourself near the fruit bar. You are hungry, so you pick a few items for your plate. How likely are you to pick each of the choices below? **(Circle the best answer for each item.)**

	definitely no			maybe			definitely yes		
Sliced pears	1	2	3	4	5	6	7	8	
Grapefruit half	1	2	3	4	5	6	7	8	
Banana	1	2	3	4	5	6	7	8	
Sliced peaches	1	2	3	4	5	6	7	8	

2. Next down the line are the breads and dairy products. You see a toaster, lots of spreads, and bowls for items. How likely are you to pick each of the items below? (Circle the best answer for each item.)

	definitely no			maybe			definitely yes		
Sesame seed bagel	1	2	3	4	5	6	7	8	
White toast	1	2	3	4	5	6	7	8	
Wheat toast	1	2	3	4	5	6	7	8	
Fruit yogourt	1	2	3	4	5	6	7	8	
Cottage cheese	1	2	3	4	5	6	7	8	
Blueberry muffin	1	2	3	4	5	6	7	8	

3. After you've had time to chat with your friends, you wander back to the hot food buffet. The chef is preparing items while you wait. Which of the following are you likely to select for your plate?

	definitely no			maybe			definitely yes		
Scrambled eggs	1	2	3	4	5	6	7	8	
Bacon	1	2	3	4	5	6	7	8	
Vegetarian hash browns	1	2	3	4	5	6	7	8	
Fried tomatoes	1	2	3	4	5	6	7	8	
Smoked salmon	1	2	3	4	5	6	7	8	
Pancakes	1	2	3	4	5	6	7	8	

Appendix G – Food Attitude Questionnaire

Please indicate your agreement with following statements for the following foods.
 For each question, circle the best number for each statement.
 (1 = *strongly disagree*, 7 = *strongly agree*)

Bacon	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Blueberry Muffin	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Scrambled Eggs	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Pickles	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Asparagus	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Peach Yogourt	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Chocolate chip cookies	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Cottage cheese	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Egg Salad Sandwich	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food is dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Ice Cream	Strongly Disagree					Strongly Agree	
This food is healthy	1	2	3	4	5	6	7
Eating this food could be dangerous	1	2	3	4	5	6	7
The thought of eating this food makes me nauseated	1	2	3	4	5	6	7
I eat this food because it is healthy for me	1	2	3	4	5	6	7
This food contains important vitamins	1	2	3	4	5	6	7
Eating this food will expose me to harm	1	2	3	4	5	6	7
I feel disgusted thinking about this food	1	2	3	4	5	6	7
Eating this food will make me healthy	1	2	3	4	5	6	7
This food contains important nutrients	1	2	3	4	5	6	7
This food is disgusting	1	2	3	4	5	6	7
Eating this food will make me ill	1	2	3	4	5	6	7

Appendix H – Suggestion Profile for Experimental Group

Thank you for participating in this study.

You may recall that you completed a series of screening questionnaires on-line recently.

Your answers to the screening questions were compared with a database of responses from thousands of other people. We used this information to create a profile based on your responses about the occurrence of different childhood events.

This is a very good way of determining whether things happened to someone in the past. On the next page is a printout of the results. The information indicates how likely it is that different events occurred. The report shows a range of different events, and the likelihood that a person's responses indicate that an event occurred.

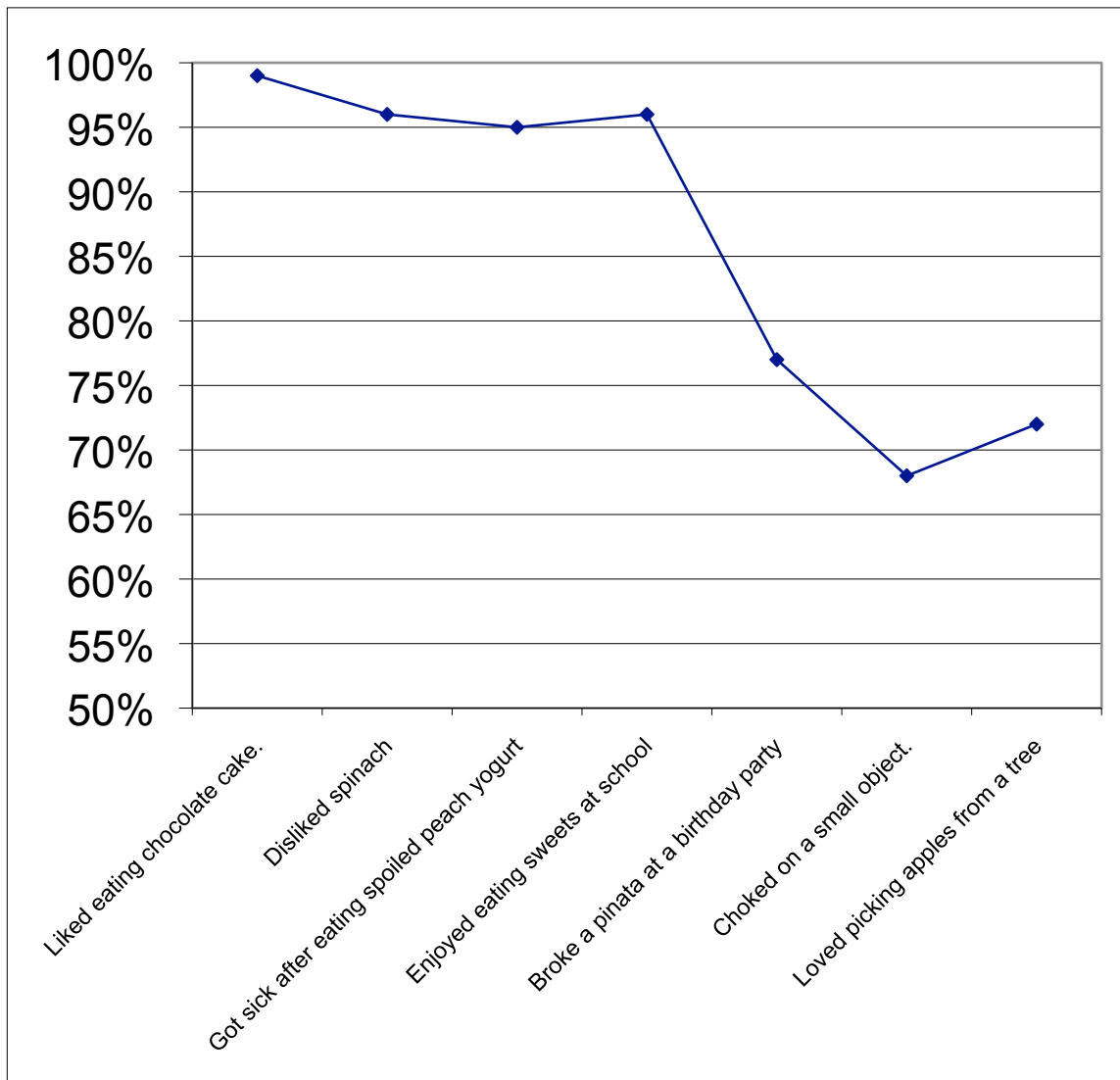
If an event is above 95%, it means that it is very likely that this event occurred to the person in the past. What the report means is that the ones that are high, above 95%, occurred to you. The other events which are lower may or may not have happened to you.

One of the things we are studying is how accurate these reports are, so the information you provide today will be very helpful in improving their quality.

The reason we have invited you is that your profile indicates that one or more of the events that we are interested in happened to you before you were 6 years old.

Please take a minute to study the profile on the next page. Then turn to the next page and follow the instructions.

Based on the information you provided for the online survey, the following graph is a profile of events that you are likely to have experienced before you turned the age of 6. Please examine your profile carefully.



Events that occurred before the age of 6:

- 1) **YOU LIKED EATING CHOCOLATE CAKE**
- 2) **YOU DISLIKED SPINACH**
- 3) **YOU GOT SICK AFTER EATING SPOILED PEACH YOGOURT**
- 4) **YOU ENJOYED EATING SWEETS AT SCHOOL**

End of file.

After you have thoroughly reviewed your profile, please continue to the next page.

Appendix I – Suggestion Profile for Control Group

Thank you for participating in this study.

You may recall that you completed a series of screening questionnaires on-line recently.

Your answers to the screening questions were compared with a database of responses from thousands of other people. We used this information to create a profile based on your responses about the the occurrence of different childhood events.

This is a very good way of determining whether things happened to someone in the past. On the next page is a printout of the results. The information indicates how likely it is that different events occurred. The report shows a range of different events, and the likelihood that a person's responses indicate that an event occurred.

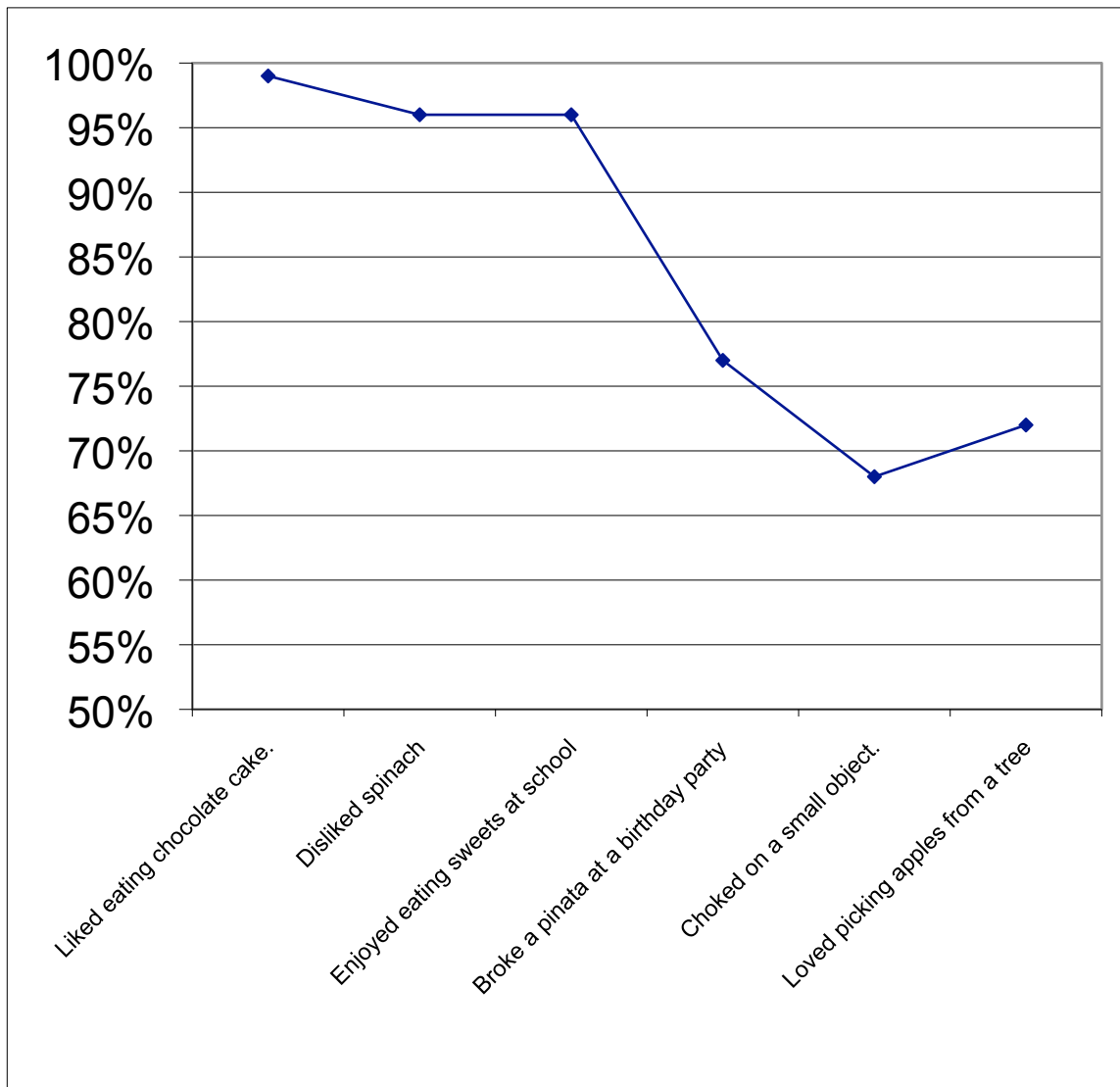
If an event is above 95%, it means that it is very likely that this event occurred to the person in the past. What the report means is that the ones that are high, above 95%, occurred to you. The other events which are lower may or may not have happened to you.

One of the things we are studying is how accurate these reports are, so the information you provide today will be very helpful in improving their quality.

The reason we have invited you is that your profile indicates that one or more of the events that we are interested in happened to you before you were 6 years old.

Please take a minute to study the profile on the next page. Then turn to the next page and follow the instructions.

Based on the information you provided for the online survey, the following graph is a profile of events that you are likely to have experienced before you turned the age of 6. Please examine your profile carefully.



Events that occurred before the age of 6:

- 1) **YOU LIKED EATING CHOCOLATE CAKE**
- 2) **YOU DISLIKED SPINACH**
- 3) **YOU ENJOYED EATING SWEETS AT SCHOOL**

End of file.

After you have thoroughly reviewed your profile, please continue to the next page.

Appendix J – Belief or Memory Questionnaire

Please think about the following events, and evaluate whether you have a specific memory for the event, believe that the event happened but have no specific memory for the event, or if you are positive that the event did not happen. Then rate your confidence in the opinion that you chose. Finally, please indicate your reason for making the selection.

Ratings fore each are:

M = I remember this event (I have a specific memory for this event)

B = I believe this event happened (but I do not have a specific memory for this event)

P = I am positive that this event did not happen

Event #1

Giving a friend a haircut before the age of 10.

Your rating: _____ (M, B, or P)

How confident are you in this selection? ____ (1-10, 1= not confident; 10=extremely confident)

If “M”, please provide as many details as you can about the event in the space below.

If “B”, please provide an explanation of why you believe this event happened in the space below.

If “P”, please provide an explanation of why you know this event did not happen.

Event #2

Getting sick after eating spoiled pickles before the age of 10.

Your rating: _____ (M, B, or P)

How confident are you in this selection? ____ (1-10, 1= not confident; 10=extremely confident)

If “M”, please provide as many details as you can about the event in the space below.

If “B”, please provide an explanation of why you believe this event happened in the space below.

If “P”, please provide an explanation of why you know this event did not happen.

Event #3

Getting lost in a shopping mall before the age of 10.

Your rating: _____ (M, B, or P)

How confident are you in this selection? ____ (1-10, 1= not confident; 10=extremely confident)

If "M", please provide as many details as you can about the event in the space below.

If "B", please provide an explanation of why you believe this event happened in the space below.

If "P", please provide an explanation of why you know this event did not happen.

Event #4

Getting sick after eating spoiled peach yogurt before the age of 10.

Your rating: _____ (M, B, or P)

How confident are you in this selection? ____ (1-10, 1= not confident; 10=extremely confident)

If "M", please provide as many details as you can about the event in the space below.

If "B", please provide an explanation of why you believe this event happened in the space below.

If "P", please provide an explanation of why you know this event did not happen.

Event #5

Breaking a window with your hand before the age of 10.

Your rating: _____ (M, B, or P)

How confident are you in this selection? ____ (1-10, 1= not confident; 10=extremely confident)

If "M", please provide as many details as you can about the event in the space below.

If "B", please provide an explanation of why you believe this event happened in the space below.

If "P", please provide an explanation of why you know this event did not happen.

Appendix L - Food History Inventory

Below is a list of events that may or may not have happened to you before you were 10 years old. Please read each event and rate on an 8-point scale how certain you are that the event (or a very similar event) did or did not happen to you by circling one of the numbers to the right of the item. Circle the "1" only if you are *completely confident* that the event **did not** happen to you before you were 10 years old. Circle the "8" if you are *completely confident* that the event **did** happen to you before you were 10 years old. And, if you are not completely confident, choose one of the middle numbers.

		Definitely did not happen						Definitely happened	
		1	2	3	4	5	6	7	8
1	Ate two scoops of ice cream on a cone	1	2	3	4	5	6	7	8
2	Sold chocolate bars for a school fundraiser	1	2	3	4	5	6	7	8
3	Broke a pinata at a birthday party	1	2	3	4	5	6	7	8
4	Felt uncomfortably full after eating Thanksgiving dinner	1	2	3	4	5	6	7	8
5	Ate too much ice cream	1	2	3	4	5	6	7	8
6	Helped someone peel potatoes	1	2	3	4	5	6	7	8
7	Baked a birthday cake	1	2	3	4	5	6	7	8
8	Ate dinner at a very fancy restaurant	1	2	3	4	5	6	7	8
9	Felt ill after eating a dill pickle	1	2	3	4	5	6	7	8
10	Spilled a bowl of punch at a wedding	1	2	3	4	5	6	7	8
11	Slipped on a banana peel and fell down	1	2	3	4	5	6	7	8
12	Made kool-aid by yourself	1	2	3	4	5	6	7	8
13	Bought a school lunch	1	2	3	4	5	6	7	8
14	Ate a hotdog with onions and sauerkraut	1	2	3	4	5	6	7	8
15	Ate a candy apple at a local fair	1	2	3	4	5	6	7	8
16	Got sick after eating spoiled dairy	1	2	3	4	5	6	7	8
17	Had a cheese pizza delivered	1	2	3	4	5	6	7	8
18	Ate freshly picked vegetables	1	2	3	4	5	6	7	8
19	Baked a pie with your mother	1	2	3	4	5	6	7	8
20	Were forced to go on a diet	1	2	3	4	5	6	7	8
21	Ate a caramel apple at a fair	1	2	3	4	5	6	7	8
22	Felt sick after eating airline food	1	2	3	4	5	6	7	8
23	Had a corn dog at a baseball game	1	2	3	4	5	6	7	8
24	Ate breakfast in bed with your parents	1	2	3	4	5	6	7	8

Appendix M – Phobia Questionnaire

Below are listed a series of frequently reported fears and phobias. Please read each item and rate on an 8-point scale how nervous or uncomfortable each currently makes you feel.

	Not at all nervous or uncomfortable			Moderately nervous or uncomfortable			Very nervous or uncomfortable	
	1	2	3	4	5	6	7	8
1 Snakes	1	2	3	4	5	6	7	8
2 Crowds of people	1	2	3	4	5	6	7	8
3 Fire	1	2	3	4	5	6	7	8
4 Flying in an airplane	1	2	3	4	5	6	7	8
5 Mice	1	2	3	4	5	6	7	8
6 Close spaces (claustrophobia)	1	2	3	4	5	6	7	8
7 Spiders	1	2	3	4	5	6	7	8
8 Drowning	1	2	3	4	5	6	7	8
9 Heights	1	2	3	4	5	6	7	8
10 Dirt	1	2	3	4	5	6	7	8
11 Food poisoning	1	2	3	4	5	6	7	8
12 Speaking in public	1	2	3	4	5	6	7	8
13 Vomit	1	2	3	4	5	6	7	8
14 Strangers	1	2	3	4	5	6	7	8
15 Seeing a ghost	1	2	3	4	5	6	7	8
16 Blood	1	2	3	4	5	6	7	8
17 Pain	1	2	3	4	5	6	7	8
18 Being arrested	1	2	3	4	5	6	7	8
19 Dogs	1	2	3	4	5	6	7	8
20 Thunderstorms	1	2	3	4	5	6	7	8
21 Germs	1	2	3	4	5	6	7	8
22 Darkness	1	2	3	4	5	6	7	8
23 Receiving an injection	1	2	3	4	5	6	7	8
24 Dentists	1	2	3	4	5	6	7	8
25 Serious illness	1	2	3	4	5	6	7	8
26 Clowns	1	2	3	4	5	6	7	8
27 Bats	1	2	3	4	5	6	7	8
28 Plants	1	2	3	4	5	6	7	8
29 Ants	1	2	3	4	5	6	7	8
30 Crossing bridges	1	2	3	4	5	6	7	8
31 Aliens	1	2	3	4	5	6	7	8
32 Rats	1	2	3	4	5	6	7	8
33 Loneliness	1	2	3	4	5	6	7	8
34 Lightning	1	2	3	4	5	6	7	8
35 Worms	1	2	3	4	5	6	7	8
36 Loud noises	1	2	3	4	5	6	7	8

Appendix N – Informed Debriefing and Consent to Include Data Form



Post-Study Debriefing and Consent

Title of Study: **Consequences of False Suggestion**

You have just participated in a study conducted by Alex Wilson, Dr. Alan Scoboria, and Dr. Josee Jarry from the Psychology department at the University of Windsor.

The study in which you just participated is part of an investigation on the consequences of suggesting false childhood events. The goal of this study is to identify how changes in attitudes related to the suggestion affect preferences for the target food (peach yogourt) and intentions to eat this food. The attitudes that we are investigating include beliefs about the healthy properties of the food, beliefs that the food is dangerous, and beliefs that the food is disgusting.

The study included two parts: 1) an online survey and 2) experimental session. When you arrived at the lab, we gave you a profile report based on your response to the online survey. This information was false. The report was fabricated to convince some participants that they experienced an event that never happened (having been sick due to spoiled peach yogourt as a child). Our interest is to see if some people come to believe that this event did in fact occur. If you received information indicating as a child you became sick after eating peach yogourt, you need to understand that this information is false. Even if you believe that the event did happen or you have a memory for the event, this very likely did not occur. If you did come to believe this event, you are not alone: in prior studies between 40% and 60% of undergraduate students have come to believe that this event occurred to them as children.

Thank you for your participation in this study. Whether you consent to releasing your data or not, you will receive 1 bonus point for 60 minutes of participation towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses.

All of the other information provided on the consent form (regarding confidentiality of participation, rights of withdrawal, and consent) are accurate and remain in force.

Now that you are fully informed about the purpose for the study, we ask your permission to include your data in the study. If you agree, please sign below.

I agree for my data to be included in this study.

Signature of participant

Appendix O – Supplementary Tables

Table A

Means and standard deviations for DV change scores due to suggestion

Variable	Suggestion group (n=71)		Control group (n=28)	
	Mean	SD	Mean	SD
Peach yogourt preference	-.381	1.511	.261	1.066
Intention to eat fruit yogourt	-.720	1.897	-.245	.994
Intention to eat sliced peaches	-.656	1.923	-.193	1.150
Intention to eat peach yogourt (Aggregate)	-.710	1.644	-.164	.851
Autobiographical belief	1.937	2.632	.017	1.484
Autobiographical memory	2.241	2.599	-.003	.609
Disgust	.713	1.422	-.034	.540
Health belief	-.678	1.168	-.117	.681
Danger	.462	1.205	.043	.536

Note: All means are adjusted for baseline scores. Adjusted means were calculated for the experimental group versus control group contrast and therefore differ in the amount of adjustment compared to the believer status contrast. Means and standard deviations for disgust and danger were calculated using untransformed factor change scores and were adjusted using the untransformed baseline scores.

Table B

Means and standard deviations for DV scores due to believer status

Variable	Believers (n=34)		Non-Believers (n=37)		Control Group (n=28)	
	Mean	SD	Mean	SD	Mean	SD
Peach yogourt preference	-.305	1.671	-.451	1.365	0.216	1.066
Intention to eat fruit yogourt	-.661	1.728	-.773	2.053	-.247	.994
Intention to eat sliced peaches	-.426	2.043	-.866	1.798	-.195	1.150
Intention to eat peach yogourt (Aggregate)	-.598	1.606	-.809	1.675	-.168	.851
Autobiographical belief	3.789	1.935	.229	1.858	.025	1.484
Autobiographical memory	4.014	2.414	.613	1.754	-.005	.609
Disgust	.890	1.540	.551	1.306	-.035	.540
Health belief	-.676	1.286	-.680	1.051	-.117	.681
Danger	.641	1.477	.297	.892	-.044	.536

Note: All means are adjusted for baseline scores. Adjusted means were calculated for the believer status contrast and therefore differ in the amount of adjustment compared to the experimental contrast. Means and standard deviations for disgust and danger were calculated using untransformed factor change scores and were adjusted using the untransformed factor baseline scores.

VITA AUCTORIS

Alexander Maurice Wilson was born in 1975 in Quesnel, British Columbia. In 1993, he completed high school at Killarney Secondary School in British Columbia. He attended Kwantlen Polytechnic University where he obtained a Bachelor of Applied Arts Honours degree in Psychology in 2010. Inspired by his undergraduate mentor Daniel M. Bernstein, he moved to Windsor to pursue a graduate degree in Applied Social Psychology. He completed the Master of Arts degree at the University of Windsor in 2012.