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USING ACTION TENDENCY EMOTIONS AS PERSUASIVE TOOLS FOR MOTHERS TO ENCOURAGE A HEALTHY DIET FOR THEIR PREADOLESCENT DAUGHTERS IN A THEORY OF PLANNED BEHAVIOR FRAMEWORK

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ABSTRACT

USING ACTION TENDENCY EMOTIONS AS PERSUASIVE TOOLS FOR MOTHERS TO ENCOURAGE A HEALTHY DIET FOR THEIR PREADOLESCENT DAUGHTERS IN A THEORY OF PLANNED BEHAVIOR FRAMEWORK

By

Lauren M. Hamel

The childhood obesity and overweight problem in the United States has reached an all time high. About one in every five American children is overweight. Overweight children are more likely to be overweight adults and are more likely to incur a variety of very serious weight related conditions later in life such as certain cancers, type 2 diabetes, and cardiovascular problems. Moreover, overweight girls are more likely to incur breast cancer as adults than are normal weight girls. Prior research has shown that the diet of preadolescent girls is highly influenced by their mothers. The current research effort targeted mothers (N = 132 in the first stage and N = 32 in the second stage) with preadolescent daughters aged 6 to 11 in an effort to persuade them to encourage a healthy diet for their daughters. The theory of planned behavior was utilized as a framework and the action tendency emotions of anger, sadness, and guilt were explored through an experimental design to determine what sources are likely to elicit these emotions and whether these emotions are significant predictors of mothers' intent and actual encouragement of a healthy diet in their preadolescent daughters.

Results indicate that the TPB components of attitude and perceived behavior control are the best predictors of mothers' behavioral intent to encourage a healthy diet in their preadolescent daughters, and although none of the emotions were found to be

significant predictors of intent or actual behavior, a negative emotional response mechanism was found to be the only predictor of actual encouraging behavior. In addition, a magic cell was found in which a message of concern regarding the reduced likelihood of one's daughter becoming overweight/obese if a mother encourages her daughter to eat healthily from another mother was most likely to result in participant return to report encouraging behaviors. Unanticipated findings of a topic effect as well as future research and practical applications are discussed.

DEDICATION

I would like to dedicate this dissertation to my wonderful, loving family, my mother, my father, my sister Amanda, and my husband, Jonathan. They have always encouraged me to go after my dreams and to stay strong in the face of adversity. Their undying love and support were my foundation during this experience.

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Using Action Tendency Emotions as Persuasive Tools for Mothers to Encourage a Healthy Diet for their Preadolescent Daughters in a Theory of Planned Behavior Framework

There are more overweight and obese children in the United States than ever before and this increase shows no sign of abating. The Centers for Disease Control and Prevention (CDC) reported that overall prevalence of overweight children between the ages of 6 and 11 has increased from 6.5 percent in 1980 to 18.8 percent in 2004 (National Center for Health Statistics, 2006). Less than 40% of U.S. children and adolescents meet the nation's dietary saturated fat guidelines (U.S. Dept. of Agriculture, 1998). An overall unhealthy lifestyle, which can lead to children being overweight, will negatively affect their health during childhood and those negative effects can carry over into adulthood. Overweight and obese children are more likely to grow into overweight and obese adults, and be affected by future health problems such as colon and breast cancers and type 2, diabetes than are normal weight children (CDC, 2009). In addition, the federal government has identified childhood overweight and obesity as a problem of priority in its Health People 2010 initiative (U.S. Dept. of Health and Human Services, 2000).

The main factor that influences childhood weight problems is the diet of the child. A child who consumes high fat and high calorie foods is more likely than a child who does not consume as much fat or high caloric foods to become an overweight adult and, subsequently, incur a large number of negative health and social outcomes (CDC, 2009; Committee on Prevention of Obesity in Children and Youth, 2005; Guo, Chumlea, Roche, Gardner, & Siervogel, 1994).

One particular condition influenced by childhood weight status is breast cancer. Young girls who are overweight tend to have early onset menarche compared to normal and under weight girls (Adair & Gordon-Larson, 2001). Girls who have their first period earlier than normal (less than 12 years of age) are at a greater risk for incurring breast cancer as adults than girls who have their first period later in adolescence (Brinton, Schairer, Hoover, & Fraumeni, 1988). Thus, it is imperative to work to reduce the prevalence of young females who are overweight and obese as a preventative measure against breast cancer, among other serious conditions.

Research has shown that female children between the ages of 6 and 11 are strongly influenced by their mothers' eating habits and their mothers' attempts to control their daughters' eating habits (Cutting, Fisher, Grimm-Thomas, & Birch, 2007; Hill, Weaver, & Bundell, 1990). Understanding the mother-daughter relationship is a critical step to help reduce the childhood weight problem in the United States . This research will focus on that relationship by extending previous formative research that used the theory of planned behavior (TPB) (Ajzen, 1985; 1991) in combination with action tendency emotions (Lazarus, 1991; Nabi, 2002) in an effort to create persuasive messages for mothers who have daughters between the ages of 6 and 11 (Hamel, 2009a; Hamel, 2009b; Hamel & Smith, 2008). Future messages based on this line of research will be designed to persuade mothers to send messages to their daughters that encourage them to eat healthy foods (fruits, vegetables, non-fat dairy products, etc.) which are low in fat and calories and to avoid unhealthy foods (soda, potato chips, cookies, candy, etc.) which are high in fat and calories. The TPB is useful for this problem because it focuses on the target population's attitude toward a particular behavior, in this case mothers encouraging

their daughters' healthy eating; whether they perceive important others' expect that they should encourage daughters' healthy eating; and the perceived barriers they feel exist that prevent them from encouraging their daughters to eat a healthy diet (Hamel, 2009a; 2009b).

The TPB is a well established theory of behavior that has been used to determine the influences on a variety of health related topics such as organ donation (Bresnahan, et al, 2007), smoking cessation (Babrow, Black, & Tiffany, 1990), condom use (Godin, Fortin, Michaud, Bradet, & Kok) and exercise (Courneya, 1995), among others. The TPB provides a strong framework in which to study constructs that are less researched and less developed in this context. In addition to the components of the TPB, the emotions of anger, sadness, and guilt will be explored as possible antecedents to behavior. Anger, sadness, and guilt have been shown to function as action-inducing emotions in this context, and preliminary data suggests that particular sources will most likely elicit these three specific emotions (Hamel, 2009a). This study is the next step in this program of research which will determine what sources are most likely to elicit anger, sadness, and guilt in mothers and whether these emotions will lead them to intend, and subsequently encourage, a healthy diet in their preadolescent daughters (Hamel, 2009a; 2009b; Hamel & Smith, 2008).

A summary of the current childhood obesity epidemic in the United States and the rationale for targeting mothers of young girls between the ages of 6 and 11 is presented below. Also a summary of the previous applications of the TPB and action tendency emotions in this context will be given and hypotheses and research questions are offered. A description of the proposed methodology, data analysis, and discussion are presented.

Literature review

Prevalence and Repercussions of Childhood Obesity

Currently, there are more overweight and obese children in the United States than ever before and this increase shows no signs of abating (Jollife, 2004; Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Seventeen percent, or about one out of every five children, between 6 and 11 years old is considered overweight (National Center for Health Statistics, 2006). The immediate and long-term health effects of being overweight are significant. Among the most well known effects are the increased risk of certain types of cancers, such as colon and breast cancers, an increased risk for type 2 diabetes, cardiovascular disease, high blood pressure and high cholesterol levels (CDC, 2009; Committee on Prevention of Obesity in Children and Youth, 2005; Guo, Chumlea, Roche, Gardner, & Siervogel, 1994). In addition, overweight children are more likely to be overweight adults and consequently endure the health concerns related to being overweight. Moreover, overweight female preadolescents are more likely than their male counterparts to be overweight in adulthood (Guo, et al. 2000).

Research has determined that it is the higher number of fat cells in these young girls that expedites puberty and then puts them at higher risk for breast cancer (Stoll, 1998). A study sponsored by the American Cancer Society (Jemal, et al. 2006) found that in the United States 212,920 new cases of breast cancer are diagnosed each year in women. In men, however, only 1,720 new cases are found each year. Given that overweight girls are more likely than boys to grow into overweight adults, and they face increased risk for breast cancer, this research will focus on girls. The most successful point of intervention for weight problems is during childhood when the problem is still

developing (Guo et al., 2000), thus this research will target mothers with preadolescent daughters.

Maternal Effects on Food Consumption

The relationship between preadolescent daughters and their mothers is the focus of this research because it has been shown that girls in this age group are strongly influenced by their mothers. Preadolescent girls are influenced by their mothers' eating habits and by the ways their mothers attempt to restrict their daughters' food consumption (Cutting et al., 2007; Hill et al., 1990). Mothers will often restrict food to their daughters if they feel they are too heavy. Unfortunately this restriction can result in further weight gain in daughters because they will start eating in the absence of hunger when food is available because it is so often restricted to them (Fisher & Birch, 2002). In addition to mothers' ability to model dietary behaviors (Birch & Fisher, 2000) as well as restrict their daughters' food intake, it is often the case that mothers are the family member most likely to determine what food is brought into the home and what food is consumed outside of the home (Birch & Fisher, 2000). It is mothers' influence as models, restrictors and food regulators that provide support to the importance of the mother figure in this context.

Previous research has found that parental communication can influence the diets of preadolescent daughters. Perceptions of parental support have been found to decrease concern about body image and act as a protector from disordered eating or feelings of need to diet (Sinton & Birch, 2006). Parental support has also been shown to influence adolescent diabetes management such that supportive parenting resulted in improved diabetes management in diabetic adolescents (Hanson, De Guire, Schinkel, & Kolterman,

1995). In general, past research has demonstrated that support from parents conveys to children that certain behaviors are desirable and that can influence children's health-related behaviors (Boone & Lefkowitz, 2007).

In addition to supportive communication, parents' attempts at persuasion are also found to significantly predict their children's eating habits. Bourcier, Bowen, Meischke, and Moinpour (2003) surveyed 870 families to determine what strategies parents used to influence their children's eating habits. They concluded that persuasive attempts that centered around how diet influences physical and mental performance significantly influenced children's fat consumption, and persuasive arguments centered around how diet influences feeling and looking good significantly influenced fruit and vegetable intake. It has also been shown that children with healthier diets and weights are more likely to have parents who use positive persuasion efforts to influence healthy eating (Hendy, Williams, Camise, Eckman, & Hedemann, 2009). To this point research regarding the influence of communication on childhood nutrition has examined both parents collectively. The current research will add to the existing literature by specifically investigating communication between mothers and preadolescent girls.

The current research effort is the next step in a program of research necessary to craft effective persuasive messages (Hamel, 2009a; 2009b; Hamel & Smith, 2008) to persuade mothers to encourage their preadolescent daughters to eat healthily. Prior research endeavors included a focus group study (N = 4 groups) with mothers who had at least one daughter between 6 and 11 years of age. Each group was led through a discussion to assess participants' on the components of the TPB, types of messages they

thought would lead to particular emotions, and if those emotions would lead to any particular behaviors. The specific topics of conversation can be found in Table 1.

Table 1

Focus Group Topics of Discussion from Hamel & Smith, 2008

1. attitude toward encouraging their daughters to eat healthy diets
2. the people that they perceived to be important others, and whether these people thought the mothers should or should not encourage their daughters to eat healthily
3. the perceived barriers the mothers deal with when encouraging their daughters to eat healthily
4. the outcomes they perceive are likely from encouraging their daughter to eat well
5. what types of messages and what sources of messages would cause them to experience a variety of action tendency emotions
6. what responses, if any, they would have to those emotions

These data were then used to inform the second research endeavor which was a web-based survey that was completed by women from the same population (N = 104), women who were mothers with at least one preadolescent daughter (Hamel, 2009a; 2009b). This survey was conducted in order to determine whether the data obtained from the focus groups generalized to a larger population.

The web-survey participants were assessed on their attitude toward encouraging their daughters to eat healthy diets, who their important normative referents were

concerning whether to encourage their daughters to eat healthily, and which perceived barriers they dealt with when encouraging their daughters to eat healthily and how powerful they perceived those barriers to be. They also indicated what outcomes were likely from encouraging their daughters to eat well and provided evaluations for those outcomes. Finally, they were assessed on their behavioral intention to encourage their daughter to eat a healthy diet. Attitude, subjective norm, and their perceived behavioral control were all positive predictors of their behavioral intention prior to the inclusion of the effect of action tendency emotions.

Survey participants were also asked to respond to how likely they felt they would be to experience seven action tendency emotions. Four different sources were provided (based on the focus group data); their own mother, mother in law, mother of a child their daughter went to school with, and their daughter's pediatrician. Participants were then asked how likely they would be to experience each emotion if they heard a message of praise or of concern from each of these sources. All of the combinations of type of messages and possible emotions were submitted to a hierarchical linear regression. Anger and sadness from messages of concern were positive significant predictors of behavioral intent to encourage their daughters to eat healthily, and guilt was significantly, but negatively, related to behavioral intention. After the inclusion of these action tendency emotions into a subsequent step of the regression discussed above, only attitude from the TPB was significant predictor of the intention to encourage their daughters to eat healthily along with the action tendency emotions of anger, sadness, and guilt.

The current research is the next step toward creating messages that will attempt to persuade mothers that they should encourage their daughters to make healthy food

choices. To reach this goal, the current research will incorporate the TPB as a conceptual framework and action tendency emotions elicited from particular sources of messages to act as possible persuasive variables for this population. The conceptualization and further discussion of previous research on the use of the TPB and action tendency emotions in this context is provided in the following section.

Theory of Planned Behavior

The TPB (Ajzen, 1985; 1991) serves as a framework and a guide for the current research. Succinctly put, the TPB is concerned with predicting behavioral intention and subsequent behaviors by assessing attitude, subjective norm, and perceived control of the behavior in question (see Figure 1).

Attitude. The attitude one holds toward a certain behavior is a function of an individual's behavioral beliefs about the potential outcomes of performing the behavior and the evaluation of those outcomes. Whether one holds a positive or negative attitude toward a behavior is based on how likely they believe certain outcomes of the behavior are to occur and if they perceive those outcomes as a positive or a negative.

Research on attitude. Previous research indicated that mothers of preadolescent daughters agree or strongly agree that encouraging a healthy diet in their daughters prior to adolescence is likely to improve their daughters' health in the present, reduce their chances of becoming overweight or obese, help them to choose healthy foods, and to prevent serious disease in their futures. All of these outcomes were perceived to be desirable (Hamel, 2009a; 2009b). This research demonstrated that mothers' attitude toward encouraging a healthy diet in their preadolescent daughters was a significant predictor of their intent to encourage them.

Subjective norm. A subjective norm is a function of one's normative beliefs. Normative beliefs are the perceptions an individual holds of whether important referent others in his or her life believe that he or she should engage in the behavior of interest (Ajzen, 1985; 1991; Park & Smith, 2007). These referent perceptions are determined by assessing whether one perceives important others think that they should perform the behavior, and whether the referent actually engages in the behavior them self. In addition to identifying these important people, the extent at which an individual feels motivated to comply with these referents must be understood. This is the degree to which the individual is likely to follow what he or she perceives the important referents think they should do and/or do themselves.

This group of people can include spouses, family members, friends, bosses, or coworkers. This perception of what behaviors others want them to perform results in a perceived social pressure to act in accordance with those others. The subjective norm component of the TPB is comprised of the likelihood that these important referents believe that one should perform the behavior in question. For example, if an individual perceives the important referents in her life, with whom she wants to comply, want her to engage in a particular behavior then the individual will also view the behavior positively. The inverse of this is that an individual will view a behavior negatively if she perceives that the important referents in her life with whom she wants to comply do not think that he or she should enact the behavior.

Research on subjective norm. Previous research on this population assessed the most valued referent and also the most likely referent, to determine if there is a difference between normative referents whose opinions are valued and those who are merely more

likely to communicate their perceptions about encouraging a healthy diet in one's preadolescent daughter. There was indeed a difference. The most valued referent was the daughter's father, but the most likely referent was a woman's own mother. Further, the most likely referent had more influence over intent to encourage than the most valued referent (Hamel, 2009a; 2009b). The current research effort will further explore this finding to determine if the most likely referent significantly predicts actual behavior rather than just intent. However, the traditional conceptualization of subjective norm (an aggregate of important others) will also be assessed.

Perceived behavioral control. Perceived behavioral control (PBC) is determined by the individual's perceived barrier(s) to performing the behavior in question. In addition, control beliefs determine how likely the barrier(s) will be able to deter individuals from performing the behavior. Control beliefs refer to the magnitude of any particular barrier, and how likely that barrier will be to prevent the individual from performing the behavior. These perceived barrier beliefs can be the result of individual past experiences and often are influenced by second hand information from others. These resources and obstacles can be internal to the person or external. Perceived resources and obstacles will work in tandem to create the overall perception of behavior control. For example, an individual will have higher PBC if resources for performing the behavior are many and obstacles are few. PBC, however, will be moderate if resources and obstacles are substantial or if resources and obstacles are few. Of course, PBC is lowest when resources are few and obstacles are many.

Research on perceived behavioral control. Previous research on this population indicated that the most common perceived barrier to encouraging a healthy diet was

daughters' taste for healthy foods (Hamel, 2009a; 2009b). Although this may not inhibit encouragement directly, mothers may feel their encouragement will be in vain if their daughters' tastes are less accepting of healthy foods. In addition, PBC was a significant negative predictor of intent to encourage healthy eating in the first step of the regression although it dropped out later. It could be the case that this particular group of mothers did not perceive any barriers to act as true behavioral inhibitors. Something to note about this research is that the samples used in the focus group study and the web survey study were relatively affluent (based on level of education) and that may have influenced the perceptions of certain barriers. For example, in less wealthy areas prices or availability of healthy foods act as greater barriers compared to tastes for foods (Eikenberry & Smith, 2004).

Intention and behavior. The behavioral intention component of the model concerns the likelihood that the individual will perform the behavior in question. Intention is determined after taking all of the previously discussed components into consideration. In other words, an individual's attitude, subjective norm, and perceived behavioral control should result in one's intention to engage in a particular behavior. Intention should then predict whether or not an individual will actually engage in the behavior.

Given what has been found previously, the following predictions concerning the TPB components are posited:

H1: Mothers' attitude toward encouraging a healthy diet in their preadolescent daughter(s) will be a significant positive predictor of their behavioral intent and actual encouragement of a healthy diet in their preadolescent daughter(s).

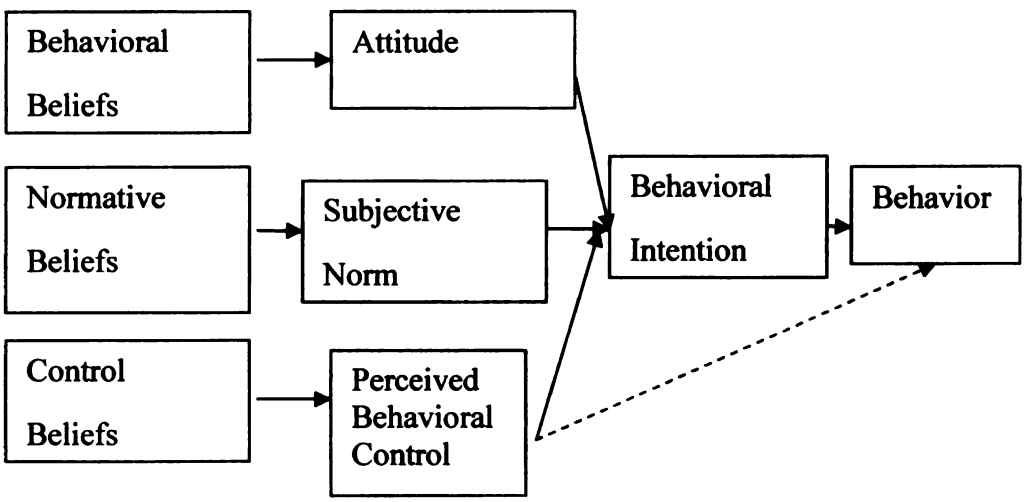
H2: Mothers' subjective norm (the person most likely to talk to them about encouraging their daughters to eat healthy diets) will be a significant positive predictor of their behavioral intent and actual encouragement of a healthy diet in their preadolescent daughter(s).

H3: Mothers' perceived behavioral control over their most major barrier will be a significant positive predictor of their behavioral intent and actual encouragement of a healthy diet in their preadolescent daughter(s).

H4: Mothers' behavioral intent will be a significant positive predictor of their actual encouragement of a healthy diet in their preadolescent daughter(s).

Figure 1

Model of the Theory of Planned Behavior (adapted from www.people.umass.edu/aizen)



Source

As previously discussed, prior research has begun to determine which sources are more likely to elicit particular emotions (Hamel, 2009a; Hamel & Smith, 2008). The previously mentioned focus group study probed participants about which sources were most likely to elicit each of the relevant emotions when delivering messages of concern

to mothers of preadolescent daughters that they needed to encourage healthy eating in the daughters. The subsequent web survey study then yielded some preliminary quantitative data regarding source elicitation of each emotion. Analyses indicated that one's own mother was most likely to elicit guilt in this context, whereas anger was equally likely to come as a result of a message from a mother- in-law or another mother, such as the mother of a child her daughter goes to school with. Overall, the likelihood of the elicitation of sadness was low, although all three previously mentioned sources were equally likely to evoke sadness. This capability of messages with different sources to produce multiple emotions both within and between respondents is typical in emotion research. Dillard and Meiinders (2002) explicitly state that messages often result in more than just the targeted emotion due to the subjective appraisal of persuasive messages. All of these emotions, regardless of source, were anticipated to come from messages of concern. The current research will test whether these sources do elicit the predicted emotions and whether a mother, mother-in-law, or other mother source is the most likely to result in each emotion.

To further investigate the influence of sources on invoked emotions and subsequent behavior, the perceived credibility of each source will be evaluated. Credibility has to do with the believability of the source (O'Keefe, 2002) and it has been determined to have three independent dimensions; competence, trustworthiness, and caring (McCroskey & Teven, 1999). Competence is defined as a source's level of expertise of qualification in a particular area. Trustworthiness is defined as the integrity or character of the source. Caring is has to do with if the source is perceived to have

someone's interest at heart or are concerned with their well-being. These dimensions will be assessed to determine if the sources differ on any of the three levels.

In a meta-analysis of the influence of source credibility on attitude and behavior (Klein, 2007), found only one study which directly tested the influence of source credibility on behavior (Tybout, 1978). Although Tybout (1978) determined that there was a moderate relationship between source credibility and behavior, the majority of studies in this review examined source credibility's influence on attitude change and did not extend to the examination of behavior. This meta-analysis is evidence of the lack of understanding of the influence of source credibility on actual behavior. Source credibility in this context may involve a variety of factors possibly including mothers' perceptions of the sources' healthy lifestyle, or whether or not they have provided helpful advice or information in the past regarding healthy choices for themselves or their daughters.

Taken together, the increased knowledge of the ability of different sources to evoke emotions, and the increased understanding of their perceived levels of credibility, will not only play a major role in future persuasive message design in this specific context, but also add to the literature of action tendency emotions and the influence of source credibility on behavior.

Given what has been found about this populations' anticipation of experiencing particular emotions from particular sources, and the inclusion of the dimensions of credibility as a means to understand the relationship farther, the following predictions and questions concerning source are posited:

H5: Messages of concern from mothers-in-law and other mothers will invoke anger more so than messages of concern from own mothers.

H6: Messages of concern from own mothers will invoke guilt more so than messages of concern from mothers-in-law and other mothers.

RQ1: Will messages of concern from own mothers, mothers in law, and other mothers differ in their ability to invoke sadness?

RQ2: Will sources differ in their perceived credibility in terms of competence, trustworthiness, and caring?

Action Tendency Emotions

In an effort to include emotional variables in a theory that assumes rational decision making on the part of the actors (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2003), to increase the persuasiveness of the messages created from this research, and to further understand the effects of action tendency emotions on mothers of preadolescent daughters, the emotions of anger, sadness, and guilt will continue to be explored. The previous steps to the current effort assessed how this population perceived the likelihood of a) experiencing certain emotions based on different types and sources of messages and b) what their responses would be to those messages (Hamel, 2009a; Hamel & Smith, 2008). What follows is a summary of the previous research on these emotions, which three emotions will be the focus of this research, and predictions of how these emotions will affect outcomes in this context.

Emotions are generally defined as internal mental states that result from an evaluation of people, events, or objects (Ortony, Clore, & Collins, 1988). Action tendency refers to the capability of discrete emotions to motivate some type of behavioral response in those who experience particular emotions (Izard & Ackerman, 2000; Lazarus,

1991). The current research is designed to bring further attention to the study of emotion and communication, especially in terms of using emotions to influence behavior.

Emotions are generally divided into two separate groups, goal incongruent emotions (negative emotions) and goal congruent emotions (positive emotions) (Lazarus, 1991; Nabi, 2002). Previous research examined the negative emotions of anger, guilt, sadness, and fear and the positive emotions of happiness/joy, compassion, and pride to determine if any of these would be fruitful avenues to influence or persuade mothers to encourage a healthy diet for their daughters (Hamel, 2009a; Hamel & Smith, 2008). All of these emotions had previously been shown to have varying types of action tendencies associated with them (Lazarus, 1991) although not specifically in this context of persuading mothers to encourage their preadolescent daughters to eat healthily. Hamel (2009a) concluded that the negative emotions of anger, sadness, and guilt all had significant influence on mothers' intent to encourage a healthy diet in their preadolescent daughters. Although, anger and sadness were found to be positive predictors of intent, guilt was a negative predictor. These findings are typical of research that studies the influence of emotions on attitude and behavioral change. Specifically, when compared to positive emotions, negative emotions (such as anger, sadness and guilt) are more likely to result in increased cognitive processing and subsequent attitude and/or behavior change (Lazarus, 1991). It is theorized that when compared to the experience of positive emotions, the experience of negative emotions increases cognitive processing (Dillard & Meijnders, 2002) and that negative emotions result in more focused processing (Nabi, 1999). This research follows up on these findings in order to investigate these emotions

more thoroughly to determine how they act as influencers of particular actions by examining their action tendencies.

Anger is viewed as the reaction to a demeaning offense against oneself or someone close to the individual (Lazarus, 1991). The action tendency associated with anger is problem solving behavior that is intended to neutralize the existing obstacle which is causing the anger (Nabi, 2002) or attacking the source of the offense (Dillard & Peck, 2001). Lazarus (1991) defined anger as a goal incongruent emotion, and it is predicted that these incongruent feelings motivate the desire to return to a state of congruency. For example, in the current context, if a mother was to hear from someone, such as her mother in law or another mother, that they were concerned that she had not spoken to her daughter about her diet and that her preadolescent daughter's poor diet could be an obstacle to her current and future health, she might feel angry. The anger she may experience from that message from that source should motivate her to encourage her daughter to eat better in an effort to remove the obstacle of a poor diet in an effort to bring her actions in line with her goals (of a healthy daughter).

Although not necessarily specific to anger, the Negative State Relief Model (NSR; Cialdini, Darby, & Vincent, 1973) is based on this type of prediction. When an individual experiences a negative feeling or emotion, he or she is intrinsically driven to assuage those negative feelings through some type of behavior. Somewhat similar to the NSR model, the Anger Activism Model (AAM; Turner, 2007) makes specific predictions about the emotion of anger as a motivator to action. The AAM predicts that anger will result in higher behavioral intent and actual behavior as long as one perceives the capability to bring about the change necessary to reduce anger. This prediction regarding

anger is related to the component of PBC in the TPB. If one is to have behavioral intent and enact actual behavior, one must perceive the capability of performing the behavior. That is to say, if one perceives an insurmountable barrier, regardless of the level of anger, intent and actual behavior become less likely.

Previous research in this context suggests that anger will function similarly to what is predicted in the NSR and the AAM (Turner, Bessarabove, Sipek, & Hambleton, under review). The current research will further assess the association between anger and problem solving behaviors as a means to persuade mothers to encourage their preadolescent daughters to eat a healthy diet.

H7: Anger evoked by concern messages will be a significant positive predictor of behavioral intention and actual encouragement of a healthy diet by mothers to their preadolescent daughter(s).

Sadness is the reaction one feels when a loss has been endured. Although this emotion has been shown to slow cognitive functioning and possibly result in withdrawal (Lazarus, 1991) it also has been shown to increase individual inward evaluation and processing (Mitchell, 2000) that then leads to problem solving activity in an attempt to recover the loss (Dillard & Peck, 2001; Nabi, 1999). Although sadness is considered discrete from other negative emotions such as anger (Lazarus, 1991; Mitchell, Brown, Morris-Villagran, & Villgran, 2001), its ability to produce behaviors can also be explained by the NSR. Just as anger is goal-incongruent, so is sadness. The noxious state one experiences while feeling sad is the motivation to try to reduce the sadness. Compared to anger and guilt, sadness is an understudied emotion (Barr-Zisowitz, 2000). However, Yoo and Tian (under review) explored the use of sadness as a motivator of

behavior by comparing a sadness inducing message about organ donation to a control message. They concluded that the sadness one feels after exposure to a sadness-inducing persuasive message was more likely to result in empathic responses than the control message.

Given that the current research is also focused on a prosocial act (encouraging a healthy diet in one's daughter) similar to Yoo and Tian (under review), and the previous evidence that sadness is a positive predictor of intent to encourage a healthy diet in one's preadolescent daughter, it is predicted that sadness will function as a motivator to action in this context.

H8: Sadness evoked by concern messages will be a significant positive predictor of behavioral intention and actual encouragement of a healthy diet by mothers to their preadolescent daughter(s).

Guilt is conceived as the reaction when one has transgressed in some fashion or feels previous actions are inconsistent with perceptions of proper conduct (O'Keefe, 2002). The related action tendency is to atone or make reparation for the harm the individual has committed in order to return to a balanced standard (Dillard & Peck, 2001; Lazarus, 1991). Similar to anger and sadness, guilt is a negative, goal-incongruent emotion (Lazarus, 1991) that has been shown to result in behaviors to repair the feelings of guilt (Massi, Yum, & Hill, 2007) similar to what is predicted in the NSR. Contrasted from the previous discussed negative emotions, however, the high arousal of guilt tends to result in reactive responses (O'Keefe, 2002). Reactance responses are those in which an individual perceives a threat to a freedom and will not acquiesce to the requested action as a means to reestablish personal freedom (Brehm & Brehm, 1981). Although

Hamel (2009a) did not measure reactance explicitly, guilt was found to be a significant and negative predictor of behavioral intent which may be preliminary evidence of a reactive response on the part of mothers who experienced the emotion of guilt. Although explicit guilt appeals do arouse more guilt than less explicit appeals, they do not tend to lead to greater persuasion or behavior change (O'Keefe, 2002). Guilt appeals which are too overt or too explicit are also perceived to be irritating or annoying. These extra feelings of irritation and annoyance interfere with any persuasive effects guilt provides.

Given what has been demonstrated by O'Keefe (2002) and the evidence from previous research in this context that guilt is a negative predictor of intent to encourage a healthy diet in one's preadolescent daughter (Hamel, 2009a), it is predicted guilt will act in the same way in the current research. Specifically, guilt inducing messages will be perceived to be irritating and annoying and will result in less intent and actual encouragement.

H9: Guilt evoked by concern messages will be a negative predictor of behavioral intent and actual encouragement of a healthy diet by mothers to their preadolescent daughter(s).

As previously discussed, there is evidence that the emotions of anger and sadness have problem solving tendencies for this population but that guilt will act as an inhibitor of problem solving behaviors (Hamel, 2009a). The current research is expanding this area further to determine if these action tendency emotions function as predicted beyond behavioral intent but also to actual behavior and to provide more evidence about how these emotions function in this context. Information from this experiment will help the future design of messages to persuade mothers of preadolescent daughters to encourage

healthy eating. Although anger and sadness have all shown evidence of problem solving or prosocial behavior, it is unclear which will serve as significant motivators for mothers of daughters between the ages of 6 and 11 to encourage their daughters to eat healthily. In addition, guilt has been shown to act as a negative predictor on intent. If this is the case, messages that evoke guilt should be avoided in future endeavors.

Specific Aims

The specific aim of this research is to gain an increased understanding of the role of the components of the TPB and emotions in encouragement behavior by mothers. Specifically, what sources, through messages of concern regarding a mother's habits of encouraging a healthy diet in her preadolescent daughter, will invoke the emotions of anger, sadness, and guilt? In addition, will those emotions result in encouragement behavior (or lack thereof) based on previous research regarding the predicted action tendencies of each? Findings from this research endeavor can be used to craft future persuasive messages intended to influence mothers to encourage their daughters to eat healthily through the use of proper sources which will increase the likelihood of the emotion(s) experienced and, subsequently, increase the likelihood of the desired behavior, encouraging a healthy diet in one's preadolescent daughter(s).

METHOD

Participants and Procedures

A sample of 132 mothers with at least one daughter between the ages of 6 and 11 was recruited through email invitations and word of mouth from the members of the research center in which this study was conducted. All 132 participants completed the first phase of data collection and 32 (24.2%) participants completed the second stage. All participants who completed both phases of the data collection were entered into a contest for a $100 dollar gift card to a store of her choice, or a $100 donation to a charity of her choice. The age range was between 28 and 58 with a mean of 40.2. The sample's ethnicity was 90.1% Caucasian, 3.8% African, 2.3% Latina, 3.0% Asian, and .8% other. Most participants were married, 90.2%, 3.8% were single, .8% engaged, 4.5% were divorced, and .8% were in a long-term relationship but not married. Almost half of the participants had completed graduate school, 48.5%, 9.1% had completed some graduate school, 29.5% had completed college or post high school training, 9.8% had completed some college or post high school training, and 2.3% had completed from high school. All of the participants had at least one daughter between 6 and 11, 19.7% had a second daughter in that age range, and 3.0% had three daughters between 6 and 11. More than half of the participants had at least one other child (besides the daughter(s) between 6 and 11), 62.1%.

All participants received an email invitation with a link to the web-based survey which assessed all of the independent variables, demographic information and one of the dependent variables, intent to encourage a healthy diet in their preadolescent daughters. At the end of this survey, participants were given a web link to the second survey with a

request to return in one week to complete a two question follow-up survey. Participants were also told that upon their completion of the second survey, they would be provided an email address to which they could write, informing the study's researchers that she completed the second survey and to enter her name in the contest.

Experimental Design

A 2 X 3 between subjects experimental design was employed. Each participant read a message of concern from one of three sources (own mother, mother in law, or mother of her daughter's classmates). One message focused on the reduced likelihood of having an overweight daughter if a mother encouraged her to eat healthily and the second message focused on the improvement of a daughter's general social well-being as a child and an adult if a mother encouraged her to eat healthily.

Measures

Items from previous research (Hamel, 2009a; Hamel, 2009b) were used to assess attitude, subjective norm, and perceived behavioral control. In addition, as previously mentioned, two messages of concern (reduced likelihood of overweight/obesity and increased general social well-being) from the sources of interest (own mother, mother in law, and another mother) were tested in an effort to invoke the three emotions which previous research suggests are related to behavioral intention (anger, sadness, and guilt), and finally, behavioral intent and actual behavior were assessed (See Appendix A).

Attitude toward encouraging a healthy diet in one's preadolescent daughter was assessed by five items that asked participants their perceptions on the likelihood of a variety of possible behavioral beliefs of encouragement (e.g. improved health now and in the future, reduced chance of breast cancer, etc.) and five items that assessed their

outcomes evaluations of those possible outcomes (good or bad). Attitude was then determined by multiplying the aggregate of the behavioral beliefs by the aggregate of the outcome evaluations.

The subjective norm that influences intent and actual encouragement of a healthy diet was determined by asking participants to indicate who serves as their most likely normative referent on this particular issue. This particular normative referent was assessed in addition to the most valued referent because previous research has shown the former to have a greater influence on intent to encourage a healthy diet in one's preadolescent daughter (Hamel, 2009a; Hamel, 2009b). Five items assessed whether participants think this person thinks they should encourage a healthy diet in their daughters, if they think this person encourages a healthy diet in their own children and if participants are motivated to comply with this referent. In addition to the most likely normative referent, two items were used to assess participants' perceptions of the aggregate of most important normative referents to determine if mothers think these people think they should encourage a healthy diet in their daughter and if they are motivated to comply with them. This measurement conforms to the traditional measurement of subjective norm in TPB research.

Three items assessed PBC by first asking participants to provide the first barrier that comes to mind that either prevents them from encouraging their daughters to eat healthily, or makes encouragement more difficult. These responses were coded using two trained coders and their coding reliability was assessed via Scott's *Pi* (Scott, 1955). The whole response was the unit of analysis and each was coded for type of barrier (*Pi* = .92). The two coders met and resolved any discrepancies in the coding. Participants were then

asked how severe they perceive this barrier to be and how likely they perceive it to prevent intent and actual encouragement of a healthy diet in their preadolescent daughters.

One item assessed behavioral intent by asking participants to indicate how likely they think they are to encourage a healthy diet in their preadolescent daughter in the future. Actual behavior (actual encouragement of their daughters to eat healthily) was assessed one week after the completion of the survey by asking mothers to complete a second survey and indicate whether they actually engaged in the behavior of encouraging a healthy diet in their daughters.

Previous research has suggested that messages of concern are likely to be significant predictors of intent to encourage a healthy diet in one's preadolescent daughter whereas messages of praise are not (Hamel, 2009a). Thus, only messages of concern regarding encouragement of a healthy diet were examined in this study (reduced likelihood of overweight/obesity and increased general social well-being).The emotions of interest (anger, sadness, and guilt) were conceptualized to act as mediators between message source and behavioral intent and actual behavior. A message of concern from one of the sources of interest, determined from previous research (own mother, mother in law, and another mother), and that are predicted to result in the emotions of interest (anger, sadness, and guilt) were presented to each participant. Two messages of concern were formed based on the conversations of the focus groups in the first study (Hamel & Smith, 2008). Six conditions were created such that there were two conditions for each message with each of the three sources. After reading one of the six message/source combinations, participants were asked to estimate how often they had heard this type of

messages from this source and if it was likely this source would present a message like this.

Participants were asked to assess how likely they think they would experience each emotion. The perceived likelihood of experiencing each emotion was measured with four items for each emotion after the messages of concern regarding encouraging a healthy diet in one's preadolescent daughter were presented. The items used to assess these emotions were partially adapted from Mitchell, et al. (2001).

Nine items assessed the particular previously specified mechanisms predicted to be associated with each emotion: solve a problem, overcome an obstacle, return to a state of happiness and contentment, reduce unpleasant feelings, or respond because of feelings of irritation, aggravation, reduced freedom and/or annoyance.

To assess perceived source credibility, participants then evaluated the source of the message by responding to 18 items which measured the credibility dimensions of competence, trustworthiness, and caring (McCroskey & Teven, 1999).

Participants also responded to items assessing if their families had histories of overweight/obesity and cancer. They also provided information regarding the structure of their family (number and ages of children, martial status) and their educational and ethnic backgrounds.

Responses regarding the components of the TPB, emotions, and source credibility were submitted to Confirmatory Factor Analysis (CFA; Hamilton & Hunter, 1988) to determine if the items assessing these separate components were measuring these constructs reliably. All scales were composed of seven-item Likert response scales.

All scales were fully retained due to the CFAs. The reliability of the two-item subjective norm scale for the most likely referent was α =.90, and the reliability of the two-item descriptive norm scale for the most likely referent was α = .80. The reliability of the five-item behavioral belief scale was α =.82 and the reliability of the five-item outcome evaluation scale was α =.70. The reliability of the four-item anger scale was α =.92, the reliability of the four-item sadness scale was α =.92, and the reliability of the four-item guilt scale was α = .89. The reliability of the six-item source competence scale was α =.93, the reliability of the six-item source caring scale was α =.90, and the reliability of the six-item source trustworthy scale was .94. See Tables 3 – 6 for a summary of the means and standard deviations of the variables assessed. Also see Tables 12 and 13 for correlation matrices of the relationships among the variables, one for each message.

If participants in the second stage of data collection indicated that they had encouraged their daughter to eat healthily in the last week, they were then asked to respond to an open-ended question about the situation of their most recent encouragement behaviors. These responses were coded using two trained coders and their coding reliability was assessed via Scott's *Pi* (Scott, 1955). The whole response was the unit of analysis. First, responses were coded by assessing if they described an encouraging or discouraging behavior (*Pi* = .80). Second, they were coded to determine if they included a specific food or type of food (*Pi* = .97) Last, responses were coded for mentions of future outcomes (*Pi* = .98). The two coders met and resolved any discrepancies in the coding (see Table 2 for coding categories).

Table 2

Coding Categories for Open-ended Data

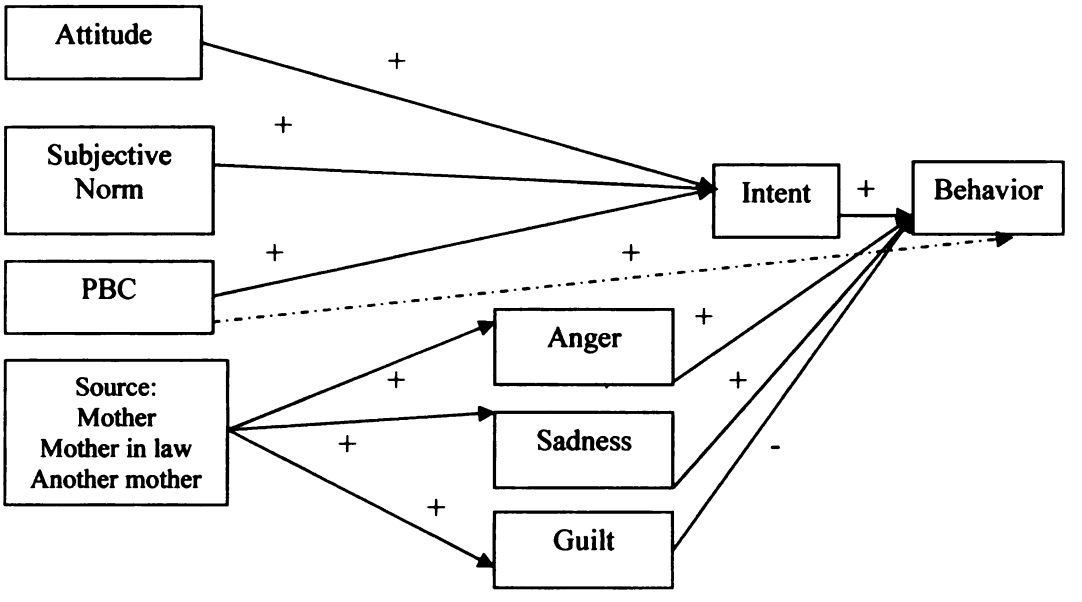
Behavior	*Food*	*Outcome*
1. Encourage	1. Fruit	1. Increased energy
2. Discourage	2. Vegetables	2. Improved digestion
3. Other	3. Meat/Protein	3. Improved skin
	4. Cheese	4. Increased strength
	5. Water	5. Working off sugar
	6. Skim Milk	6. Threat of a stomach ache
	7. General Healthy Food	7. Improved general health
Pi = .80	Pi = .97	Pi = .98

Path Model

The following is a graphic depiction of the path model that was predicted and tested.

Figure 2

Predicted Path Model



As is displayed in the previous model, the components of the TPB (attitude, subjective norm, and PBC) were conceptualized to influence intent and subsequently actual encouragement of a healthy diet independently. Attitude, subjective norm, and PBC were predicted to be positive predictors of intent and behavior. Messages of concern from the sources of interest were predicted to act separately from the TPB components. The action tendency emotions of interest were predicted to act as mediators between messages of concern from the sources and behavioral intent and subsequent behavior. That is to say, the emotions one may experience are the result of a message from a particular source which will also influence intent and behavior. It should be noted,

however, that previous research has shown that although the action tendency emotions of anger, sadness and guilt are all predicted to significantly influence intent and behavior, anger and sadness are predicted to be positive predictors while guilt is predicted to be a negative predictor.

Data Analysis

A linear regression analysis was conducted to determine if the independent variables were significant predictors of intent to encourage a healthy diet in preadolescent daughters. Specifically, the hypotheses regarding the components of the TPB, H1 which predicted attitude will positively predict intent, H2 which predicted the most likely subjective norm will positively predict intent, and H3 which predicted PBC will negatively predict intent, were tested by regressing these three independent variables on the dependent variable of intent to determine their predictive ability. The hypotheses regarding sources of emotion, H5 which predicted messages of concern from mothers in law and other mothers will evoke anger and H6 which predicted messages of concern from own mothers will evoke guilt were analyzed with analyses of variance with contrasts. RQ1 which asked whether messages of concern from mothers in law, other mothers and own mothers would be best at evoking sadness, and RQ2 which asked whether sources would differ in their perceived credibility were analyzed with analyses of variance.. The hypotheses regarding the influence of emotion on intent, H7 which predicted anger will positively predict intent, H8 which predicted sadness will positively predict intent, and H9 which predicted guilt will negatively predict intent were also analyzed through linear regression. The emotions were regressed on the dependent variable of intent to encourage a healthy diet in one's preadolescent daughter.

A logistic regression was then conducted with the same independent variables with the inclusion of intent but with engagement in the actual behavior of encouraging messages as the dependent variable to determine all of the previously outlined variables' predictive abilities on actual encouragement of a healthy diet in one's preadolescent daughter.

Last, to analyze the fit of the predicted causal model, the variables were tested as a structural equation model in AMOS to determine if the data were consistent with the predicted model.

Table 3

Means, Standard Deviations and Reliabilities of the Components of the Theory of Planned Behavior

Variable	Mean	Std. Dev.	Alpha
Most likely Subjective Norm	6.28	1.03	.90
Most likely Descriptive Norm	6.05	1.10	.80
Motivation to Comply with Most likely	5.48	1.30	* one item
Most important Subjective Norm	5.80	1.16	* one item
Motivation to Comply with Most important subjective norm	5.20	1.37	* one item
Control Belief Strength	3.39	1.67	* one item
Control Belief Power	4.82	1.59	* one item
Behavioral Beliefs	6.31	.67	.87
Outcome Evaluation	6.92	.26	.70
Behavioral Intention	6.56	.71	*one item
Attitude	43.71	5.35	*computed variable
Subjective Norm Most Likely	215.43	83.92	*computed variable
Perceived Behavioral Control	15.96	12.20	*computed variable

*All scales (except for computed variables) were 1-7 where 7 is high

Table 4

Means, Standard Deviations and Reliabilities of Emotions

Variable	Mean	Std. Dev.	Alpha
Anger	3.08	1.79	.92
Sadness	2.73	1.75	.92
Guilt	3.79	1.83	.89
Fear	2.65	1.88	*one item
Happiness/Joy	2.57	1.81	*one item
Pride	3.05	2.10	*one item
Compassion	3.47	1.91	*one item

*All scales were 1-7 where 7 is high

Table 5

Means, Standard Deviations and Reliabilities of Source Credibility

Variable	Mean	Std. Dev.	Alpha
Competence	5.02	1.45	.93
Caring	5.18	1.47	.90
Trustworthiness	5.58	1.38	.94

*All scales were 1-7 where 7 is high

Table 6

Means and Standard Deviations of Family Health

Variable	Mean	Std. Dev.	Alpha
Family Diet	5.61	1.06	*one item
Family history of overweight/obesity	3.49	1.96	*one item
Family history of cancer	4.10	1.93	*one item

*All scales were 1-7 where 7 is high

To ensure that the two messages of concern did not result in any unpredicted significant findings, independent sample t-tests were conducted. Although the messages used did not result in any differences in terms of emotions experienced (anger; t (126) = -1.42, p = .159, sadness; t (124) = .03, p = .975, guilt; t (125) = -.243, p = .81), perceptions of all three dimensions of credibility were significantly different as a result of the message. Specifically, sources were seen as more competent (t (118) = 2.44, p = .02), caring (t (123) = 2.63, p = .01), and trustworthy (t (124) = 2.16, p = .03) if participants read a message regarding the reduced likelihood of her daughter being overweight than a message about improvement of her social well being. Due to these unanticipated findings based on type of message, topic was included in the remaining analyses.

To determine if the TPB components and emotions were significant predictors of mothers' behavioral intent to encourage a healthy diet in their preadolescent daughters all of the factors were entered into a four-step regression analysis. To guard against nonessential multicollinearity the independent variables were mean-centered before they were entered into the equations (Cohen, Cohen, West, & Aiken, 2003).

Using hierarchical regression analysis, the three main predictor variables from the TPB (attitude, subjective norm, and PBC) were entered in the first block. According to Ajzen (2007) attitude is a product of behavioral beliefs and evaluations of those outcomes, subjective norm is the product of the normative measures and the motivation to comply, and perceived behavioral control is the product of control belief strength and control belief power, and that formula was followed here. Because of the significant differences found in terms of message topic and source, source and message were entered in the second block. The third block included the emotions of anger, sadness, and guilt, and the fourth and final block included the three dimensions of source credibility. The dependent variable of this analysis was behavioral intent.

No statistically significant interactions were found among the predictor variables, therefore no further blocks were added. The results are presented in Table 7.

Overall model/First block

The analyses showed that the overall model was significant, $F(11, 93) = 17.07$, $p < .001$, adjusted $R^2 = .34$. When the three main TPB components are entered into the first block of the regression analysis, attitude toward the behavior (unstandardized coefficient, B = .064, $p < .001$) was statistically significant, but the subjective norm of the person most likely to provide a message regarding the behavior (B = .001, $p = .23$) and PBC (B = .006, $p = .150$) were not. The results showed that the more positive the attitude the more strongly they intended to encourage their daughters to eat healthily. This explained 33.7% of the variance in intent to encourage.

Second block

When the source and message were entered into the second block attitude remained a significant predictor in addition to message (B = .224, $p < .05$). Source, however, was not a significant predictor. This block added an additional 3% to the variance of intent to encourage.

Third block

When the three emotions were included in the third block, attitude remained a significant predictor in addition to PBC (B = .009, $p < .05$). That is, the more control a mother felt she had over her most salient barrier, the more she intended to encourage her daughter to eat healthily. Message also remained a predictor of behavioral intent. However, none of the emotions (anger (B = .06, $p = .21$) , sadness (B = .06, $p = .28$), and guilt (B = -.05, $p = .313$) from a message of concern were significant predictors of behavioral intention. The addition of the third block reduced the total variance explained by 1.6%.

Fourth block

When the three dimensions of source credibility (competence, caring, and trustworthiness) were added in the fourth and final block, attitude, PBC, and message remained significant predictors of intent. However, none of the dimensions of credibility were found to be significant predictors of intent and the total variance explained was reduced by .9%. Overall attitude, PBC and message were the only significant predictors of intent to encourage a healthy diet in one's preadolescent daughter.

Table 7

Multiple Regression Analysis for Behavioral Intent to Encourage Daughter to Eat a Healthy Diet

	B	SE	B	T	Sr
First block					
First-order effect					
Attitude	**.064**	**.01**	**.546**	**6.535*** **	**.52**
Subjective Norm	.001	.001	.103	1.209	.096
PBC	.006	.004	.118	1.451	.116
	$F(3, 101) = 18.66, p < .001, R^2 = .357$, adjusted $R^2 = .337$				
Second block					
First-order effect					
Attitude	**.065**	**.010**	**.555**	**6.73****	**.52**
Subjective Norm	.001	.001	.093	1.10	.086
PBC	.008	.004	.158	.059	.150
Source	-.003	.060	-.003	-.043	-.003
Message	**.224**	**.102**	**.178**	**2.204***	**.173**
	$F_{change}(2, 99) = 2.44, p = .092, R^2_{change} = .03$				

Table 7 continued

Third block					
First-order effect					
Attitude	**.066**	**.010**	**.563**	**6.79****	**.535**
Subjective Norm	.001	.001	.097	1.14	.090
PBC	**.009**	**.004**	**.181**	**2.107***	**.166**
Source	-.049	.067	-.064	-.721	-.057
Message	**.213**	**.102**	**.169**	**2.08***	**.164**
Anger	.040	.044	.111	.918	.072
Sadness	.030	.059	.081	.504	.040
Guilt	-.020	.047	-.058	-.430	-.034
	$F_{change}(3, 96) = .882$, $p = .454$, $R^2_{change} = .016$				
Fourth block					
First-order effect					
Attitude	**.067**	**.010**	**.568**	**6.64****	**.528**
Subjective Norm	.001	.001	.092	1.038	.083
PBC	**.009**	**.004**	**.182**	**2.087***	**.166**
Source	-.051	.071	-.066	-.709	-.0

Table 7 continued

Message	**.209**	**.105**	**.166**	**1.993***	**.158**
Anger	.041	.045	.114	.914	.073
Sadness	.033	.060	.091	.554	.044
Guilt	-.024	.048	-.068	-.495	-.039
Source Competence	.053	.063	.117	.830	.066
Source Caring	-.080	.081	-.182	-.983	-.078
Source Trustworthy	.030	.090	.067	.332	.026

$F_{change}(3, 93) = .482$, $p = .695$, $R^2_{change} = .009$

The overall model: $F(11, 93) = 5.933$, $p < .001$, adjusted $R^2 = .343$

* $p \leq .05$

** $p \leq .001$

Predictors of Behavior

To determine whether the TPB components and emotions were significant predictors of mothers' actual encouragement of a healthy diet in their preadolescent daughters, all of the factors noted above plus intent were entered into a four-step logistic regression analyses. Again, to guard against nonessential multicollinearity, the independent variables were mean-centered before they were entered into the equations (Cohen, Cohen, West, & Aiken, 2003).

Using logistic regression analysis, four predictor variables from the TPB (attitude, subjective norm, PBC, and intent) were entered in the first block. Because of the

significant differences found in terms of message topic and source, source and message were entered in the second block. The third block included the emotions of anger, sadness, and guilt, and the fourth and final block included the three dimensions of course credibility. The dependent variable of this analysis was behavior.

Overall model

Neither the first block (χ^2 (4) = 2.176, p = .703) nor the overall model (χ^2 (12) = 4.93, p = .960) were significant in terms of predicting encouraging behavior. Moreover, the inclusion of the additional three blocks did not result in any significant predictors of behavior.

Table 8

Summary of Logistic Regression Analysis for Variables Predicting Encouragement Behavior

Predictor	B	SE β	Wald's χ^2	Df	P	e^{β}
First block						
Constant	-.955	.221	18.703	1	<.001	.385
Attitude	-.013	.050	.063	1	.802	.988
Subjective Norm	.00	.003	.097	1	.756	.999
PBC	-.017	.020	.753	1	.385	.983
Intent	-.225	.418	.289	1	.591	.799
	Test		2.176	4	.703	

Table 8 continued

Second Block						
Constant	-1.49	.891	1.665	1	.197	.317
Attitude	-.015	.051	.088	1	.767	.985
Subjective Norm	.000	.003	.102	1	.749	.999
PBC	-.018	.020	.769	1	.380	.982
Intent	-.200	.426	.221	1	.638	.818
Source	.198	.272	.531	1	.466	1.219
Message	-.149	.464	.104	1	.748	.861
	Test		.604	2	.739	
Third Block						
Constant	-1.358	.953	2.032	1	.154	.257
Attitude	-.021	.052	.166	1	.684	.979
Subjective Norm	-.001	.003	.116	1	.733	.999
PBC	-.021	.021	1.043	1	.307	.979
Intent	-.152	.433	.124	1	.725	.859
Source	.271	.302	.804	1	.370	1.311
Message	-.123	.467	.069	1	.793	.884
Anger	-.156	.201	.601	1	.438	.855

Table 8 continued

Sadness	.099	.269	.137	1	.712	1.105
Guilt	-.053	.216	.059	1	.807	.949
	Test		.774	3	.856	
Fourth Block						
Constant	-1.706	1.017	2.813	1	.094	.182
Attitude	-.011	.053	.041	1	.839	.989
Subjective Norm	-.001	.003	.108	1	.743	.999
PBC	-.024	.021	1.273	1	.259	.976
Intent	-.180	.439	.168	1	.682	.835
Source	.359	.318	1.271	1	.260	1.432
Message	-.030	.475	.004	1	.950	.971
Anger	-.113	.209	.293	1	.588	.893
Sadness	.096	.272	.124	1	.725	1.100
Guilt	-.072	.218	.109	1	.741	.930
Source Competence	.252	.297	.722	1	.396	1.287
Source Caring	-.034	.356	.009	1	.923	.966

Table 8 continued

Source Trustworthy	-.011	.399	.001	1	.978	.989
	Test		1.389	3	.708	
Overall			4.932	12	.960	

Hypothesis one predicted that mothers' attitudes toward encouraging a healthy diet in their preadolescent daughter(s) would be a significant predictor of their (a) behavioral intent and (b) actual encouragement of a healthy diet in the preadolescent daughter. The data were consistent with the intention prediction but not the actual behavior prediction. Mothers' attitude toward encouraging a healthy diet in their preadolescent daughter(s) was the biggest predictor of their intent to do so but not of their actual encouragement.

Hypothesis two predicted that mothers' most likely subjective norm (the personal most likely to talk to them about encouraging their daughter(s) to eat healthy diets) will be a significant positive predictor of their (a) behavioral intent and (b) actual encouragement of a healthy diet in their preadolescent daughter(s). The most frequently cited most likely subjective normative referent were the participant's own mothers (29.5%), their daughter's father (21. 2%), and pediatrician (18.9%). The data were not consistent with this prediction in regard to intent or behavior.

Hypothesis three predicted that mothers' perceived behavioral control over their most salient barrier will be a significant positive predictor of their (a) behavioral intent and (b) actual encouragement of a healthy diet in their preadolescent daughter(s). The

most frequently cited barriers to encouragement were their daughters' taste or preferences for certain foods (22.1%), time constraints (19.8%), and foods consumed outside of the home (9.9%). There data were consistent with the intention prediction but not with the behavior prediction. Control over their most salient barrier significantly predicted behavioral intent but not behavior.

Hypothesis four predicted that behavioral intent would be a significant positive predictor of mothers' actual encouragement of a healthy diet in their preadolescent daughter(s). The data were not consistent with this prediction.

Hypothesis five predicted that messages of concern from mothers-in-law and other mothers will invoke anger more so than messages from own mothers. A one-way analysis of variance with a contrast was conducted to compare the sources of mother-in-law and other mothers to own mothers. The results showed a significant difference for source on anger $t(125) = 4.58$, $p < .001$, $\acute{\eta}^2 = .18$, such that that mothers-in law ($M = 3.10$a, $SD = 1.58$) and other mothers ($M = 3.93$a, $SD = 1.94$) were significantly more likely to invoke anger than own mothers ($M = 2.10$b, $SD = 1.25$). Thus, the data were consistent with this prediction. Mothers-in-law and other mothers were more likely to invoke anger than own mothers. However, no source resulted in feelings of anger above the midpoint of the anger scale.

Hypothesis six predicted that messages of concern from own mothers will invoke guilt more so than messages from mothers-in-law and other mothers. A one-way analysis of variance with a contrast was conducted to compare the sources of mothers to messages from mothers-in-law and other mothers. The results showed no significant difference for

source on guilt $t(124) = -.63$, $p = .531$, $\acute{\eta}^2 = .01$. The data were not consistent with this prediction as no source was more likely to invoke guilt than any other source.

Research question one asked whether messages of concern from own mothers, mothers-in-law, and other mothers would differ in their ability to invoke sadness. A one-way analysis of variance was conducted to compare the sources of own mother, mothers-in-law and other mothers. The results showed a significant difference for source on sadness, $F(2, 123) = 7.26$, $p = .001$, $\acute{\eta}^2 = .11$. Post hoc contrast comparisons using Scheffe's procedure at $p < .05$, revealed that other mothers ($M = 3.46$a, $SD = 1.92$) were significantly more likely to invoke sadness than own mothers ($M = 2.14$b, $SD = 1.30$) and mothers-in-law ($M = 2.48$b, $SD = 1.69$). However, no source resulted in feelings of sadness above the midpoint of the scale.

Research question two asked whether sources differ in their perceived credibility (in terms of expertise, trustworthiness, and caring). Three one-way analyses of variance analyses were conducted to determine any perceived credibility differences based on source. These analyses revealed significant differences in terms of source competence $F(2, 117) = 8.06$, $p = .001$, source caring $F(2, 122) = 12.50$, $p < .001$, and source trustworthiness, $F(2, 123) = 12.95$, $p < .001$. Post hoc contrast comparisons using Scheffe's procedure at $p < .05$ revealed that own mothers ($M = 5.68$a, $SD = 1.01$) were perceived to be significantly more competent than other mothers ($M = 4.44$b, $SD = 1.49$) whereas mothers-in-law did not significantly differ from either ($M = 5.05$ab, $SD = 1.52$). Moreover, own mothers ($M = 5.66$a, $SD = 1.18$) and mothers-in-law ($M = 5.59$a, $SD = 1.27$) were seen as significantly more caring than other mothers ($M = 4.36$, $SD = 1.56$). Last, own mothers ($M = 6.07$a, $SD = 1.16$) and mothers-in-law ($M = 5.91$a, $SD = 1.23$)

were seen as significantly more trustworthy than other mothers (M = 4.79b, SD = 1.39). In sum, own mothers were seen as the most credible in terms of competence, caring, and trustworthiness whereas other mothers were seen as the least competent in these three dimensions.

Hypothesis seven predicted that anger evoked by concern messages would be a significant positive predictor of (a) behavioral intent and (b) actual encouragement of a healthy diet by mothers to their preadolescent daughter(s). The linear and logistic regressions determined that the data were not consistent with this prediction in terms of intent or behavior.

Hypothesis eight predicted that sadness evoked by concern messages will be a significant positive predictor of behavioral intent and actual encouragement of a healthy diet by mothers to their preadolescent daughters. The linear and logistic regressions determined that the data were not consistent with this prediction in terms of intent or behavior.

Hypothesis nine predicted that guilt evoked by concern messages would be a significant negative predictor of behavioral intent and actual encouragement of a healthy diet by mothers to their preadolescent daughters. The linear and logistic regressions determined that the data were not consistent with this prediction in terms of intent or behavior.

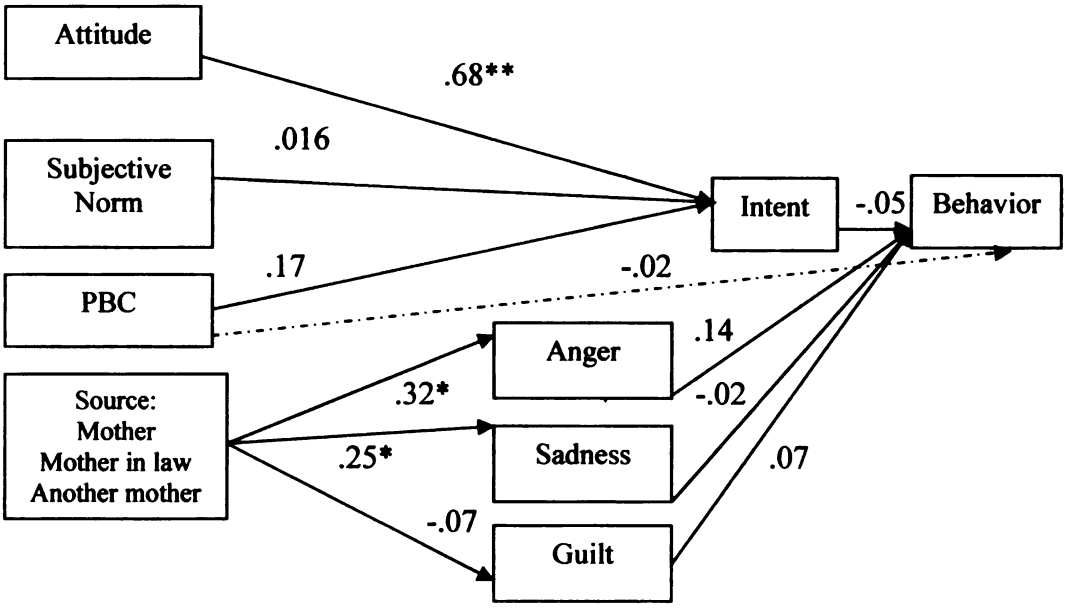
Path Models

To test the predicted path model, attitude, subjective norm, PBC, sources, anger, sadness, guilt, behavioral intent, and behavior were submitted to structural equation

model test. Due to the findings that there was a difference in perceived credibility based on message topic, two models (one for each message) were tested.

Figure 3

Path Model for Message One



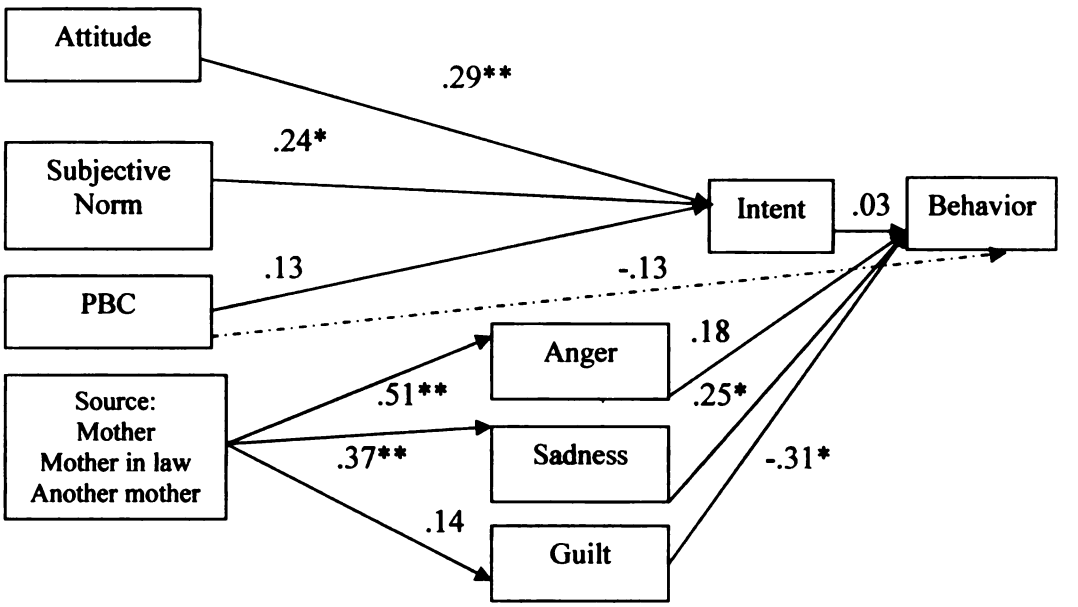
* $p \leq .05$

** $p \leq .001$

First, the proposed model was tested for only those participants in the conditions who read message one (encouraging your daughter to eat healthily will make her less likely to be overweight/ obese). Model fit indices were inadequate to accept the model (χ^2 (25, N = 64) = 144.99, p< .001, CFI = .234, RMSEA = .276).

Figure 4

Path Model for Message Two



* $p \leq .05$

** $p \leq .001$

Second, the proposed model was tested only for those participants in the conditions who read message two (encouraging your daughter to eat healthily will increase her social well-being) Model fit indices were inadequate to accept the model (χ^2 (25, N = 68) = 113.85, p< .001, CFI = .279, RMSEA = .230).

Reported Encouraging Behavior

Participants who returned to complete the second survey (N = 32) were asked whether or not they had encouraged their daughter(s) to eat healthily in the last week and if they did, to provide the description of their most recent encouraging behavior. The open-ended responses the units of analysis and were coded based on whether they involved instances of encouraging eating a certain type of food or discouraging eating

certain of type. They were also coded for what types of food were mentioned and if there were any outcomes discussed between mother and daughter. All of the participants who completed the second stage of the study reported a conversation with their daughter(s). Of the 32 reported stories about encouraging their daughters to eat healthily, 62.5% of them involved encouraging behavior, 15.6% of them involved discouraging behavior, and 21.9% involved general information about nutrition. A common encouraging behavior involved mothers encouraging healthy food as snacks or alternatives to less healthy foods such as fruit (40.6%) or vegetables (21.9%) or just general "healthier" foods (25.0%). Several participants also recounted telling their daughters about the positive outcomes (34.4%) of healthy eating, including increased energy, better general health, help with digestion, skin, and increased strength. The encouraging behaviors that included mentions of these types of outcomes are especially important as it has been found that encouragement from parents that includes information about the effects healthy eating has on physical and mental performance influence children's fat consumption, and encouragements that include information on how diet influences on one will feel and look influences fruit and vegetable consumption (Bourcier, et al., 2003).

Post Hoc Analyses

Table 9

Factor Loadings and Eigenvalues for Emotional Mechanisms

Scale and Item	Factors		Eigenvalue
	Factor 1	Factor 2	
Negative Feelings			
I would respond to this message because I was annoyed	.89	.10	4.49
I would respond to this message because I was irritated	.92	.19	.30
I would respond to this message because I was aggravated	.88	.27	.21
I would respond to this message because I do not like being told what to do	.74	.10	.11
Positive Outcome			
I would respond to this message so that I could feel happier	.12	.78	1.78
I would respond to this message so that I could feel more content	.18	.84	.53
I would respond to this message in order to solve a problem	.13	.76	.43

Table 9 continued

I would respond to this message in order to overcome an obstacle	.11	.72	.22

Due to the nonsignificant findings of the individual discrete emotions on action, a post hoc analysis of the emotional mechanisms was conducted to determine if intent or behavior may have been influenced by perceptions of broader states or possible future outcomes. The nine emotional mechanism items were submitted to an exploratory factor analysis with a varimax rotation. This analysis yielded two distinct factors with eigenvalues of 4.49 and 1.79 and *alpha* reliabilities of .90 and .79. One focused on negative reasons for responding to a message. These reasons included responding because of feelings of annoyance, aggravation, irritation, and feelings of reduced freedom. The other factor focused on future positive outcomes and included reasons for responding based on future happiness, contentment, the ability to solve a problem or overcome an obstacle. One mechanism item regarding a response based on eliminating unpleasant feelings did not cleanly load on either factor. In a post hoc analysis, these two factors were included in the linear and logit regression to determine if either of these overarching mechanisms predicted intent or actual behavior.

Table 10

Multiple Regression Analysis for Behavioral Intent to Encourage Daughter to Eat a Healthy Diet with Emotional Mechanisms

	B	SE	B	T	Sr
First block					
First-order effect					
Attitude	**.064**	**.01**	**.539**	**6.295****	**.514**
Subjective Norm	.001	.001	.111	1.279	.104
PBC	.006	.004	.122	1.457	.119
	$F(3, 97) = 17.701$, $p < .001$, $R^2 = .353$, adjusted $R^2 = .334$				
Second block					
First-order effect					
Attitude	**.065**	**.010**	**.550**	**6.529****	**.523**
Subjective Norm	.001	.001	.105	1.226	.098
PBC	.009	.004	.170	2.015	.161
Source	.004	.062	.005	.059	.005
Message	**.250**	**.105**	**.197**	**2.367***	**.190**
	$F_{change}(2, 95) = 2.85$, $p = .063$, $R^2_{change} = .037$				

Table 10 continued

Third block					
First-order effect					
Attitude	**.066**	**.010**	**.564**	**6.673****	**.533**
Subjective Norm	.001	.001	.088	1.006	.080
PBC	**.009**	**.004**	**.178**	**2.045***	**.163**
Source	-.064	.071	-.083	-.906	-.072
Message	.203	.108	.160	1.879	.150
Anger	.086	.053	.235	1.617	.129
Sadness	.038	.060	.104	.634	.051
Guilt	-.037	.051	-.104	-.726	-.058
Negative Response	-.076	.046	-.187	-1.671	-.134
Positive Outcome	.000	.049	.000	-.007	.000
	$F_{change}(5, 90) = 1.096$, $p = .368$, $R^2_{change} = .035$				
Fourth block					
First-order effect					
Attitude	**.067**	**.010**	**.569**	**6.512****	**.527**

Table 10 continued

Subjective Norm	.001	.001	.079	.868	.070
PBC	**.009**	**.004**	**.181**	**2.040***	**.165**
Source	-.065	.076	-.084	-.867	-.070
Message	.197	.111	.155	1.779	.144
Anger	.087	.055	.239	1.593	.129
Sadness	.037	.062	.099	.587	.047
Guilt	-.041	.053	-.116	-1.623	-.064
Negative Response	-.075	.046	-.184	-1.623	-.131
Positive Outcome	.012	.051	.026	.239	.019
Source Competence	.050	.066	.112	.753	.061
Source Caring	-.056	.085	-.128	-.658	-.053
Source Trustworthy	.003	.093	.007	.034	.003

$F_{change}(3, 87) = .297$, $p = .828$, $R^2_{change} = .006$

The overall model: $F(13, 87) = 5.072$, $p < .001$, adjusted $R^2 = .346$

* $p \leq .05$

** $p \leq .001$

Table 11

Summary of Logistic Regression Analysis for Variables Predicting Encouragement Behavior with Emotional Mechanisms

Predictor	B	SE β	Wald's χ^2	Df	P	e^{β}
First block						
Constant	-.904	.222	16.540	1	<.001	.405
Attitude	-.009	.050	.031	1	.860	.991
Subjective Norm	-.001	.003	.151	1	.697	.999
PBC	-.017	.020	.716	1	.397	.983
Intent	-.183	.418	.192	1	.661	.832
	Test		1.874	4	.759	
Second Block						
Constant	-.953	.901	1.117	1	.290	.386
Attitude	-.012	.051	.054	1	.816	.988
Subjective Norm	-.001	.003	.162	1	.687	.999
PBC	-.018	.020	.781	1	.377	.982
Intent	-.154	.429	.129	1	.720	.857
Source	.143	.275	.270	1	.603	1.153

Table 11 continued

Message	-.170	.471	.131	1	.718	.843
	Test		.371	2	.831	
Third Block						
Constant	-1.358	.953	2.032	1	.154	.257
Attitude	.002	.055	.001	1	.972	1.002
Subjective Norm	-.002	.003	.485	1	.486	.998
PBC	-.027	.023	1.381	1	.240	.974
Intent	-.302	.462	.428	1	.513	.739
Source	.135	.330	.168	1	.682	1.145
Message	-.418	.516	.657	1	.418	.658
Anger	.210	.255	.678	1	.410	1.233
Sadness	.104	.289	.129	1	.719	1.110
Guilt	-.294	.248	1.402	1	.236	.746
Negative Response	**-.583**	**.229**	**6.467**	**1**	**.011**	**.558**
Positive Outcome	.339	.226	2.251	1	.134	1.404
	Test		8.454	5	.133	

Table 11 continued

Fourth Block						
Constant	-.423	1.577	.072	1	.788	.655
Attitude	.012	.056	.048	1	.826	1.012
Subjective Norm	-.003	.003	.586	1	.444	.997
PBC	-.027	.023	1.395	1	.238	.973
Intent	-.326	.465	.490	1	.484	.722
Source	.220	.348	.402	1	.526	1.247
Message	-.336	.526	.410	1	.522	.714
Anger	.246	.262	.886	1	.347	1.279
Sadness	.081	.294	.077	1	.782	1.085
Guilt	-.309	.249	1.543	1	.214	.734
Negative Response	**-.572**	**.230**	**6.205**	**1**	**.013**	**.565**
Positive Outcome	.362	.237	2.346	1	.126	1.437
Source Competence	.278	.317	.767	1	.381	1.320
Source Caring	-.064	.379	.029	1	.865	.938

Table 11 continued

Source Trustworthy	-.060	.443	.019	1	.892	.941
	Test		1.076	3	.783	
Overall			11.775	14	.624	

To determine if the inclusion of the emotional mechanisms were significant predictors of mothers' actual encouragement of a healthy diet in their preadolescent daughters, all of the factors were again entered into a four-step logistic regression analyses. Again, to guard against nonessential multicollinearity, the independent variables were mean-centered before they were entered into the equations (Cohen, et al., 2003).

Using logistic regression analysis, four predictor variables from the TPB (attitude, subjective norm, PBC, and intent) were entered in the first block. Source and message were entered in the second block. The third block included the emotions of anger, sadness, and guilt, and the emotional mechanisms of negative response and positive outcomes, and the fourth and final block included the three dimensions of course credibility. The dependent variable of this analysis was behavior.

These additions to the logistic regression analysis revealed that the negative response emotional mechanism was the only significant, but negative, predictor of actual encouragement behavior ($B = -572$, $p < .05$). This finding suggests that if a message involves some type of negative response such as feeling annoyed, aggravated, or a loss of freedom the respondent is less likely to engage in encouraging behavior.

A simple analysis of the proportion of participants per condition who returned to complete the second stage of the study revealed that the percentage of returned participants in five conditions ranged from 13.6% to 28.6% whereas 42.9% of the women in the condition with a message regarding the reduced likelihood of one's daughter becoming overweight/obese from another mother returned and reported encouraging behavior. Due to this unanticipated discrepancy among the conditions and to further explore influences on future encouragement of a healthy diet in one's preadolescent daughter, a one-way analysis of variance with a contrast was conducted to determine if a particular source and message coupled together served as predictors. Among the six conditions (two for each source and three for each message), when another mother presented a message of concern that the mother had not encouraged a healthy diet and that encouragement could reduce the recipient's daughter's likelihood of becoming overweight/obese, participants were significantly more likely to engage in future encouraging behaviors, $t(126) = 2.176$, $p = .031$.

Table 12

Proportion of Return Response Per Condition

	Source			
	Own Mother	Mother-in-law	Another Mother	Marginal Means
Message One	19.0%	13.6%	42.9%	25.0%
Message Two	28.6%	18.2%	24.0%	23.5%
Marginal Means	23.8%	15.9%	32.6%	

Mean Comparison for Message: $t(130) = .196, p = .845$

Mean Comparison for Source with contrast: $t(129) = 1.63, p = .105$

DISCUSSION

The goal of this research was to add to existing knowledge about what influences mothers to encourage a healthy diet in their preadolescent daughters. This investigation utilized the TPB as a framework and included three discrete action tendency emotions (anger, sadness, and guilt) that have previously shown evidence as significant predictors of intent to encourage a healthy diet in one's daughter (Hamel, 2009a). This area of inquiry is important for two main reasons, one theoretical and one practical. Theoretically, the literature on action tendency emotions is still being developed, especially in terms of studies exploring the effects of discrete emotions on action. Practically, the relationship of focus here (between mothers and preadolescent daughters) has been shown to have great influence on the eating habits and, subsequently, the general health of preadolescent girls while still in preadolescence and beyond (Cutting, et al., 2007; Hill, et al., 1990). Thus, it is important to understand what influences mothers to encourage a healthy diet in their preadolescent daughters.

Theory of Planned Behavior

In terms of intent to encourage a healthy diet in one's preadolescent daughter, one's attitude toward encouraging and one's perceived behavioral control were found to be the biggest predictors. The finding regarding attitude, such that the more positively one views a behavior based on the perceived likelihood of outcomes and the evaluations of those outcomes, the more likely they will intend to engage in that behavior, has been found in past research in this area (Hamel, 2009b). An interesting contrast to the previous study and the current study comes from the findings regarding subjective norm and PBC. In previous research, the most likely subjective norm was found to be a significant and

positive predictor of intent to encourage, however, that was not the case here. Moreover, in previous research PBC was not found to significantly predict intent, although it was found to be in this case. One possible explanation for this difference in these findings, is that in the current study, the question of more salient barrier was left open-ended for the participants to respond to, while previous research provided a forced-choice item for barriers. It is possible that the current study was able to tap into barriers left unexplored in the previous step.

The current research provided an extension to previous findings by including actual behavior, rather than solely behavioral intent. Despite the findings that the attitude, PBC, and message type significantly predicted intent, none of these variables were predictors of actual behavior. Moreover, even behavioral intent was not a predictor of actual behavior. A possible explanation of this could be that only a subset of the original sample (24%) returned to complete the second stage of the survey regarding behavior thus statistical power was reduced. In addition it could be that the lack of findings was due to a type of self selection problem such that those who returned only did so because they actually did encourage their daughter in the previous week and wanted to recount their behavior. Also, the survey itself could have been a cue to action that resulted in encouragement behavior and that other variables may play a greater role in typical encouraging behavior under more typical circumstances. Finally, the lack of relationship between intent and behavior could be due to the ease of having intent and the difficulty of actually engaging in the behavior. Put another way, one can intend to do many behaviors (especially prosocial behaviors such as encouraging a healthy diet in the one's preadolescent daughter), but when it comes down to moving from intent to the behavior,

barriers prevent the behavior from happening. For example, the most frequently cited barriers to encouraging a healthy diet in one's preadolescent daughter(s) were the daughter's taste or preference for certain foods and time constraints. It could be the case intent to encourage a healthy diet could not overcome the fact that any amount of encouragement cannot change a daughter's food preferences or a family's busy schedule.

Sources

The sources used in the current research were based on findings from a previous focus group study concerned with determining what sources would be most likely to invoke particular discrete emotions (Hamel & Smith, 2008). These qualitative data suggested that mothers, mothers-in-law, and other mothers were most likely to elicit the emotions of anger, sadness, and guilt but to possibly varying degrees. The current research offered an empirical test of these initial qualitative data. It was found that certain sources are more likely to elicit discrete emotions than others. Specifically, mothers-in-law and others mothers were more likely to invoke anger than own mothers and other mothers were most likely to invoke sadness than own mothers and mothers-in-law.

Moreover, sources were assessed on their perceived credibility in terms of competence, caring, and trustworthiness. Own mothers were perceived to be the most credible in all three dimensions whereas other mothers were seen to be the least credible in all three dimensions. This reduced credibility could account for the experience of negative emotions of anger and sadness from less credible sources (mothers-in-law and other mothers) versus more credible sources (own mothers). Although different sources were found to elicit different emotions, none of these emotions lead to intent or actual

behavior. Perhaps viewing these sources from a credibility perspective could lead to more fruitful understanding of source influence on behavior. Rather than looking to emotion as the influence on behavior, perhaps examining the various dimensions of source credibility on intent and behavior will shed further understanding on this relationship. For example, future research could examine whether past history with each individual source influences perceived credibility and whether that credibility influences intent and behavior. It could be the case that if a source has provided helpful and successful advice (whether in terms of healthy living or otherwise) may influence whether or not they promote intent and actual encouragement behaviors.

Emotions

The discrete, negative emotions of anger, sadness, and guilt were included in this study as predictors of intent and actual encouragement of a healthy diet in one's preadolescent daughter(s). These emotions were included in this study because previous research has indicated that they are significant predictors of intent to encourage (Hamel, 2009a). That research showed that anger and sadness were positive predictors whereas guilt was a negative predictor. The current research sought to determine whether those findings could be replicated and then extended to actual behavior. The data were not consistent with any of these predictions. Although the regression analyses indicated these emotions were working in the predicted direction (anger and sadness were positive and guilt was negative), the significant findings from previous research were not replicated.

The predictions concerning the ability of discrete emotions to influence behavior were not substantiated, therefore a post hoc analysis involving positive and negative emotional mechanisms was conducted to determine if intent and/or behavior was due to a

broader influence rather than discrete emotions. The exploratory factor analysis revealed two factors for the emotional mechanisms, one centers on responses motivated by negative feelings such as being aggravated or annoyed and the other on responses to achieve more positive feelings such as feeling happier or overcoming an obstacle or solving a problem.

When these factors were included in subsequent analyses on intent and behavior, the response motivated by negative feelings was the only significant predictor of actual encouraging behavior. However, this predictor was negative. This means that the more participants thought they would feel annoyed and aggravated by the message the less likely they were to encourage their daughters to eat healthily. This finding maybe the result of feelings of reactance, defined as a response when an individual perceives a threat to a freedom and will not acquiesce to the requested action as a means to reestablish personal freedom (Brehm & Brehm, 1981). This finding is contrary to what has been found in regard to the negative emotion of anger (AAM; Turner, 2007) or negative emotions in general (NSR; Cialdini, Darby, & Vincent, 1973). Specifically the AAM and the NSR are based on evidence that once an individual feels a negative emotion, they will engage in some type of constructive behavior as a means to assuage their goal incongruent feelings. However, this reactance finding is more in line with what has been found in the past in regard to the emotion of guilt (O'Keefe, 2002). Past research on guilt has found that persuasive messages that invoke guilt, tend *not* to lead to greater persuasion or behavior change (O'Keefe, 2002). This lack of persuasion is thought to be due to feelings of irritation or annoyance. The findings from the current

study fit more in what has been found about guilt reaction than other negative emotional reactions such as the AAM and the NSR.

Message Topic

A major unanticipated finding in this study was that there was an effect found for message topic on perceived credibility of the source of the message. Specifically, two messages were presented to participants, one about how a mother's encouragement of a healthy diet will reduce the likelihood of her daughter becoming overweight and obese and the other focused on how a mother's encouragement will improve her daughter's overall social well-being. All sources were seen as significantly more credible (in terms of competence, caring, and trustworthy) when they provided the first message as compared to the message second message. Moreover, when all six conditions are compared (two messages by three sources) the condition when another mother gives the first message about overweight and obesity was the condition most likely to result in future encouraging behavior. This is especially interesting because although this source was seen as the least credible in competence, caring, and trust, they were the source most likely to influence future behavior when giving the obesity message. Perhaps this response has something to do with a social judgment component of the message. Specifically, if a source that is not seen to be as competent, trustworthy, or caring makes a comment about the future weight status of one's daughter, the social consequences of being overweight (e.g. getting made fun of or social isolation) might become more salient and thus mothers respond constructively.

This research provides further support for what is already known about what influences this population to encourage a healthy diet in their preadolescent daughters

and also sheds light on what areas still need work. Specifically, the finding regarding attitude as a significant positive predictor of intent was replicated from the previous work. Of all of the factors explored thus far, attitude appears to be the most important in terms of intent to encourage. Moreover, this research adds to the TPB research in that it provides further support of the theory's applicability to another area of inquiry.

This research also adds to the action tendency emotion literature by demonstrating that inducing emotion requires more powerful messages or stimuli (based on the fact that no emotion was reported over the midpoint of the scale). In addition, although no discrete emotion was a significant predictor of intent or behavior, a broader negative response to a message was found to be a negative predictor of behavior. This may be evidence that negative emotions are working in tandem to influence behavior and research effort would be well-served to not solely focus on discrete emotions but instead an aggregate of those emotions, similar to what is already being done in the NSR.

Implications

The most important implication from this work is that crafters of messages targeting this population that attempt to persuade them to encourage a healthy diet in their preadolescent daughters must be wary of the perceptions of this population. Specifically, crafters of these messages should be careful not to irritate or aggravate this population or else the exact opposite of the desired behavior may occur. In addition, because this population's attitude is the greatest predictor of intent, persuasive attempts should continue to promote the perceived outcomes of encouraging one's daughter to eat healthily and evaluations of these outcomes. These data indicate that this population already perceives positive outcomes of this behavior and they also evaluate those

outcomes quite positively, thus efforts to maintain this attitude should subsequently maintain intent.

Future Research

Researchers involved in the future steps of this program of research would be well-served to put further thought into what relationship action tendency emotions have on different types of persuasion goals. Specifically, if there is a difference in the types of emotions that influence whether or not one is changing a behavior, maintaining a behavior, or engaging in behavior cessation. The current research effort did not differentiate whether mothers were continuing to encourage a healthy diet or just beginning to.

In addition, due to the unanticipated effect on message type in the current effort, future messages should be crafted and pretested more carefully to determine what emotions will result from encountering them. Somewhat related to the pretesting and designing of future messages is the presentation of these messages. Participants in the current effort merely read a message off of a computer screen that was intended to be from one of the three sources and it was left up to them to imagine that source. Messages that take advantage of richer sources of communication such as audio and/or visual components may have a greater influence on intent and behavior.

Limitations

Of course this effort is not without its limitations. As previously mentioned, no emotion was reported to be experienced over the midpoint of seven-point scale. Although varying levels of anger, sadness, and guilt were experienced, it could be the case that the messages in this study were not powerful enough to induce emotions to the degree they

need to be experienced to promote intent or behavior. Future research would be well served to craft messages that induce these emotions to a greater degree to further test their action ability. Also, the messages in this study were read off of a computer screen without any addition audio or visual stimulation. Perhaps messages that are received through more active channels of communication and that are more stimulating could induce the emotions of interest to a greater degree.

After participants read the message of concern they were asked how frequently they have actually received this type of message from the source and how likely this source would be to actually say this message. A large majority of respondents (83.3%) indicated that they have never received this message from the source and 40.2% of participants strongly disagreed that this message would ever come from this source. This lack of realism may also have been a limitation of this study. Specifically, if these messages are perceived as unlikely, then they may not have the influence on intent and behavior that was predicted. This is also evidence that these sources may be unlikely to tell others when they are concerned when a mother is not encouraging a healthy diet for her daughter(s). Another limitation of the messages of the current research is that they were not pretested on a separate sample of respondents. This may account for the finding that one message resulted in higher ratings of source credibility that the others.

Another limitation to this survey especially in terms of gathering behavior data, is that the first survey may have been cue to action in and of itself. Because the survey instrument did not mask what it was assessing, it is possible that just completing the survey made the behavior of encouraging a healthy diet more salient. Moreover, because

respondents were asked to return in a week, they may have been cognizant of their encouraging behaviors in case they were asked to report on them.

Also, the sample assessed had a skewed socioeconomic status, based on education level. Specifically, almost half of the sample completed graduate school. This may reduce the generalizability of the results found here, especially in terms of control over one's behavior. Specifically, this group may differ in their barriers to action than other samples would. For instance, it could be the case that this sample did not perceive barriers such as cost or availability of healthy food as a barrier at all.

Conclusion

This effort was designed to explore further the influences on mothers' intent and actual encouragement of a healthy diet in their preadolescent daughters. Overall it was found that attitude, PBC, and message type influence intent significantly while a broad negative response mechanism was the only predictor of actual encouragement behavior. Practitioners should be aware of the responses to their messages targeting this population, especially in terms of avoiding aggravation or irritation as they may result in undesired behaviors.

APPENDIX A

Web Survey Measurements

Theory of Planned Behavior Measurements

Subjective Norm

Think about the person who you know is most likely to send you a message encouraging you to encourage your daughter to eat a healthy diet

Now please respond to the following items with this person in mind:

Who is that person? (drop down menu):

{ } Mother

{ } Father

{ } Mother-in-law

{ } Father-in-law

{ } Sister(s)

{ } Brother(s)

{ } Daughter's father

{ } Husband (if not your daughter's father)

{ } Pediatrician

{ } Dentist

{ } Close friends

{ } Mothers of your daughter's friends

Subjective Norm – most likely

This person thinks I should encourage my daughter to eat a healthy diet

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

This person expects me to encourage my daughter to eat a healthy diet

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Descriptive Norm – most likely

This person would encourage his or her child/ren to eat a healthy diet

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

This person does encourage his or her child/ren to eat a healthy diet.

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Motivation to comply – most likely

When it comes to encouraging my daughter to eat a healthy diet, I want to do what this person thinks I should do.

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Subjective Norm – most important

Most people that are important to me think I should encourage my daughter to eat a healthy diet

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Motivation to comply – most likely

When it comes to encouraging my daughter to eat a healthy diet, I want these people think I should do.

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Perceived Behavioral Control

In the space below please describe the first barrier that comes to mind that either prevents you from encouraging your daughter to eat healthily or makes encouraging your daughter to eat healthily more difficult

OPEN ENDED

Control belief strength

I expect that the most major barrier I selected will prevent me from encouraging my daughter to eat a healthy diet

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Control belief power

My most major barrier will make it more difficult to encourage my daughter to eat a healthy diet.

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Behavioral beliefs

Encouraging my daughter to eat a healthy diet will:

Help her to have good overall health now:

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Make her less likely to become overweight/obese as a preadolescent:

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Help her to choose healthy foods to eat instead of unhealthy foods:

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Help prevent her from getting a serious disease, such as cancer, as an adult:

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Outcome evaluations

Helping my daughter to have good overall health now is:

bad :___1:___2:___3:___4:___5:___6:___7: good

Helping my daughter to be less likely to become overweight/obese as an adolescent is:

bad :___1:___2:___3:___4:___5:___6:___7: good

Helping my daughter to be less likely to become overweight/obese as an adult is:

bad :___1:___2:___3:___4:___5:___6:___7: good

Helping my daughter choose healthy foods to eat instead of unhealthy foods is:

bad :___1:___2:___3:___4:___5:___6:___7: good

Helping to prevent my daughter from getting a serious disease, such as cancer, as an adult is:

bad :___1:___2:___3:___4:___5:___6:___7: good

Behavioral Intention

I am going to encourage m daughter to eat a healthy diet

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Messages

Messages of concern varied by source

1: Imagine the following was said to you by **your own mother**.

"I am concerned with whether you talk with your daughter about her eating habits. You know, if you encourage her to eat better she will be less likely to be overweight as a child and as an adult."

2: Imagine the following was said to you by **your own mother**.

"I am concerned with whether you talk with your daughter about her eating habits. You know, if you encourage her to eat better she will be more likely to experience more general social well-being as a child and as an adult."

3: Imagine the following was said to you by **your mother in law**.

"I am concerned with whether you talk with your daughter about her eating habits. You know, if you encourage her to eat better she will be less likely to be overweight as a child and as an adult."

4: Imagine the following was said to you by **your mother in law**.

"I am concerned with whether you talk with your daughter about her eating habits. You know, if you encourage her to eat better she will be more likely to experience more general social well-being as a child and as an adult."

5: Imagine the following was said to you by **a mother of one your daughter's classmates**.

"I am concerned with whether you talk with your daughter about her eating habits. You know, if you encourage her to eat better she will be less likely to be overweight as a child and as an adult."

6: Imagine the following was said to you by **a mother of one your daughter's classmates.**

"I am concerned with whether you talk with your daughter about her eating habits. You know, if you encourage her to eat better she will be more likely to experience more general social well-being as a child and as an adult."

How often has your mother/mother in law/mother of one of your daughter's class mates said something like this to you in the past?

Never

1-2 Times

3-4 times

5-6 times

7-8 times

9-11 times

12 or more

Your mother would say something like this.

Strongly Disagree :___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Emotion Measurements

Please indicate how much you would experience each of the following emotions after hearing the previous message.

	None	Almost none	Slightly none	Neutral	A little	Some	A lot
Anger							
Sadness							
Guilt							
Fear							
Happy/Joy							
Compassion							
Pride							

Anger:

Mad

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Rage

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Furious

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Sadness:

Miserable

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Depressed

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Gloomy

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Guilt:

Blame:

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Responsible

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Regret

I feel none of this:___1:___2:___3:___4:___5:___6:___7: I feel a lot of this

Emotional Mechanism Measures

I would respond to this message so that I could feel happier. (*anger and sadness*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message so that I could feel more content. (*anger and sadness*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message in order to solve a problem. (*anger and sadness*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message so that I could get rid of any unpleasant feelings. (*anger and sadness*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message in order to overcome an obstacle. (*anger*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message because I was irritated. (*guilt*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message because I was annoyed. (*guilt*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message because I was aggravated. (*guilt*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

I would respond to this message because I do not like being told what to do. (*guilt*)

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

Source Credibility Measures

Competent

Intelligent

Intelligent:___1:___2:___3:___4:___5:___6:___7: Unintelligent

Trained

Untrained:___1:___2:___3:___4:___5:___6:___7: Trained

Expert

Inexpert:___1:___2:___3:___4:___5:___6:___7: Expert

Informed

Informed:___1:___2:___3:___4:___5:___6:___7: Uninformed

Competent

Incompetent:___1:___2:___3:___4:___5:___6:___7: Competent

Bright

Bright:___1:___2:___3:___4:___5:___6:___7: Stupid

Caring

Cares about me

Cares about me:___1:___2:___3:___4:___5:___6:___7: Does not care about me

Has my interest at heart

Has my interest at heart:___1:___2:___3:___4:___5:___6:___7: Does not have my interest at heart

Self-centered

Self-centered:___1:___2:___3:___4:___5:___6:___7: Not self-centered

Concerned with me

Concerned with me:___1:___2:___3:___4:___5:___6:___7: Not concerned with me

Sensitive

Insensitive:___1:___2:___3:___4:___5:___6:___7: Sensitive

Understanding

Not understanding:___1:___2:___3:___4:___5:___6:___7: Understanding

Trustworthy

Honest

Honest:___1:___2:___3:___4:___5:___6:___7: Dishonest

Trustworthy

Untrustworthy:___1:___2:___3:___4:___5:___6:___7: Trustworthy

Honorable

Honorable:___1:___2:___3:___4:___5:___6:___7:Dishonorable

Moral

Moral:___1:___2:___3:___4:___5:___6:___7:Immoral

Ethical

Unethical:___1:___2:___3:___4:___5:___6:___7: Ethical

Genuine

Phony:___1:___2:___3:___4:___5:___6:___7: Genuine

Family Structure, Health and Demographics Measurements

My family and I eat healthy diets.

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

My family has a history of overweight/obesity.

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

My family has a history of cancer.

Strongly Disagree:___1:___2:___3:___4:___5:___6:___7: Strongly Agree

What is your age?

OPEN ENDED

Please use the pull down menu to indicate the age of one of your daughters between 6 and 11 years of age.

6

7

8

9

10

11

Please indicate the age of your second daughter between 6 and 11 years of age. If this does not apply to you please ignore.

6

7

8

9

10

11

Please indicate the age of your third daughter between 6 and 11 years of age. If this does not apply to you please ignore.

6

7

8

9

10

11

Please indicate the age of your fourth daughter between 6 and 11 years of age. If this does not apply to you please ignore.

6

7

8

9

10

11

If you have any other children besides your daughter(s) between 6 and 11 years of age, please use the pull down menu below to indicate how many.

1

2

3

4

5

6

7

What is your martial status?

Single

Engaged

Married

Divorced

Long-term relationship but not married

What is your ethnicity? Select all that apply.

Caucasian

African

Hispanic/Latino

Asian

Other

What is your level of education?

Some high school

Completed high school

Some college or post high school training

Completed college or post high school training

Some graduate school

Completed graduate school

Second Survey -- Behavior

Have you encouraged your preadolescent daughter to eat healthily in the last week?

Yes

No

In the space below please describe the most recent conversation that you had with your daughter encouraging her to eat healthily during the past week.

In the space below, please report on why you have not encouraged your daughter to eat healthily in the last week?

APPENDIX B

Correlation Matrices

Table 13

Correlation Matrix for Message 1

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Source													
2. Attitude	.10												
3. Subj Norm	.03	.20											
4. PBC	-.05	.05	-.08										
5. Anger	.33*	.00	-.03	..21									
6. Sad	.25	.05	.03	-.24	.72*								
7. Guilt	.07	-.03	.02	-.29*	.52*	.85*	.						
8. Negative Response	.25	-.07	-.01	-.26*	.71**	.45**	.29*						
9. Positive Outcome	.21	-.12	-.03	-.12	.31*	.53**	.57**	.28*					
10. Comp.	-.28*	-.08	-.02	-.04	-.10	-.01	-.01	-.22	-.04				
11. Caring	-.28*	-.03	.01	.01	-.11	-.07	-.06	-.12	.07	.72**			
12. Trust	-.34*	-.04	-.05	-.04	-.06	-.04	.03	-.15	.00	.74**	.86**		
13. Intent	.00	.69*	.17	.16	.13	.13	.06	-.07	-.18	-.03	-.10	-.08	
14. Behave	.22	.04	.05	-.03	.10	.06	.06	-.16	.09	.13	.01	.03	-.05

* $p \leq .05$

** $p \leq .001$

Table 14

Correlation Matrix for Message 2

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Source													
2. Attitude	-.14												
3. Subj Norm	.01	.40**											
4. PBC	-.03	-.07	.127										
5. Anger	.51**	-.19	-.11	-.26*									
6. Sad	.38*	-.11	-.06	-.10	.66**								
7. Guilt	.13	-.07	-.12	-.16	.50**	.72**							
8. Neg. Response	.23	.05	.09	-.23	.60**	.38*	.23						
9. Pos. Outcome	.00	.01	.001	-.25*	.34*	.51**	.59**	.43**					
10. Comp.	-.40*	-.07	-.04	-.37*	-.38*	-.21	-.06	-.25	-.07				
11. Caring	-.43**	-.01	-.01	.25*	-.34*	-.15	-.04	-.16	-.01	.79**			
12. Trust	-.41**	-.02	-.07	.23	-.32*	-.22	-.06	-.13	.01	.82**	.88**		
13. Intent	.07	.33*	.26*	.14	.11	.12	..07	.12	.00	.03	.11	.08	
14. Behave	-.04	-.07	.02	-.13	-.16	-.02	-.14	-.12	.01	.11	.17	.12	.01

* $p \leq .05$

** $p \leq .001$

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