KEEPING CHILDREN HEALTHY –

HOW THE EFFECTS OF NORMATIVE MESSAGES ON PARENT INTENTIONS VARY WITH SOCIAL NORMATIVE BELIEFS AND PERSONALITY

Nehama Lewis-Persky

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Supervisor of Dissertation

Robert Hornik, Raymond Williams Professor of Communication

Graduate Group Chair

Katherine Sender, Associate Professor of Communication

Dissertation Committee

Joseph N. Cappella, Gerald R. Miller Professor of Communication

Paul Messaris, Lev Kuleshov Professor of Communication

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ABSTRACT

KEEPING CHILDREN HEALTHY –

HOW THE EFFECTS OF NORMATIVE MESSAGES ON PARENT INTENTIONS VARY WITH SOCIAL NORMATIVE BELIEFS AND PERSONALITY

Author: Nehama Lewis-Persky

Supervisor: Robert Hornik

This dissertation describes studies which apply theory from the fields of communication and social psychology to create and test persuasive messages aimed at increasing parental intention to provide healthy nutrition and perform sun protection behaviors for their children. These behaviors have been shown to be significantly associated with the risk of developing cancer later in life. The experiments tested whether the manipulation of the observability of a health behavior and exposure to normative (i.e. stresses injunctive norms) or attitudinally focused messages (i.e. stresses health benefits of the behavior), could influence the normative route to intention to perform preventive health behaviors.

The first study randomized participants to a behavioral scenario in which the health behavior is described as occurring in an observable or non-observable setting. The effects of observability were tested in the contexts of nutrition and sun protection behaviors. A second study tested the effect of normative compared with attitudinal messages on the relative weight given to attitudes and norms in forming intention to perform preventive health behaviors among parents of young children. This study also

tested the interaction between two individual level traits - other-directedness and identification with other parents - and exposure to normatively focused messages.

For sun protection behaviors, observability primed the influence of social norms on intention. Among parents who reported lower levels of social norms, observability reduced intention to practice sun protection behaviors. Among parents who reported higher levels of social norms, observability increased intention. In addition, among participants exposed to a normative message about nutrition, identification with other parents was shown to moderate the effects of message type on intention to serve one's child healthy foods. Results also showed some evidence to support an interaction between self-consciousness and exposure to message type among parents surveyed about nutrition. Parents who were more attuned to their own beliefs and values when forming intentions (i.e. high in self-consciousness) were more vulnerable to the effects of attitudinally focused messages about nutrition than parents who were low in this trait.

Possible explanations for the findings, as well as implications for future research are discussed.

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INTRODUCTION

This dissertation aims to contribute to knowledge about factors which might affect the extent to which norms influence intention to perform preventive health behaviors. This study will address this question through three different approaches, including examining hypotheses based on the interaction between these elements and their influence on the normative route to intention:

1. **Behavior focus – public vs. private**

   Will manipulating the observability of a behavior, its public versus private nature affect the association between social norms and intention?

2. **Individual traits**

   Will personality trait measures which capture the extent to which parents are attuned to their social environment vs. inwardly focused influence the effect of social norms on health behavior?

3. **Message focus**

   Are parents exposed to a message emphasizing social norms likely to react differently than parents exposed to a message emphasizing health benefits, i.e. outcome focused, (or no message)?.

First, the study will apply the Integrated Model of Behavior Change (Fishbein, 2000; Fishbein et al., 2002) to predict two types of health behaviors among parents of young children – nutritional choices and sun protection. The objective will be to demonstrate the extent to which the model accounts for variation in intention. Following

this, the next step will be to test whether the public/private nature of the behavior influences the effects of social norms on intention. This stage aims to determine whether the presence of another parent in the same behavioral scenario will influence the norm-intention association (i.e. through priming the effect of social norms on intention).

The study will then explore the interaction between the observability of the behavior and message type - exposure to normative message type (vs. attitudinal message type or no message). This stage aims to determine whether a message which emphasizes the importance of social expectations will have a greater influence on intention under conditions of observability.

Following this, the effects of message type on the attitude-intention and norms-intention relationship will be tested, when the influence of social norms on intention is expected to vary according to the type of message to which parents are exposed. Among parents exposed to a normatively focused message, the norm-intention association is expected to be primed. In contrast, among parents exposed to an attitudinally focused message, the attitude-intention association is expected to be primed.

The study will then address the central question by testing the interactions between stable individual level traits, message type, and the observability of the behavioral scenario. The first interaction to be tested will be the influence of identification with other parents (i.e. the extent to which parents report that they identify with other parents of young children) and message type. Among parents exposed to a normatively focused message, identification with other parents is expected to be positively associated with intention, but is not expected to influence intention among

parents exposed to an attitudinally focused message or no message. The interaction between personality traits and message type will then be tested when parents who are classified as high in other-directedness (i.e. are more attuned to others vs. self in forming intention) are expected to report greater intention when exposed to a normatively focused message. In contrast, parents classified as low in other-directedness are expected to report greater intention when exposed to an attitudinally focused message.

Finally, the interactions between personality traits and observability will be tested when the influence of the presence of another parent (i.e. observability of behavior) is expected to be greater among parents who are high in other-directedness. Similarly, parents who are more attuned to their own beliefs in forming intention (high in private self-consciousness) are expected to be less influenced than other parents by the presence of another parent.

CHAPTER 1

BACKGROUND AND LITERATURE REVIEW

1.1 Sun protection and skin cancer

Skin cancer is the most common form of cancer in the United States and accounts for more than 1 million new cases of cancer diagnosed annually, nearly half of all cancers diagnosed in the United States (American Cancer Society, 2009). The incidence of skin cancer has also increased worldwide in the last decade (American Cancer Society, 2008; Jemal, Devesa, Hartge, & Tucker, 2001). The American Cancer Society estimates that melanoma, the most serious type of skin cancer, will account for about 68,720 cases of skin cancer in 2009 and most (about 8,650) of the 11,590 deaths due to skin cancer each year (American Cancer Society, 2009). More than 20 American die each day from skin cancer, primarily melanoma (American Cancer Society, 2009). The economic costs of skin cancer are also high; in 2004, the total cost associated with the treatment for non-melanoma skin cancers was more than $1 billion (Bickers, Lim & Margolis, et al. 2006).

Risk factors

Risk factors vary for different types of skin cancer. For melanoma, major risk factors include a personal or family history of melanoma and the presence of atypical moles or a large quantity of moles (greater than 50). Other risk factors for skin cancer include fair skin, red or blonde hair, propensity to burn, inability to tan, and diseases that suppress the immune system (American Cancer Society, 2008). Skin cancer is

considered one of the most preventable types of cancer. Preventable risk factors include exposure to ultraviolet (UV) radiation, use of tanning booths; and occupational exposure to coal tar, pitch, creosote, arsenic compounds, or radiation (American Cancer Society, 2008). About 90 percent of non-melanoma skin cancers are associated with exposure to ultraviolet (UV) radiation from the sun (Armstrong & Kricker, 1993). Sunburns, a short-term consequence of unprotected or excessive UV exposure, were reported more frequently by men than women. This might be attributed to different sun-protection behaviors or different sun-exposure conditions between men and women (e.g., differences in leisure or work activities). In addition, women might be more concerned about the cosmetic effect of long-term sun exposure (e.g. wrinkling of the skin and the appearance of age spots) and thus might be more likely to avoid sun exposure, use makeup with sunscreen, or practice sun-protection behaviors (Abroms, Jorgenson, & Southwell, et al. 2003). Variations by race, ethnicity, and gender were observed with the highest prevalence of sunburns among white non-Hispanic males and females. Melanoma rates are more than 10 times higher in Whites than in African Americans. However, it should be noted that race/ethnicity is a poor proxy for skin cancer risk because persons in racial/ethnic minority groups might have individual risk factors for skin cancer (e.g. lighter skin color; skin that burns, freckles, or reddens easily in the sun; or personal or family history of skin cancer) and might not benefit from the protective effects of melanin (Center for Disease Control, MMWR, 2007).

Prevention

A large proportion of the skin cancers diagnosed in the United States each year could be prevented if sun protection habits were adopted at an early age. According to the American Cancer Society (2008), most skin cancer can be prevented by: (1) Reducing sun exposure especially during the midday hours (10 a.m. to 4 p.m.) (2) When outdoors, seeking shade and wearing a hat that shades the face, neck, and ears, a long-sleeved shirt, and long pants (3) Wearing sunglasses to protect the skin around the eyes, and (4) Regularly applying sunscreen with a sun protection factor (SPF) of 15 or more. In addition, it is recommended that people avoid tanning beds and sun lamps, which provide an additional source of UV radiation. Contrary to what was previously believed, recent scientific research suggests that although sunscreen is thought to be an important adjunct to other types of UV protection, it should not be expected to provide UV protection by itself (Saraiya, Glanz, & Briss, et al., 2004).

Children and Sun Protection

There has been a great deal of research into the danger of exposure to ultraviolet radiation, and of the risk to children and adolescents of unprotected exposure to the sun. The relative harmfulness of exposure on the early years of life is greater than later in life (Hill & Dixon, 1999). Children receive three times the annual UV-B dose of the average adult and receive a significant proportion of their lifetime sun exposure during this time period (Hebelt, 1993; Truhan, 1991). While previous estimates were that eighty percent

of a person's lifetime sun exposure occurs before the age of twenty-one (Preston & Stern, 1992; Banks et al., 1992), a study conducted in Denmark by Thieden, Philipsen, Sandy-Moller, Heydenrich, & Wulf, (2004) suggested that this estimate is more likely to be closer to twenty percent. However, the precision and generalizability of Thieden et al.'s (2004) findings have been a matter of debate. Stern (2005) argued that Thieden et al.'s (2004) study was conducted among a small sample, and that data from Denmark may not reflect US sun exposure patterns or conditions. Stern's (2005) revised calculation of reduction in lifetime skin cancer risk among children with high levels of sun protection compared with children with low levels of sun protection was 62% (compared with the author's previous estimate of 78%). This calculation is based upon a lower estimate of sun exposure during childhood, which is closer to that proposed by Thieden et al (2004) than to previous estimates. Stern also reiterated that "the greater importance of sun exposure early in life than in adult years for NMSC lifetime risk, particularly basal cancer risk, is supported by epidemiologic studies performed subsequent to our study" citing Gallagher, Hill, & Bajdik, et al. (1995) and Corona et al. (2001).

The risk of developing melanoma is strongly related to a history of one or more sunburns in childhood or adolescence (Westerdahl, Olsson & Ingvar, 1994; Elwood & Jopson, 1997; Armstrong, 1997; Whiteman & Green, 1997). Unprotected time in the sun also puts children at risk for other skin cancers (beside melanoma), cell and tissue damage, photosensitive reactions (rash), painful sunburns, premature (early) skin aging and wrinkling later in life, a weakened immune system, and cataracts later in life (Lew,

Sober, Cook, Marvell, & Fitzpatrick, 1983; Marks, 1994; Cockburn, Hennrikus, Scott et. al., 1989). However, despite numerous federal recommendations for safe sun practices, at least two thirds of US children are not adequately protected from the sun (Geller, Colditz, & Oliveria et al., 2002; Cokkinides, Davis, Weinstock et al., 2001). Although effective measures to reduce sun exposure are known, both casual observation and accumulated research confirm that few people consistently incorporate these measures into their daily behavior (Buller, Callister, & Reichert, 1995). In 1998, the Centers for Disease Control and Prevention conducted a survey with parents of white children aged 6 months to 11 years. They found that children spent a median of 20 hours a week outdoors during the summer. Sunscreen and shade were the most frequently used methods of protection (62% and 26.5%, respectively). They also found that approximately 43% of white children experienced one or more sunburns in the past year (Hall, McDavid, Jorgensen, & Kraft, 2001; Hall, Jorgensen, McDavid, Kraft, & Breslow, 2001).

Influencing children's attitude toward sun exposure needs to begin at an early age (Wesson & Silverberg, 2003). Health behaviors, including unprotected sun exposure are established early in life and may continue into adulthood (Marks, 1988; Arthey & Clarke, 1995; Morris, McGee, & Bandaranayake (1998); Cody & Lee, 1990; Loescher, Buller, & Buller et al., 1995). Banks et al. (1992) found that teenagers who used sunscreen generally had parents who insisted on sunscreen use when those teenagers were children (Banks, Silverman, & Shwartz, et al. 1992).

Learning sun-safe habits early in life is easier than reversing harmful habits later (Hill & Dixon, 1999). Although younger children (prior to grade school) know less than older children, they appear to receive greater encouragement from parents and respond to this positively (Dixon, Borland, & Hill, 1999; Hill & Dixon, 1999). These children can be targeted successfully by parents and physicians. Habitual behaviors are patterns of activity that, through repetition, become relatively fixed, automatic, and easily carried out. They become harder to change and become more dependent on cues or stimuli in the environment with which they have been associated in the past. Thus, if sun protective behavior can be established as a habit in early life, less resistance may be encountered with sun protective behavior than if introduced in adolescence as a new behavior that opposes previously established patterns (Hill & Dixon, 1999).

At a young age, parents are generally recognized to be the most fundamental agents for socialization (Maccoby, 1984) and play a central role in their children's sun protection behaviors. Buller et al. (1995) observed that parents can help protect children from the sun through direct advocacy, incorporation of preventative behavior into family routines and activities, service as role models, and provision of family resources such as sunscreen and protective clothing. Studies have shown significant correlations between parental use of sunscreen and use by their children (Johnson, Davy, Boyett, Weathers, & Roetzheim, 2001). Adult caregivers can encourage children's sun protection by direct (e.g. applying a child's sunscreen for them) or indirect (e.g. providing a child with access to sunscreen) actions (Hill & Dixon, 1999; Bennets, Borland & Swerissen, 1991; Buller,

Callister & Reichert, 1995; Zinman, Schwartz Gordon, Fitzpatrick, & Camfield, 1995). Parental modeling of sun protection behaviors can also influence their children's perception of the importance of this behavior, and the likelihood of the adoption of this behavior by the individual later in life (O'Riordan, Geller, Brooks, Zhang, & Miller, 2003; Lombard, Neubauer, Canfield, & Winett,. 1991).

Some programs for parents have been shown to increase sun protection for their children (Rodrigue, 1996; Bolognia, Berwick, Fine, et al., 1991; Parrott, Dugga, & Cremo, et al., 1999; Glanz, Lew, Song, & Brook, 999; Glanz, Chang, & Song, et al., 1998). Parents appear to respond favorably to appeals to improve sun protection for their children. Two studies by Buller et al. (Buller, Borland, & Burgoon, 1998; Buller, Burgoon, Hall, et al. 2000) evaluated the efficacy of postal mailings to parents of printed materials on sun safety. The authors found that parents who received mailings with printed material with high language intensity reported stronger intentions to engage in sun protection for their children and themselves. Interestingly, the authors also noticed that high intensity messages formatted in a deductive, logical style produced greater increases in sun safety behaviors and behavioral intentions in parents who planned to take more precautions as opposed to parents who had no plans to improve behavior possibly because these types of messages reinforce parent's plans and this format reduces perceived barriers to protecting themselves and their children. In parents with no plans for behavioral modification, inductive messages (a list of facts without discussion)

created greater increases in reported protection behavior and behavioral intentions possibly because they reacted unfavorably to being told to behave in a certain way.

In relation to sun protection behaviors, an evaluation of the EPA's Sunwise school program showed that attitude change as the result of sun protection education was most prominent among younger children aged 5-9, compared with older school-age children (Geller, Rutsch, Kenausis, Selzer, & Zhang, 2003). Other studies have also focused on this age group (O'Riordan, Geller, & Brooks, et al. 2003). The age range was limited to children aged up to 10 due to the fact that, as children develop and move into early adolescence, it becomes more difficult to change underlying attitudes and preventive health behaviors, including sun protection and nutrition. Cross-sectional data indicate that attitudes and behaviors supportive of sun protection decline in the teenage years while positive attitudes toward tanning and perceived attitudes of the peer group toward sun protection take over (Dadlani & Orlow, 2008). Thus, arguably, the most opportune age to influence these behaviors is five up to ten years old. If parents can instill protective habits in children of this age, there is evidence that they are more likely to be carried over into adulthood.

Given the important role that parents play in ensuring that their children are properly protected from exposure to the sun, and in influencing their subsequent behavior as they develop, it is important to investigate ways in which we can design and test theory-based messages that can be shown to increase parental intention to monitor their children's sun protection behaviors on a regular basis.

1.2 Obesity and cancer

Over the past two decades, the prevalence of overweight and obesity has continued to increase in most developed countries (and in urban areas of many less developed countries). Nearly two-thirds of adults in the United States (Flegal, Carroll, Ogden, & Johnson. 2002) and an increasing percentage of the population worldwide (Seidell, 2003) are overweight or obese as defined by the World Health Organization (WHO Expert Committee on Physical Status, 1995). During the same period, the incidence of type-II diabetes has increased as well, and is presumed to be a direct result of, the obesity epidemic (Mokdad, Ford, & Bowman, et al. 2003). Although a great deal of evidence has pointed to the role of obesity as an important cause of diabetes and cardiovascular diseases, the relationship between obesity and different types of cancer has received less attention than its cardiovascular effects (Calle & Kaaks, 2004).

Results from epidemiological studies initially conducted in the 1970's indicate that obesity contributes to the increased incidence and/or death from cancers of the colon, breast (in postmenopausal women), endometrium, kidney, (renal cell), esophagus (adenocarcinoma), stomach (cancer of the cardiac glands of the stomach), pancreas, gallbladder and liver, and possibly other cancers. An estimated 15–20% of all cancer deaths in the United States are argued to be attributable to overweight and obesity (Calle, Rodriguez, Walker-Thurmond, et al., 2003). A substantial proportion of these cancers could be avoided with maintenance of normal weight throughout adult life. In the United States, overweight and obesity underlie 90,000 deaths from cancer per year, and

280,000–325,000 deaths from all causes per year (Alison, Fontaine, Manson, et al., 1999). In the European Union, an estimated 279,000–304,000 annual deaths are attributed to overweight and obesity (Banegas, Lopez-Garcia, Gutierriz-Fisac, et al., 2003). In a study conducted in 2003, attributable medical expenditures in the Unites States for obesity were estimated to be $75 billion in 2003 dollars (Finkelstein, Fiebelkorn, & Wang, 2004). However, recent estimates suggest that the current medical expenditures attributable to obesity have increased in recent years and are estimated to be as high as $147 billion per year (CDC, 2009). One source contends that the impact of overweight and obesity in terms of both mortality and healthcare costs equals or exceeds that associated with tobacco use (Mokdad, Marks, & Stroup, et al., 2004).

Childhood and Prevention of Obesity

Overweight and obesity in children is epidemic in North America and internationally. Approximately 22 million children under 5 years of age are overweight across the world (Deckelbaum & Williams, 2001). In the United States, the number of overweight children and adolescents has doubled in the last two to three decades, and similar doubling rates are being observed worldwide, including in developing countries and regions where an increase in Westernization of behavioral and dietary lifestyles is evident. For example, in Thailand the prevalence of obesity in 5-to-12 year olds children rose from 12.2% to 15.6% in just two years (World Health Organization, 2009).

Comorbidities associated with obesity and overweight are similar in children as in the adult population. Elevated blood pressure, dyslipidemia, and a higher prevalence of factors associated with insulin resistance and type 2 diabetes appear as frequent comorbidities in the overweight and obese pediatric population (Deckelbaum & Williams, 2001). In some populations, type 2 diabetes is now the dominant form of diabetes in children and adolescents. Disturbingly, obesity in childhood, particularly in adolescence, is a key predictor for obesity in adulthood. Moreover, morbidity and mortality in the adult population is increased in individuals who were overweight in adolescence, even if they lose the extra weight during adulthood (Deckelbaum & Williams, 2001).

The studies described here focus on the creation and testing of persuasive messages aimed at increasing parental intention to provide their child/ren with a healthy diet that is low in fat and sugar and includes recommended amounts of fruits and vegetables, an important factor toward reducing the likelihood of obesity and obesity-related cancer later in life. This study focuses on sun protection behaviors, which have also been shown to be significantly associated with a child's risk of developing skin cancer later in life, as discussed above.

Parents of children aged five through age nine were chosen as the focus of this study as this age has been shown to be an important biological and psychological stage at which parent's choices regarding preventive health behaviors can have an important impact on the child's later development. Young children can be taught sun protection and healthy nutrition practices as routinely as they brush their teeth. When a small number of

children possess the correct information within an age group, this is an appropriate time frame to introduce a concept (Hughes, Wetton, Collins, & Newton Bishop, 1996).

Regarding parents' influence on their child's nutritional intake, in early childhood, BMI normally decreases until age 5–6 years, then increases through adolescence. The age at which this BMI nadir occurs has been termed the adiposity rebound (Rolland-Cachera, Deheeger, Bellisle, Sempe, Guillound-Btaille, & Patois, 1984). Several observational studies (Whitaker, Pepe, Wright, Seidel, & Deitz, 1998; Wisemandle, Maynard, Guo, & Siervogel, 2000) have described an increased risk for obesity later in life in individuals who have an early adiposity rebound. A number of studies focusing on nutrition and obesity prevention have also focused on children's nutritional intake from age five and older (Ebbeling, Pawlak, & Ludwig, 2002; Rolls, Engell, & Birch, 2000).

1.3 Theoretical background:

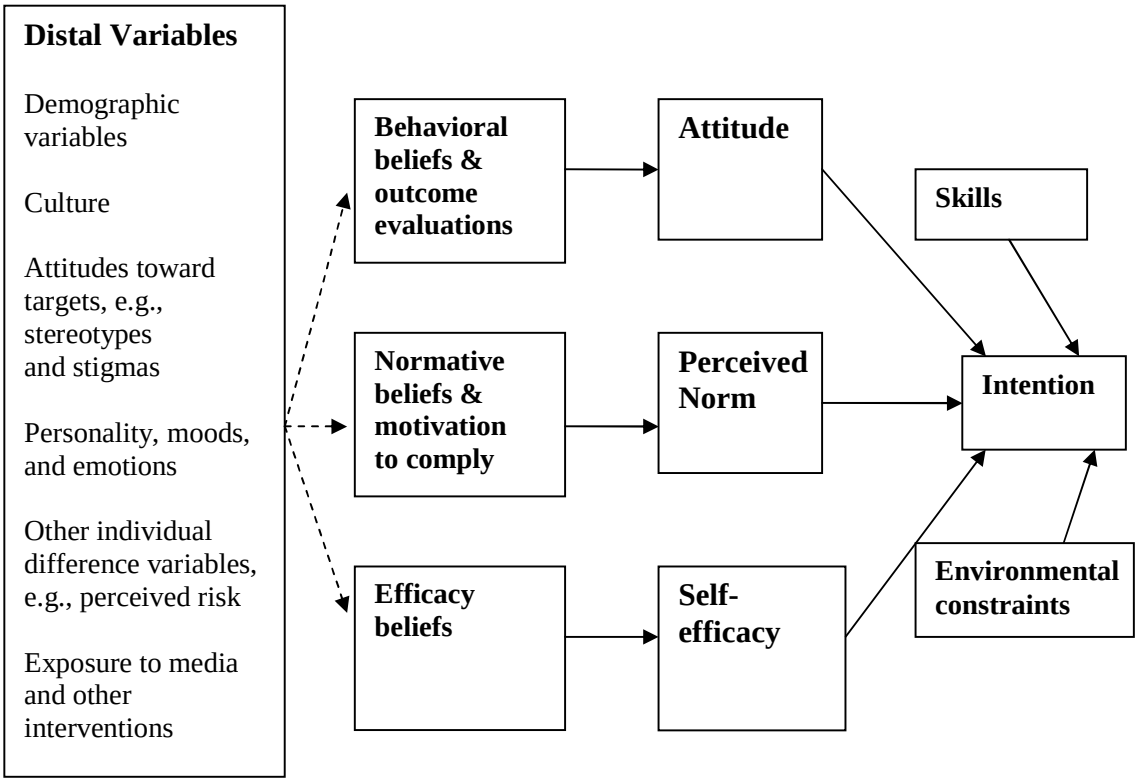
1.3.1 The Integrative Model of Behavior Change

The Integrative Model of Behavior Change (Fishbein, 2000; Fishbein et al., 2002; Fishbein and Ajzen 2010) is an expectancy outcome model of behavior change which has evolved from the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and planned behavior (Ajzen, 1991). In contrast to approaches that attempt to account for human behavior through a variety of demographic variables, personality characteristics, situational factors, as well as domain-specific constructs, the

reasoned action approach argues that a limited set of constructs can be applied to predict and understand any behavior of interest (Fishbein and Ajzen, 2010). The theory of reasoned action approach developed out of Fishbein and Ajzen's proposition that, instead of focusing on one or another global disposition to account for different types of behavior in the disposition's domain of application, we should identify a particular behavior and then look for antecedents that can help to predict and explain it, and thus potentially provide a basis for interventions designed to modify it (Ajzen & Albaraccin, 2007). The Integrative Model, (Fishbein et al., 2000; Fishbein et al., 2002) the current form of this theory, identifies a small set of causal factors that should permit explanation and prediction of most human social behaviors.

The Integrative Model (IM) (Fishbein, 2000; Fishbein et al., 2002; Fishbein and Ajzen 2010) considers behavioral intention to be the most proximal determinants of behavior. The IM focuses on changing beliefs about consequences, normative issues, and efficacy with regard to a particular behavior, as changing beliefs underlying the intention to perform a behavior ultimately results in changes in intention (Fishbein & Yzer, 2003). The IM added the concept of descriptive norms in recognition of the fact that perceived normative pressure can reflect not only what others think we should do but also what they themselves are perceived to be doing. It also incorporated Bandura's notion of self-efficacy rather than Ajzen's more recent concept of perceived behavioral control (Fishbein & Ajzen, 2010).

Figure 1.1 The Integrative model of Behavioral Change (Fishbein, 2000; Fishbein et al., 2002; Fishbein and Ajzen 2010)



According to Fishbein & Ajzen (2010), no matter how beliefs associated with a given behavior are acquired, they serve to guide the decision to perform or not perform the behavior in question. Specifically, three kinds of beliefs are distinguished. First, people hold beliefs about the positive or negative consequences they might experience if they performed the behavior. These outcome expectancies or *behavioral beliefs* are assumed to determine people's *attitude toward personally performing the behavior*, i.e., their positive or negative evaluation of their performing the behavior in question. In

general, to the extent that their performance of the behavior is perceived to result in more positive than negative outcomes, the attitude toward the behavior will be favorable (Fishbein & Ajzen, 2010).

Second, people form beliefs that important individuals or groups in their lives would approve or disapprove of their performing the behavior, as well as beliefs that these referents themselves perform or don't perform the behavior in question. In their totality, these *injunctive and descriptive normative beliefs* produce a *perceived norm*, i.e., perceived social pressure to engage or not engage in the behavior. If more important others are believed to approve than disapprove, and if the majority of important others perform the behavior, people are likely to perceive social pressure to engage in the behavior. Finally, people also form beliefs about personal and environmental factors that can help or impede their attempts to carry out the behavior. In their aggregate, these *control beliefs* result in a sense of high or low self-efficacy (Bandura, 1986, 1997) with regard to the behavior. If control beliefs identify more facilitating than inhibiting factors, perceived self-efficacy with regard to the behavior should be high (Fishbein & Ajzen, 2010).

It should be noted that application of the reasoned action approach typically requires the elicitation of specific beliefs that are significantly associated with overall attitude, perceived normative pressure and self-efficacy beliefs. However, the studies described here look at the more general measures of these constructs. From a practical standpoint it would have been difficult to include a list of salient beliefs for all of the

specific behaviors within each behavioral category (i.e. five sun protection behaviors and a wide range of nutrition-related behaviors) within the framework of this study. This would have significantly increased the demands imposed on subjects and would have consequently limited the breadth of hypotheses that could be tested.

Additionally, one benefit of examining general measures of attitudes, norms and self-efficacy beliefs is that the implications of this study may be more useful for researchers looking at sun protection behaviors and nutrition-related behaviors. The findings of this study, it was hoped, would help illustrate the extent to which the general measures of attitudes and normative pressure vary across sub-groups and behaviors and whether a message matched to these general measures could influence the relative weight of these beliefs. Future research should focus more narrowly on a particular behavior of interest, and conduct an elicitation study to look at the effects of messages aimed at priming or changing specific salient beliefs underlying the construct that is most strongly associated with intention.

1.3.2 Injunctive norms and health behaviors

In "*Communication and normative influence*: *An introduction to the special issue*", Yanovitzky and Rimal (2006) argue that social norms exert a great deal of influence on human behavior, but that much research needs to be done in specifying the mechanisms and processes through which normative influence is exerted. Research into normative influence has typically reflected a tension between the social (relational) and individual

(cognitive) conceptualization of normative influence and in the tendency to distinguish between collective and perceived norms (Lapkinski & Rimal, 2005) as well as injunctive and descriptive norms (Cialdini, Reno, & Kallgren, 1990); two types of motivations that can explain the effects of norms on people, the desire to avoid sanctions and the need for self-validation (Bendor & Swisttak, 2001); two conceptually distinct processes of influence, normative and information influence (Deutsch & Gerard, 1955; Kitayama & Burnstein, 1994); and two sets of potential influence outcomes, public compliance and private acceptance (Cialdini & Goldstein, 2004; Kelman, 1958).

A social norm is a generally accepted way of thinking, feeling or behaving that is endorsed and expected because it is perceived as the right and proper thing to do. Generally speaking, social norms refer to what is acceptable or permissible behavior in a group or society (Fishbein, 2010). A social norm is a rule, value or standard shared by the members of a social group that prescribes appropriate, expected or desirable attitudes and conduct in matters relevant to the group (Turner, 1991). Social norms vary in how important they are to the group and in the intensity of social approval and rejection that conformity and non-conformity attract. Group members who conform to norms tend to be socially approved of, whereas those who deviate tend to be disapproved of, and in the extreme may be punished and excluded from the group (Turner, 1991). The idea of a norm conveys a feeling of ‘oughtness’ about certain behaviors; there is an element of moral obligation, duty, justice. Mothers are not just expected to love and care for their children as a preference - we feel that they ought to and, if they don’t, they are failing in

their duty as mothers and indeed as human beings. Social norms express social values and normative judgments are value judgments. In this sense they are "external to the individual, being the property of a culture, and constrain the actions of the individuals" (Turner, 1991, p. 3). Social norms are "descriptive, reflecting actual similarities, and prescriptive, reflecting shared beliefs about appropriate, valued conduct" (Turner, 1991). If a social norm is a shared belief that a certain course of action is appropriate in a given situation, then, when individuals act in line with the norm, they experience their behavior as subjectively valid (Turner, 1991, p 4). In a reasoned action framework, norms are more narrowly defined and are focused on the performance of a particular behavior. That is, norms (descriptive and injunctive) are viewed as perceived social pressure to perform (or not to perform) a given behavior (Fishbein & Ajzen, 2010). It is assumed that perceived social pressure can influence behavior even when no rewards or punishments are anticipated (Fishbein & Ajzen, 2010).

Injunctive Norms and Health Behaviors

In the health domain injunctive norms appear to play a particularly important role with regard to intention to perform healthful behaviors (Finlay, Traffimow, & Villareal, 2002). Terry and Hogg (1996) proposed that injunctive norms may be especially important in predicting health-related behaviors because, for these types of behaviors, people tend to be confident of what they believe their most important others think, which may not be as true of other types of behaviors. The importance of injunctive norms has

also been directly applied in community interventions. Specifically Fishbein and his colleagues (Fishbein, Trafimow, Francis et al., 1993; Fishbein, Trafimow, Middlestadt et al., 1995) demonstrated the importance of injunctive norms in predicting and determining condom use.

However, there appear to be differences between descriptive and injunctive norms with regard the norm-intention association. Cialdini et al. (1990) stressed the need to differentiate between descriptive norms (what is perceived as commonly done) and injunctive norms (what is perceived as commonly approved and disapproved). The authors stressed the need to differentiate between these constructs because each refers to a separate source of human motivation (Deutsch & Gerard, 1955; Kaplan, 1989). Subsequent research supported this distinction between these constructs by demonstrating that the two types of norms led to significantly different behavior patterns in the same setting (Reno, Cialdini, & Kallgren, 1993).

Cialdini et al. (1990) contended that a particular social norm – of either the descriptive or injunctive variety – is unlikely to influence behavior unless it is focal (i.e. salient) for an individual at the time of behavior. Cialdini et al. (1991) and Reno et al. (1993) argued that when the relevant norm is injunctive rather than descriptive, norm-focus procedures can be useful in producing desirable behavior. This is because focal injunctive norms have been shown to stimulate prosocial conduct across a wider range of settings and circumstances than descriptive norms (e.g. Reno et al. 1993). Kallgren, Reno and Cialdini (2000) conducted a series of experiments to manipulate normative

focus in its effects on the generation of socially desirable conduct as well as examine factors that might alter the relationship between norm focus and behavior. The findings of this study supported the argument for the viability of injunctive norms as powerful behavior directives. In all three experiments, the impact of normative precepts on participants' littering decisions was considerable (pg. 1010).

Terry and Hogg (2001) argue that the norms of a group that are relevant to the behavior will influence behavior, but that the extent to which the group membership is a salient base for self-definition also needs to be taken into account. The descriptive norm-intention relationship has been shown to be moderated by the extent to which people identify strongly with the relevant referent group. In a study by Terry and Hogg (1996), the perceived norms of the reference group of friends and peers were found to influence intentions to engage in regular exercise and sun-protective behavior, but only for those who identified strongly with the group, a pattern of results that was replicated in a study of community residents' recycling behavior (Terry, Hogg, & White, 1999).

1.4 The effect of the observability of behavior and social norms on intention

The current study focuses on the effects of manipulation of the *context* of the health behaviors in question on the association between norms and intention, specifically the degree to which the behavior is enacted in a private or public setting. The study builds upon research that has found that the extent to which a behavior is enacted in a public or private setting has been shown to moderate normative influences (Bagozzi et al.,

2000; Cialdini et al, 1990). For behaviors performed in public, pressures to conform, that is, engage in behaviors perceived to be acceptable in others' eyes, are likely to be substantial. This is because a privately performed behavior is not observable for others' scrutiny and people are less likely to engage in the interrogation of others (Berger & Calabrese, 1975) about largely private behaviors. For publicly performed behaviors in which referent others can observe others' behaviors, either directly or indirectly, social sanctions can be exercised for violating injunctive norms (Lapinski & Rimal, 2005).

The idea that conformity to the group will be greater under public than private conditions, when the group members can observe and identify any deviation, is central to the process of normative influence (Turner, 1991, p. 44). Deutch and Gerard (1955) tested the effect of observability of behavior on conformity to group influence, and found that, in line with the concept of normative influence, subjects showed less conformity to the group in the anonymous (private) then in the face-to-face (public) setting. Allen (1965) has argued that more conformity in public than in private need not always indicate a mere public compliance effect: "in the more public situation the group may be regarded as more convincing, so that actual private change as well as public compliance could be greater in the public than in the private conditions" (p. 146).

The studies described here test whether the extent to which the same health behavior is enacted in an observable or non-observable setting leads to variation in normative influence on intention among parents. This process of persuasive change is known as priming, and is based on priming theory, which proposes that persuasive effects

can also occur by changing the association between a predictor and its outcome, even when the mean for the predictor remains the same (e.g. Domke, Shah, & Wackman, 1998; Iyengar & Kinder, 1987; Mendelsohn, 1996). Priming's theoretical basis is based on activation and accessibility. Priming increases the association between the primed belief and the subsequent attitude. Priming should increase the relative importance of the primed belief in the overall positive or negative evaluation of the behavior and intention to perform that behavior (Fishbein & Cappella, 2006). There is evidence that priming has occurred when there is an increase in the correlation between the primed variable and the outcome variable (e.g., the primed belief and attitude or the primed attitude and intention) (Fishbein & Cappella, 2006).

It is expected, based on research reviewed here, that the presence of referent others (i.e. others parents) will prime descriptive and injunctive norms associated with sun protection and nutrition behaviors among parents of young children. Consequently, among parents who are told that their behavior can be observed by another parent, there should be a greater influence of perceived norms on intention. Under conditions of observability by other parents of young children, parents will attend more to normative influences than when they are not in the presence of other parent.

That intention to perform preventive health behaviors will vary as a function of observability and perceived norms.

Hypothesis 1A: Intention to perform health behaviors for one's child should be more associated with descriptive norms among parents who are told that their behavior is observable by other parents (vs. not observable).

Hypothesis 1B: Intention to perform health behaviors for one's child) should be more associated with injunctive norms among parents who are told that their behavior is observable by other parents (vs. not observable) .

1.5 Priming normative influence through observability

Deutch and Gerard's (1955) theory of informational and normative social influence is an attempt to distinguish two process underlying social conformity and their distinctive antecedent conditions. Normative influence is defined as social influence that is based on an individual's need for social approval and acceptance (Miniard & Cohen, 1981; Ryan, 1982). Turner defines normative influence as "socially motivated by a desire for acceptance and approval and to avoid rejection and hostility" (Turner, 1991, p. 37). In contrast, Baumister (1982, p. 9) contends that public conformity as a result of normative influence is "born out of concern with maintaining a desirable public image for oneself rather than out of specific fear or threat of punishment". In the context of the performance of health behaviors for the benefit of one's child, the second interpretation appears to be more applicable – parents are more likely to be motivated to conform to the

normative influence of other parents (under conditions of surveillance) out of a desire to maintain a positive public image rather than out of fear of overt rejection or hostility.

Deutch and Gerard (1955) consider normative influence as "the type of social influence most specifically associated with groups" (p. 635), and hypothesize that it is increased by group belongingness and social interdependence, surveillance of one's response by others and social pressure, and reduced by public and private commitment to some other prior course of action producing countervailing expectations in others and oneself (Turner, 1991, p. 35). The causal process of normative influence is as follows (p. 38):

1. The power of others to reward or punish (e.g. to accept into or reject from the group) creates a need for their social approval and a fear of being different.
2. Therefore, under conditions of surveillance by others such that one can be personally identified and held responsible for any nonconformity,
3. One will tend to comply with the expectations or submit to other group pressures, producing conformity to the group norm.

Informational influence, on the other hand, occurs when people internalize and privately accept information from others because the information provides a basis for correct perceptions, attitudes, and beliefs (Asch, 1952; Deutsch & Gerard, 1955; Kelley, 1952). Fishbein and Ajzen's (1975) Theory of Reasoned Action implies a social influence process whereby people bring their behavior into line with the behavioral expectations of important others. Terry, Hogg, & Duck (1999) argue that the underlying

social influence process can be categorized as normative influence - as it is public compliance arising from a need for social approval and acceptance.

Observability of behavior and the effect of injunctive norms on behavioral intention

There is a great deal of support showing that both behavior type as well as individual dispositions can have important effects on the relative weights of attitudes and injunctive norms (see Trafimow & Finlay, 1996). A wide range of other studies have shown that the relative ability of attitudes versus injunctive norms to predict behavioral intention varies widely across behaviors (e.g. Finlay, Trafimow, & Jones, 1997; Finlay, Trafimow, & Moroi, 1999). The current study focuses on the effects of manipulation of the *context* of the health behaviors in question, specifically the degree to which the behavior is enacted in a private or public setting.

The extent to which a behavior is enacted in a public or private setting has been shown to moderate normative influences (Bagozzi et al., 2000; Cialdini et al, 1990). For behaviors performed in public, pressures to conform, that is, engage in behaviors perceived to be acceptable in others' eyes, are likely to be substantial. This is because a privately performed behavior is not observable for others' scrutiny and people are less likely to engage in the interrogation of others (Berger & Calabrese, 1975) about largely private behaviors. For publicly performed behaviors in which referent others can observe others' behaviors, either directly or indirectly, social sanctions can be exercised for violating injunctive norms (Lapinski & Rimal, 2005).

The idea that conformity to the group will be greater under public than private conditions, when the group members can observe and identify any deviation, is central to the process of normative influence (Turner, 1991, p. 44). Deutch and Gerard (1955) tested the effect of observability of behavior on conformity to group influence, and found that, in line with the concept of normative influence, subjects showed less conformity to the group in the anonymous (private) then in the face-to-face (public) setting. Allen (1965) has argued that more conformity in public than in private need not always indicate a mere public compliance effect: "in the more public situation the group may be regarded as more convincing, so that actual private change as well as public compliance could be greater in the public than in the private conditions" (p. 146).

The studies described here test whether the extent to which the same health behavior is enacted in an observable or non-observable setting leads to variation in normative influence on intention among parents. It is expected, based on research reviewed here, that parents will report greater intention to perform health behaviors for their child in a setting in which they are told they are in the company of referent others (i.e. other parents), which should increase the extent to which injunctive norms influence intention.

While research has compared the public or private context of different behaviors in relation to the influence of injunctive and descriptive norms on behavior (see Lapkinski & Rimal, 2005 for a review), to date no study has manipulated this context factor to test its effect on the influence of injunctive norms on intention to perform health

behaviors. It is hypothesized, based on research reviewed above, that the effect of priming observability of the behavioral setting will lead to greater intention to perform health behaviors when the message type is normative (i.e. describes normative pressure), compared with when the message type is attitudinal (i.e. describes health outcomes).

H2: Parents of young children exposed to a normative (vs. attitudinal) message should report greater intention to perform health behaviors when the behavior is observable (i.e. has a normative context) than when it is not observable (i.e. non-normative context).

1.6 Priming theory: Priming public self and the norm-intention relationship

Ybarra and Traffimow (1998) tested the hypothesis that the accessibility of the private self and the collective self affects the relative weights given to attitudes and injunctive norms when forming a behavioral intention. They conducted a series of experiments in which they primed the private self, causing subjects to place greater weight on attitudes than injunctive norms and primed the collective self, which caused subjects to place greater weight on injunctive norms than on attitudes. Their conceptualization of private and public self is based on research by Triandis (1989) and others (see Greenwald & Pratkanis, 1984; Markus & Kitayama, 1991), which suggests that private self cognitions reflect an assessment of the self by the self, whereas collective-self cognitions derive from an assessment of the self by a specific reference

group or collective. Triandis (1989) has argued that when people sample cognitions from the private self, they are more likely to be influenced by personal goals and needs. In contrast, when people sample from the collective self, they are more likely to be influenced by the norms and values of the particular collective and behave in a manner considered appropriate by members of that collective (Ybarra & Traffimow, 1998). Ybarra & Traffimow (1998) found that, as hypothesized, when the private self was made more accessible in memory, people's attitudes toward the behavior (or the basis of those attitudes) became more accessible, which allowed attitudes to have a greater impact than injunctive norms in forming a behavioral intention. However, when the collective self was made more accessible, people's injunctive norms (or the basis of those norms) increased in accessibility, allowing them to have a greater impact than attitudes on a behavioral intention (p. 364).

Ybarra and Traffimow's (1998) study is an important foundation upon which the current study aims to build. In that study the authors chose to prime collective and private self in several ways. The first attempt lacked subtlety (subjects were told to think about what makes them different from family and friends / what they have in common with family and friends for two minutes prior to asking about intention) and was revised. Subsequent priming manipulations involved having participants read a short passage about "Sostoras", an ancient Sumerian warrior, and having them imagine they were that character while reading a passage attributing his success to himself, or to his family. While Ybarra and Traffimow (1998) found support for their hypotheses (see above), the

studies described here employs priming theory in an alternative way to prime norms and attitudes associated with intention to perform health behaviors.

Priming injunctive norms and attitudes

While stable individual level variables have been shown to affect the extent to which people grant weight to attitudes or norms in forming intention, few studies have tried to manipulate this outcome. One can prime a belief even though most members of a population already hold the belief because minor changes in weight given to the already positive beliefs can produce strong intention effects (Fishbein & Yzer, 2003). Recent research also indicates that attitudes and injunctive norms can be manipulated independently of each other. Trafimow and Fishbein (1994a) identified, on the basis of previously obtained beta-weights, behaviors that were under either attitudinal control (AC) or normative control (NC). They subsequently manipulated attitudes toward these behaviors and found that the manipulation affected intention to perform AC more than NC behaviors. In later studies (Trafimow & Fishbein, 1994b), they obtained analogous effects when they manipulated injunctive norms.

This research finding has important implications for campaigns promoting health behaviors. Typically, interventions have been focused on changing mean levels of attitudes, injunctive norms, or both (Ajzen, 1971; Middlestadt, Fishbein, & Albaraccin, et al. 1995; Trafimow & Fishbein, 1994a, 1994b). Unfortunately, specific attitudes and injunctive norms may be difficult to manipulate (see Eagly & Chaiken, 1993 for a

review). However, messages directed at priming – i.e. increasing the importance of the underlying norms or attitudes associated with intention to perform health behaviors should increase their likelihood of being performed.

The reasoned action approach has guided many interventions in which attempts are made to induce favorable attitudes, norms, and/or perceived control with respect to a health related behavior (Ajzen & Albaraccin, 2007). One strategy attempts to modify attitudes by using *attitudinal arguments* – which consist of assertions that a particular health behavior has "personally beneficial consequences for one's physical health or psychological comfort" (p. 13). Another strategy uses arguments intended to increase favorable norms with respect to the behavior (*normative arguments*). These arguments are often designed to convince an audience that its social network supports the behavior in question.

The study described here tests the effect of normative compared with attitudinal arguments on the relative weight given to attitudes and injunctive norms in forming intention to perform preventive health behaviors among parents of young children. Based on research reviewed above it is hypothesized that intention to perform health behaviors will be more heavily influenced by injunctive norms among parents who are exposed to a message (relating to the need to perform preventive health behaviors for their child) that has a normative focus (i.e. stresses injunctive norms). In contrast, among parents exposed to a message that has an attitudinal focus (i.e. stresses health benefits of the behavior) it is expected that there will be a stronger association between attitudes and

intention to perform health behaviors than among parents exposed to a normatively focused message or no message.

H3a: Parents exposed to a normative message (vs. attitudinal message or no message) will have a greater association between injunctive norms and intention to perform health behaviors for their child than the association between injunctive norms and intention among other parents.

H3b: Parents exposed to an attitudinal message (vs. normative message or no message) will have a greater association between attitudes and intention to perform health behaviors for their child than the association between attitudes and intention among other parents.

1.7 Identity salience as a moderator of the normative route to intention

Social identity theorists have used the term salience to indicate the activation of an identity in a situation. A salient social identity was defined as "one which is functioning psychologically to increase the influence of one's membership in that group on perception and behavior" (Oakes, 1987, p. 118). In identity theory, salience has been understood as the probability that an identity will be activated in a situation (Stryker, 1980). In social identity theory, salience pertains to the situational activation of an identity at a particular level. A particular identity becomes activated or salient as a

function of the interaction between the characteristics of the perceiver (accessibility) and of the situation (fit) (Stets & Burke, 2000, p. 231). Abrams (1992, 1994) argues that when a social identity is salient (activated) and attended to, responses are deliberate and self-regulated. Group members act to match their behavior to the standards relevant to the social identity, so as to confirm and enhance their social identification with the group. A reference group is one that is psychologically significant for one's attitudes and behavior (Turner, 1991, p. 5). Positive reference groups, a group that one privately accepts or identifies with, exert influence over their members, which usually leads to private acceptance (p. 6).

Social identity and the injunctive norm – intention relationship

According to social identity theory (Tajfel & Turner, 1979; Turner, 1982), an important component of the self-concept is derived from memberships in social groups and social categories. In social identity theory, a social identity is a person's knowledge that he or she belongs to a social category or group (Hogg & Abrams, 1988). A social group is a set of individuals who hold a common social identification or view themselves as members of the same social category (Stets & Burke, 2000, p. 225). In identity theory, the core of an identity is the categorization of the self as an occupant of a role, and the incorporation, into the self, of the meanings and expectations associated with that role and its performance (Burke & Tully, 1977; Thoits, 1983). These expectations and meanings form a set of standards that guide behavior (Burke, 1991; Burke & Reitzes,

1981). Role identity theorists have focused on the match between the individual meanings of occupying a particular role and the behaviors that a person enacts in that role while interacting with others (Burke, 1980; Burke & Reitzes, 1981). In the context of this study, the social identity of parents of young children should reflect their (actual and perceived) role as parent, and the expectations associated with that role, within the social category of parents of young children. These expectations, when made salient through exposure to a message telling parents that they should perform health behaviors for their child because parents like themselves expect them to do so (i.e. a normative message type), should guide perceptions of behavior associated with the role of parent, specifically the role of caretaker and person responsible for the health of their child.

When people define and evaluate themselves in terms of a self-inclusive social category, the joint processes of categorization and self-enhancement come into play. Tajfel (1981) suggested that the desire to develop and maintain a favorable self-image motivates people. The self-image includes both a personal self, which reflects idiosyncratic aspects of the self, and a social self, which reflects information about the groups to which people belong (Tyler, Kramer, & John, 1999). Social-categorization theory is an extension of social identity theory that develops the discussion of the nature of the self-concept contained in social identity theory (Turner, 1982, 1984, 1985; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). However, while the two theories are similar, they have different bases of identity: *categories* or *groups* for social identity theory, and *roles* for identity theory (Stets & Burke, 2000).

Self-categorization is seen as a dynamic, context-dependent process, determined by comparative relations in a given context (Turner & Onorato, 1999). The central hypothesis is that group behavior can be understood as individuals acting in terms of a shared identity than as different individual persons (i.e. more in terms of their personal identities). It seeks to explain variations in how people define and categorize themselves and the effects of such variations (Turner, 1991, p. 157). Which self-category is salient at any particular time is situation-specific; it is a function of people being ready to use a specific category (its accessibility relative to other categories) and its fit with the stimulus data (Oakes, 1987). Any particular self-concept (of those belonging to a given individual) tends to become salient as a function of an interaction between the characteristics of the perceiver and the situation (Bruner, 1957; Oakes, 1983).

One important factor affecting people's readiness to use a social category for self-definition in specific situations is the extent of their identification with the group, the degree to which it is central, valued, and ego involving (e.g. Doosje & Ellemers, 1997). That is to say that, on the basis of a social identity/self-categorization approach, it can be proposed explicitly that behavioral outcomes are influenced by reference group norms, but only for those people for whom the group membership is a salient basis for self-definition (Terry, Hogg, & Duck, 1999). Terry, Hogg and Duck (1999) found that, in line with predictions derived from social identity/self-categorization theories, the perceived norms of a specific and behaviorally relevant reference group were related to students' intentions to engage in health behaviors (regular exercise and sun-protective

behavior), but only for students who identified strongly with the group (Terry & Hogg, 1996).

The studies described here employ a measure of group identification with other parents of young children (i.e. perceived group identification) which is based on a scale used by Terry, Hogg & Duck (1999), Hogg, Cooper-Shaw, & Holzworth (1993), and by Brown, Condor, Mathews, Wade, & Williams (1986). The original scale was designed to assess strength of identification with the reference group (e.g. the extent to which being a psychology student or a university student was a relatively more enduring component of subjects' self concepts). For its use in this study the items are adjusted to assess strength of identification with other parents of young children (see measures).

On the basis of this research it is hypothesized that parents who identify more strongly with other parents of young children should be more responsive to a message which focuses on normative influence by a relevant reference group – other parents of young children like themselves. For parents who identify less strongly with this reference group, exposure to a normative message (i.e. normative focus) compared with an attitudinal message (i.e. health outcome focus) should not cause them to grant greater weight to injunctive-norms in forming intention to perform health behaviors for their child then to attitudes. However, among parents who identify strongly with other parents of young children, exposure to a normative message should lead them to grant greater weight to injunctive norms in forming intention than to attitudes.

H4: Parents of young children who identity more strongly with other parents should report higher intention to perform health behaviors when exposed to a normative message type compared with an attitudinal message (i.e. focuses on health benefits for the child) than parents who identify less strongly with other parents.

1.8 Background factors in the Integrative Model

Research over the past 40 years has provided scant evidence to suggest that either demographic characteristics or general personality traits account for much variance in any particular behavior (Ajzen & Albaraccin, 2007; Fishbein & Ajzen, 2010). Although broad dispositions, such as personality traits and general attitudes can explain broad patterns or aggregates of behavior, they are generally very poor predictors of the specific actions that are investigated in different domains (Ajzen, 2005; Epstein, 1979; Fishbein & Ajzen, 1974; Weigel & Newman, 1976). However, the theory of planned behavior and the Integrative Model of Behavior Change do not deny the importance of global dispositions, demographic factors, or other kinds of variables often considered in social psychology and related disciplines. Identification of relevant background factors can complement the reasoned action / Integrative model by extending our understanding of the behavior's determinants, including the influence of such background variables *indirectly* through their influence on behavioral, normative and control beliefs (see Petraitis, Flay, & Miller, 1995).

In the reasoned action / Integrative model approach, background factors such as gender, ethnicity and past behavior can influence intention and behavior in two ways. First, the relative influence of attitudes, norms, and perceived control on intentions and behavior may vary as a function of a given background factor (Ajzen & Albaraccin, 2007). Second, background factors can influence intentions and behavior by their effects on the proximal determinants, that is, beliefs, attitudes, injunctive norms, and self-efficacy (p. 15).

Empirical research within the reasoned action framework has shown that demographic characteristics such as age, gender, and ethnicity tend to influence intentions and behavior indirectly (Fishbein, 2010). In some studies background factors have been shown to moderate the influence of attitudes, norms and self-efficacy on intention (see review by Durantini, Albarracín, Mitchell, Earl, & Gillette, 2006). Specifically, the beneficial impact of having a message attributed to an expert source was shown to be stronger for ethnic minorities and women than for ethnic majorities and men. Whether normative arguments are effective has also been shown to be contingent on the nature of the audience. For teens, receiving an HIV-prevention message containing normative arguments was found to be better than not receiving these arguments. For adults, receiving normative arguments was worse than not receiving them at all (see Albaraccin et al., 2005).

Fishbein & Ajzen. (2010) note that given the vast number of potentially relevant background factors, such as general attitudinal and personality dispositions as well as

demographic characteristics, it is difficult to know which ones should be considered without a theory to guide selection in the behavioral domain of interest. Theories of this kind are not part of the model's conceptual framework but can complement the IM by identifying relevant background factors and thereby deepening our understanding of a behavior's determinants (see Petraitis, Flay, & Miller, 1995).

1.8.1 Other-directedness as a moderator of the normative route to intention

One of the objectives of this study is to test the hypothesis that particular personality traits will interact with norms and attitudes in their effect on intention. In particular, this study explores individual differences that make some parents more vulnerable to normative messages (specifically with regard to health behaviors). The construct of interest is tendency to be influenced by others versus self - when individuals who have a greater tendency to be influenced by others are expected to be more vulnerable to the effect of normative message on intention than parents who are more influenced by their own beliefs when forming intentions. I considered a variety of theoretical approaches to capturing this idea. Below is a review of the relevant literature.

Individual Differences and the Attitude-Intention and Injunctive norm-Intention Relationship

Recently, several researchers have begun to test individual level variables that might moderate participants' weighting of attitudes or (injunctive) norms in determining intentions. Fishbein & Ajzen (2010) suggests that it may be possible to make predictions about the relative contribution of attitudes, perceived norms and self-efficacy toward predicting intentions based on theories relevant to the behavior of interest. It has sometimes been suggested that attitudes will be more important than perceived norms for individuals low as opposed to high in self-monitoring tendency (see Ajzen, Timko, &White, 1982) and the same pattern has also been predicted for comparisons of individualistic versus collectivistic cultures (Ybarra & Trafimow, 1998).

Other evidence also suggests that the relative effects of attitudes and injunctive norms on intentions vary with personal characteristics. For example, a study by Arie, Durand, and Bearden (1979) showed that people's intention to patronize credit unions were either under attitudinal or normative control depending on whether the person was an opinion leader or not. The intentions of opinion leaders were under attitudinal control, whereas those of others were under normative control. Bagozzi, Baumgartner, and Yi (1992) found a greater attitude-intention correlation than a injunctive norm-intention correlation for action-oriented people but the reverse was true for state-oriented people. State orientation refers to a low capacity for the enactment of action-related mental structures, whereas action orientation refers to a high capacity for this type of enactment

(e.g. Kuhl, 1984, 1986). Bearden and Rose (1990) showed that attention-to-social-comparison information, a construct proposed by Lennox and Wolfe (1984) as an alternative to Snyder's (1974) self-monitoring scale, moderated the relative impact of personal and normative considerations on intentions. Similarly, Saltzer (1978) found that, for subjects with high outcome values for behavioral intention toward losing weight locus of control influenced whether intentions were a function of attitudinal or normative factors.

Trafimow and Finlay (1996) performed within-participants analyses across a variety of behaviors and demonstrated that people, as well as behaviors, can be under attitudinal or normative control. The importance of social influence depends not only upon the type of behavior (for example, whether it is primarily a "private" or a "public" behavior) but also upon the type of person (e.g. whether their intentions are primarily under "attitudinal" control (AC) or "normative control" (NC) (Trafimow & Finlay, 1996). If a person's within-subject attitude-intention correlation is larger than the injunctive-norm-intention correlation, he or she would be considered to be generally under attitudinal control (AC). If the reverse were true, the person would be considered to be generally under normative control (NC) (Trafimow & Finlay, 1996).

This individual difference research indicates that depending on personal characteristics, people rely on one or the other element to a greater extent when forming behavioral intentions across a variety of behaviors. While Finlay et al.'s (1999) NC/AC distinction might be a useful measure to differentiate the degree to which individuals are

driven by injunctive norms or by attitudes, its application to the current study would be problematic. The method used by Trafimow and Finlay to classify individuals as NC or AC is costly and requires a wide range of outcome behaviors and subjects. It is also yet to be validated or tested widely and so, while relevant to the review of literature pertaining to this study, would not be an efficient measure for a dispositional trait in this study.

In contrast to Trafimow and Finlay's (1996)'s reliance on within-subject analyses across behaviors, most investigators measure a given individual difference variable and examine the extent to which it moderates the effects of attitudes, perceived norms and self-efficacy on intention to perform a given behavior. In one such study, Latimer and Martin Ginis (2005) found that a generalized fear of negative evaluation moderated the association between injunctive norms and exercise intentions, when this association was shown to be significant only among subjects with a high fear level of negative evaluation. Kallgren, Reno and Cialdini (2000) suggest that, (in addition to situational factors) dispositional factors may affect norm focus. They propose that degree to which an individual focuses naturally externally or internally might affect the extent to which norms guide their behavior. However, they do not test whether dispositional factors do, in fact, influence the degree to which making norms focal will increase the norm-intention association.

Having considered the approaches described above (taking into account their methodological limitations as well their relevance to the focus of this study), a decision

was made to focus on two dispositional traits that were considered to best capture the idea of vulnerability to normative influence and other- versus inner-directedness, and have been widely tested and validated. These dispositional traits are self-monitoring (Snyder, 1974) and private self-consciousness (Fenigstein, Scheier, & Buss, 1975). The Self-Monitoring Scale measures how likely people are to modify their behavior in different situations in order to be consistent with the opinions of others (Snyder, 1974). Individuals high in self-monitoring tendency are assumed to be "highly sensitive to social and interpersonal cues of situationally appropriate performances" whereas individuals low in this tendency are thought to "display expressive behavior that truly reflects their own attitudes, traits, feelings, and other current inner states" (Gangestad & Snyder, 1985, p. 322). People who are low as compared to high on this scale have been shown to be more likely to exhibit attitude-behavior correspondence in a variety of settings (Ajzen, Timko, & White, 1982; Snyder & Kendzierski, 1982; Zanna, Olson, & Fazio, 1980). Perceived norms, according to this conception of self-monitoring, should be more important factors for people high rather than low in self-monitoring tendency whereas attitudes should be more important factors for people who are low rather than high in self-monitoring (Fishbein & Ajzen, 2010).

The studies described here use 11 items from the full (25-item) scale, which were shown to form one factor, labeled as Other-Directedness by Briggs, Cheek, and Buss (1980) in their factor analysis of the Self-Monitoring Scale (see Appendix for scale items). Briggs, Cheek, and Buss (1980) argue that research using this scale should

distinguish between scores for each of three factors (Acting, Extraversion, and Other-Directedness) rather than use full scale scores. The items that form the Other-directedness subscale emphasize pleasing others, conforming to the social situation, and masking one's true feelings. Although these tendencies are diverse, Briggs, Cheek, and Buss (1980) note that they all concern an orientation toward others, and were also shown to form an internally consistent subscale with an alpha coefficient of 0.70 and 0.72 across two samples in the study.

The Self-Consciousness scale (Fenigstein, Scheier, & Buss, 1975) is a 23-item questionnaire which measures individual differences in private and public self-consciousness. The scale includes measures of private and public self-consciousness as well as a measure of social anxiety. Theoretically, the Private Self-Consciousness Scale measures how aware people are of their own attitudes, motives, and feelings (Fenigstein, Scheier, & Buss, 1975). Empirically, people who are high as compared to low on this scale have been shown to exhibit greater consistency in attitudes expressed across different situations (Scheier, 1980) and greater correspondence between attitudes and behaviors manifested within particular situations (Carver & Scheier, 1981; Davis, Holtgraves, Kasmer, & Ginsburg, 1982). The term private self-consciousness refers to the tendency to think about and attend to the more covert, hidden aspects of the self, aspects that are personal in nature and not easily accessible to the scrutiny of other people – for example, one's privately held beliefs, aspirations, values and feelings (Scheier & Carver, 1985). Scheier and Carber (1985) revised the Self-Consciousness scale to adapt

it for use among non-college populations in light of research suggesting that the wording of the original scale may have been difficult for non-college student populations to understand. This study uses the revised scale, which is appropriate for the older population of parents of a young child.

Based on this research it is proposed that parents who are more attuned to the opinions of others can be categorized as other-directed, and are expected to be more responsive to normative appeals to perform a particular behavior than to attitudinal appeals, compared with other parents. Parents who are more aware of their own attitudes, in contrast, are expected to be more responsible to attitudinal appeals to perform a particular behavior than to normative appeals, compared with other parents. Research on private self-consciousness and self-monitoring provides some empirical basis for these expectations. Specifically, individuals who were low as compared to high in private self-consciousness were shown to be more likely to modify their behavior to make it consistent with the opinions of others (Froming & Carver, 1981), as were individuals who were high as compared to low in self-monitoring (Snyder & Monson, 1975). Other studies studied the separate effects of either self-consciousness (Davis et al., 1982; Scheier, 1980) or self-monitoring (Ajzen et al., 1982; Snyder & Kendzierski, 1982; Snyder & Swann, 1976, Hillhouse, Turruisi, & Kastner, 2000; Prislin & Kovrlija, 1992) upon the attitude-behavior relationship.

Miller and Grush (1986) examined the joint effects of these dispositional variables on the attitude-behavior relationship. Miller and Grush (1986) found support

for the relationship between private self-consciousness and self-monitoring and attitude-behavior and norm-behavior correspondences among a sample of college students. As they predicted, attitude-behavior correspondence was higher among subjects who were categorized as high in private self-consciousness and low in self-monitoring (HL), compared with subjects with other combinations of these traits (HH, LH, and LL subjects). In contrast, also as they predicted, norms were more predictive of the behaviors for the HH, LH and LL groups, compared with the HL group.

Limitations of the Miller and Grush (1986) study included that the data are based upon self-report and without experimental control of whether respondents were responding to a normative or an attitudinal message, and that they used a college-aged subject population only. This study, it is hoped, will extend the body of research reviewed here by experimentally manipulating the type of message to which the target population is exposed. It will also look at an older and less homogenous population – parents of young children. This will increase the external validity of the study as well as help address the issue of confounding variables, such as the tendency of subjects to report past behaviors that are consistent with their present attitudes or norms (see McFarland, Ross, & Conway, 1984). Based on the research reviewed here it is hypothesized that certain personality traits will interact with norms and attitudes in their effects on intention. Specifically, it is proposed that normative (vs. attitudinal) messages will interact with other directed (versus inner-directed) personality (defined by high other directed or low private self-consciousness versus others) in their effect on behavioral intentions.

H5a: Parents who are high in other directedness will report higher intention to perform health behaviors when the message type has a normative focus (compared with attitudinal focus), compared with parents who are low in other-directedness.

H5b: Parents who are high in private self-consciousness will report higher intention to perform health behaviors when the message type has an attitudinal focus (compared with a normative focus), compared with parents who are low in private self-consciousness.

1.9 Additional hypotheses: Personality traits and observability

The final hypotheses are from the field of social psychology (rather than communication-focused hypotheses), which are directly implied by the theoretical review outlined earlier. The hypotheses focus on the traits of other-directedness and private self-consciousness, which, it is hoped, will capture the idea of vulnerability to normative influence and other- versus inner-directedness, and have been widely tested and validated. A review of research related to these traits has been described above. Based on this research it is proposed that parents who are more attuned to the opinions of others can be categorized as other-directed, and are expected to be more responsive to observability cues in a scenario describing a health behavior, compared with other parents. Among this

group of parents the presence of a referent other who can observe their behavior is expected to lead to higher behavioral intention

In contrast, parents who are higher in private self-consciousness and more aware of their own attitudes and beliefs are expected to be less responsive to observability cues than parents who are low in this trait. The (positive) effects of observability of behavior on intention to perform sun protection and nutrition behaviors for one's child should be greater among parents who are less focused on their own attitudes, and thus, arguably, less attuned to other factors, such as the presence of another parent.

H6: Intention will vary as a function of observability and other-directedness. Parents high in other-directedness should be more affected by being observed than parents who are low in other-directedness.

H7: Intention will vary as a function of observability and private self-consciousness. Parents high in private self-consciousness should be less affected by being observed than parents who are low in private self-consciousness.

CHAPTER 2:

PILOT STUDY OF OBSERVABILITY MANIPULATION IN TWO HEALTH BEHAVIOR CONTEXTS

2.1 Study purpose

The pilot study for the dissertation was carried out in July of 2009. The purpose of the study was to establish, a priori, that certain components of the major study (which was to include message testing) will work successfully. Specifically, the objectives of the pilot study were to establish each of the following objectives:

1. That there was sufficient variation across parents in intention to perform sun-protection and nutrition behaviors for their child.
2. To determine which of two candidate scenarios for each behavior type was to be chosen for the message-testing study (study 2).
3. Examine the extent to which these health behaviors are driven by the underlying Integrative Model constructs – by (injunctive and descriptive) norms, attitudes and self-efficacy).
4. To examine the internal consistency and distribution of the personality trait scales.

2.2. Pre-test of intention measures for pilot study

A pre-test was conducted on a convenience sample of 26 adults (20 women and 6 men) recruited through snow-ball sampling in June 2009. Pre-tests were e-mailed and

hand delivered to friends and acquaintances who were asked to complete the surveys themselves and to forward them to their friends. No compensation was provided. The pre-test included questions related to the behavioral scenarios that were to be used in the pilot study, including an open-ended question about food and drink items that parents would be likely to provide for their child in the scenario described. Please see Appendix A for the pre-test instrument. This elicitation method was a useful way to ensure that the foods that would be listed in the final intention measure were more likely to be frequently served to children. A tally was kept of the number of times food items were mentioned and the most frequently listed items were included in the final intention measure for the nutrition survey. Results showed the behavioral scenarios to be sufficiently clear and also provided some preliminary information about the degree of variation in sun protection behaviors. Following the pre-test the pilot study was carried out in July 2009 (described below). Please see Appendix B for the results of the (June 2009) pre-test among parents.

2.3 Methods

2.3.1 Sample

Three hundred and nineteen parents of children aged 5 through 9 participated in the first stage of the pilot study in July 2009. Participants were recruited through Survey Sampling International. Survey Sampling International is a survey research company

which recruits subjects and collects extensive profile data to allow the ability to select specific sub-groups of interest for studies. Respondents are invited to participate in a specific survey based on their profile data. Survey Sampling International panel participants are recruited independently of this study and no identifiers were retained.

The participants recruited in July 2009 ranged in age from 18 to 50 and above (most parents were aged 30-39). The majority of participants were white (87.8%). The sample was 66.8% female. 84.3% of the sample were currently married or living with a partner. Table 2.1 (see below) provides further information as to the demographic characteristics of the sample. The study protocol was approved as exempt from review by the University of Pennsylvania's institutional review board (protocol number 810219).

Table 2.1. Demographic characteristics of sample (N=319)

Demographic Characteristics	N	Percent
Gender		
Male	106	33.2
Female	213	66.8
Education		
8th grade or less	3	0.9
Some high school	10	3.1
High school diploma / GED	84	26.3
Some college / 2-year degree	135	42.3
4-year college graduate	56	17.6
More than 4-year college degree	31	9.7
Employment status		
Employed	156	48.9
Not employed	163	51.1
Marital status		
Married or cohabiting	238	84.3
Single	50	15.7
Race/ethnicity		
White	280	87.8
Hispanic / Latino	27	8.5
African-American / Black	26	8.2
Asian American	7	2.2
Other	10	3.1
Age		
18-29	50	15.7
30-39	120	37.6
40-49	97	30.4
50 or older	52	16.3

Children (living at home)		
One	63	19.7
Two	129	40.4
Three	80	25.1
Four	35	11
Five or more	12	3.8
Child's gender (child aged 5-9)		
Male	164	51.4
Female	155	48.6
Child's age		
Five	77	24.1
Six	72	22.6
Seven	59	18.5
Eight	54	16.9
Nine	57	17.9
Child's birth order (child aged 5-9)		
Oldest or only child	113	35.4
A younger child with at least one older sibling	195	61.1
A twin or multiple	11	3.4
Child's health		
Fair	14	4.4
Good	90	28.2
Very good	215	67.4

2.3.2 Design

An online experiment was conducted employing a 2 (behavior type – sun protection or nutrition) x 2 (behavioral scenario – playground/beach for sun protection – play date or picnic outing for nutrition) x 2 (observable / non-observable behavior) between-subjects design. Behavior type, behavioral scenario and observability of the behavior were experimentally varied. (Other directedness and group identification were measured as individual difference variables.) The focus outcome measure for each of the experiments was intention to engage in the behavior recommended by the message

2.3.3 Procedures

After responding to questions about demographic characteristics and personality traits, subjects were asked about their behavioral intentions in a relevant scenario. The intentions measure incorporated the randomized manipulation of observability – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) For each of the four scenarios, both observable and non-observable intention measures were created and participants were randomized to one of the eight conditions below (see Table 2.2):

Table 2.2
Intention measures (behavioral scenarios) – Pilot study, July 2009

Group	Behavior type	Description	Observable / Not
1.	Sun protection	Scenario 1. Playground scenario	Observable
2.	Sun protection	Scenario 1. Playground scenario	Not-observable
3.	Sun protection	Scenario 2. Beach scenario	Observable
4.	Sun protection	Scenario 2. Beach scenario	Not-observable
5.	Nutrition	Scenario 3. Play date scenario	Observable
6.	Nutrition	Scenario 3. Play date scenario	Not-observable
7.	Nutrition	Scenario 4. Picnic outing scenario	Observable
8.	Nutrition	Scenario 4. Picnic outing scenario	Not-observable

Once they had responded to questions measuring intention related to the behavioral scenario (i.e. the outcome measure), all subjects were given a manipulation check for the observability manipulation. All subjects then responded to questions about attitudes, injunctive and descriptive norms and self-efficacy beliefs relating to providing healthy foods to or engaging in sun-protection behaviors for their child. A table describing the procedures for the pilot study is presented below (see Table 2.3). The complete questionnaire for the pilot study is provided in Appendix (see Appendix G).

Table 2.3 Procedures for the pilot study (July 2009)

	Questionnaire items	**Description**
1	Demographic questions	Subjects responded to questions about personal and family characteristics as well as other variables that are expected to be related to the outcome.
2	Traits and moderators	• Other directedness scale • Private Self-consciousness scale • Group identity
3	Intention measure (behavioral scenario)	Participants received one of eight behavioral scenarios and asked to note whether they intended to perform sun-protection or nutrition behaviors for their child.
4	Manipulation check	All subjects responded to a manipulation check for observability
5	Integrative Model measures	Subjects answered questions about attitudes, injunctive and descriptive norms and self-efficacy beliefs relating to the behavior.

2.3.4 Measures

2.3.4.1 Personality traits

Below are descriptions of the personality trait measures. Information about these measures, their internal consistency, and their distribution is listed after the description of these measures (see Table 2.4).

Other-directedness

The other-directedness measure is an 11-item sub-scale of the 25-item Self-Monitoring Scale (Snyder, 1974). In a confirmatory factor analysis of the Self-Monitoring scale (Snyder, 1974), Briggs, Cheek, and Buss (1980) propose that this sub-scale, which forms one factor, should be used to measure Other-directedness. Subjects were asked to indicate the strength of their agreement with each of the eleven statements (below), using a 5-point Likert scale in which 5 = Strongly agree; 4 = Agree; 3 = Neither agree nor disagree; 2 = Disagree; and 1 = Strongly disagree.

1. *In different situations and with different people, I often act like very different persons*
2. *In order to get along and be liked, I tend to be what people expect me to be rather than anything else*
3. *I am not always the person I appear to be*
4. *I guess I put on a show to impress or entertain people*
5. *Even if I am not enjoying myself, I often pretend to be having a good time*
6. *I may deceive people by being friendly when I really dislike them*
7. *I would not change my opinions (or the way I do things) in order to please someone or win their favor (Reverse coded)*
8. *I feel a bit awkward in company and do not show up quite as well as I should (Reverse coded)*

9. *When I am uncertain how to act in social situations, I look to the behavior of others for cues*
10. *My behavior is usually an expression of my true inner feelings, attitudes, and beliefs (Reverse coded)*
11. *At parties and social gatherings, I do not attempt to do or say things that other will like (Reverse coded)*

Responses to the other-directedness scale were summed when a higher score indicates higher reported other-directedness. This scale was also mean centered to reduce multicollinearity in the regression analysis. Because moderated regression analyses include multiplicative terms that could be highly correlated with their constituents, it is advisable to center the terms prior to estimating regression coefficients (Cohen & Cohen, 1983, Yi, 1989).

Private Self-consciousness

The Private Self-Consciousness scale (Scheier & Carver, 1985) is a revised version of the 23-item Self-Consciousness scale devised by Fenigstein, Scheier, & Buss (1975). Scheier & Carver (1985)'s 9-item Private Self-Consciousness scale was adapted for use among non-college populations. Subjects were asked to indicate the extent to which the following statements are accurate descriptions of themselves on a scale in which 3 = 'A lot like me'; 2 = 'Somewhat like me'; 1 = 'A little like me'; and 0 = 'Not at all like me'.

1. *I'm always trying to figure myself out*
2. *I never take a hard look at myself (Reverse coded)*
3. *I often daydream about myself*
4. *I'm constantly thinking about my reasons for doing things*
5. *I generally pay attention to my inner feelings*
6. *I sometimes step back (in my mind) in order to examine myself from a distance*
7. *I'm quick to notice changes in my mood*
8. *I know the way my mind works when I work through a problem*
9. *I think about myself a lot*

Responses to the private self-consciousness scale were summed when a higher score indicates higher reported self-consciousness. This scale was also mean centered to reduce multicollinearity in the regression analysis.

Perceived group identification

A measure of group identification with other parents of young children was based on scales used by Terry, Hogg, and Duck (1999), Hogg, Cooper-Shaw, and Holzworth (1993), and by Brown, Condor, Mathews, Wade, and Williams (1986). Previously employed measures of perceived group identification were designed to assess strength of identification with the reference group (e.g. the extent to which being a psychology student or a university student was a relatively more enduring component of subjects' self

concepts). The items in the measure of group identification in the current study assess strength of identification with other parents of young children. Subjects were asked to indicate the strength of their agreement with each statement (below), using a using a 5-point Likert scale in which 5 = “To a very great extent”, and 1 = “Not at all”.

1. *How much do you identify with most of the other parents of young children that you know?*
2. *How much do you feel yourself as belonging to the group of people who are parents of young children?*
3. *How much do you get along with most of the other parents of young children that you know?*
4. *How much do you feel strong ties with most of the other parents of young children that you know?*
5. *How attached do you feel to most of the other parents of young children that you know?*
6. *How similar do you feel in terms of general attitudes and opinions to most of the other parents of young children that you know?*

Responses to the 6-item scale were summed when a higher score indicates higher reported identification with other parents. This scale was also mean centered to reduce multicollinearity in the regression analysis. Table 2.4 (below) provides information about the distribution and internal consistency of the trait measures described above.

Table 2.4 Trait measures (N=319)

Other Directed scale Range (12-43)		**Other Directed scale**	**N**	**Percent**
Mean (SD)	28.81 (5.6)	Inner directed	148	46.4
Cronbach's Alpha	0.78	Outer directed	171	53.6
Median	29.00			
Skewness	-0.24			
Std. error skewness	0.14			
Kurtosis	-0.12			
Std. error kurtosis	0.27			
Private Self-Consciousness Range (0-24)		**Private Self-Consciousness**	**N**	**Percent**
Mean (SD)	12.46 (4.62)	Low self-consciousness	164	51.4
Cronbach's Alpha	0.75	High self-consciousness	155	48.6
Median	12.00			
Skewness	-0.09			
Std. error skewness	0.14			
Kurtosis	0.06			
Std. error kurtosis	0.27			
Perceived Group Identification Range (6-30)		**Perceived Group Identification**	**N**	**Percent**
Mean (SD)	18.65 (5.2)	Low identification	160	50.2
Cronbach's Alpha	0.92	High identification	159	49.8
Median	18.00			
Skewness	-0.12			
Std. error skewness	0.14			
Kurtosis	0.23			
Std. error kurtosis	0.27			

2.3.4.2 Dependent variables

As the design of the study did not allow for the measure of actual behavior, the primary dependent variables of interest were intentions as described by the Integrative Model (Fishbein, 2000; Fishbein et al., 2002; Fishbein and Ajzen 2010). The intention measure for the pilot study incorporated the observability manipulation

Participants were asked to imagine themselves in the same scenario and then note the extent to which they would be likely to perform the sun-related or nutrition-related health behaviors. For observable conditions, the scenario included a sentence noting that another parent of young children, such as themselves, could observe their behavior. For the non-observable conditions the same scenario explicitly noted either that they were alone (the implicit message was that they could not be observed) or, in the case of the play date scenario (nutrition), did not include any mention of absence or presence of another person. As the playdate scenario describes a domestic (compared to a social) setting in which the participants were unlikely to assume that another parent was present, the decision was made not to explicitly refer to the absence of another parent, as participants in this condition might be alerted to the manipulation.

As only one of the two scenarios for each behavior type (sun protection and nutrition) was chosen for use in the subsequent data collection, the measures below describe the intention measures for only these two scenarios. The other intention measures (the beach scenario for groups 3 and 4 in the sun protection survey, and the

picnic outing scenario for groups 7 and 8 in the nutrition survey) are described in the questionnaire for the pilot study (see Appendix C).

Table 2.5 (below) shows the distribution of the two dependent variables and their internal consistency.

Table 2.5 Dependent variables (intention measures) (N=155)

Intention measure – Sun protection – Playground scenario (n=70)	
Cronbach's Alpha	0.83
Mean	6.19
Median	6.40
Std. Dev	2.00
Skewness	0.0
Kurtosis	-.63
Range	1-10
Intention measure – Nutrition (healthy food) – Play date scenario (n=85)	
Cronbach's Alpha	0.74
Mean	6.91
Median	7.25
Std. Dev	1.78
Skewness	-0.81
Kurtosis	0.37
Range	1-9

Descriptions of the dependent variables used in the pilot study are provided below:

Nutrition

Dependent Variable: Intention to serve one's child healthy foods

To assess intention to perform nutrition behaviors subjects were randomized to either the observable or the non-observable version of the following scenario, as follows: *"Imagine you are home with your child (think of your youngest child aged between 5 and 9) at 5pm on a typical Sunday evening. Your child has a friend over for an afternoon play date, and you are about to prepare dinner for the children to eat. "*

For subjects assigned to the observable condition the next sentence was:

"As you begin preparing the meal, your child's friend's parent arrives and you invite him/her to join you in the kitchen and stay until the children have had dinner"

For subjects assigned to the non-observable condition the text continues directly to the question below:

"*How likely are you to include the following foods in the meal you serve your child and his/her friend*?"

Parents were presented with twelve different food items and are asked to note the likelihood of including each in the meal on a scale ranging from 1 = '*Extremely unlikely*' to 10 = '*Extremely likely*'. The food items were (1) Meat – grilled or baked (2) Fish (3) Meat – fried or pre-cooked (4) Side dish (5) Pizza (6) Water (7) Milk (8) Drinks other than water or milk (9) Fruit/s (10) Vegetable/s (11) Dessert (baked), and (12) Dessert (frozen).

As the nutrition items included both healthy options and unhealthy options (and some that were neutral, such as side dishes), factor analysis was conducted to determine how the items grouped into sub-components. The (varimax) rotated component matrix indicated that there were four principal components which had eigenvalues greater than 1, but one of the components included four foods that could be considered healthy. As the focus of the study was to predict intention to feed children healthy foods, the sub-component which included only healthy foods was used in the study – this component included water, fruit, vegetables, and milk. Responses to these four items were averaged to form a continuous measure for intention (Cronbach's alpha = 0.74). The intention measure for nutrition ranged from 0 to 9 (Mean=6.91, SD=1.78, Media=7.25).

Sun protection

Dependent Variable: Intention to practice sun protection behaviors for one's child

Participants assigned to a sun protection behavioral scenario were asked to imagine that they were in a "*local park or playground with your child (think of your youngest child aged between 5 and 9) on a typical summer (weekend) day at midday*". Participants assigned to the observable behavioral scenario were then told that "*You are accompanied by friends - who are also parents of young children like yourself* ". In contrast, participants who were assigned to the non-observable scenario were told that "*You are not accompanied by other family members or friends*". For this behavioral scenario, in the non-observable condition, parents were informed that they could not be

observed by referent others. In contrast, in the nutrition scenario (see above), parents in the non-observable conditions were not provided with information as to the presence of another parent.

The decision to use different means of manipulating non-observable vs. observable in the two behavioral scenarios (nutrition and sun protection) was based on the presumption that parents in the playground scenario would be likely to assume that they *are* observable unless specifically informed that they were alone, given that the setting itself is public. However, in the play date scenario in which they were in a private setting (their own home), parents would be more likely to assume that they were *not* in the company of other parents (unless they were told that another parent was present). In addition, the mention of another parent not being present might have also led to the inadvertent priming of observability among parents in the non-observable nutrition groups, potentially undermining the manipulation.

All participants in the sun protection groups (observable and not-observable) were then asked to note on a 10-point Likert scale how likely it would be that they performed five sun protection behaviors when 1=Extremely unlikely and 10=Extremely likely: (1) Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade), (2) Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary), (3) Make sure that my child is wearing a shirt that covers his/her chest and arms, (4) Make sure that my child is wearing a hat, and (5) Make sure that my child is wearing sunglasses. Respondents were assigned a mean score for all items

measuring intention. Responses to these five items were averaged to form a continuous measure for intention to protect one's child from the sun (Cronbach's alpha = 0.85). The intention measure for sun protection ranged from 1 to 9 (Mean=6.08, SD=2.36, Median=6.40).

For both the sun protection and nutrition surveys, once subjects responded to the intention measure they were asked to recall, in the scenario they had read earlier, whether they were (a) alone (b) with their child only, or (c) with their child and another parent/s of young children. (Results of the manipulation check will be presented later in this chapter.)

2.3.4.3 Integrative Model variables

This section describes the measures of attitudes, descriptive and injunctive norms, and self-efficacy for the nutrition survey and the sun protection survey separately[1]. Information about these measures and their distribution and internal consistency is provided in Table 2.6 (below).

[1] All measures described here were mean centered to reduce multicollinearity in the regression analysis.

Table 2.6 Integrative Model variables (N=319)

Descriptive norms		**Attitudes**	
Sun protection (Groups 1 and 2, n=70)		***Sun protection (Groups 1 and 2, n=70)***	
Cronbach's Alpha.	0.87	Cronbach's Alpha.	0.92
Mean	0.54	Mean	1.17
Std. Dev	1.51	Std. Dev	1.62
Median	0.40	Median	1.66
Range	-3 to +3	Range	-3 to +3
Nutrition – healthy foods (Groups 5 and 6, n=85)		***Nutrition – healthy foods (Groups 5 and 6, n=85)***	
Cronbach's Alpha.	0.88	Cronbach's Alpha.	0.80
Mean	1.15	Mean	2.10
Std. Dev	1.46	Std. Dev	0.95
Median	1.25	Median	2.42
Range	-3 to +3	Range	-3 to +3
Injunctive norms		**Self-Efficacy**	
Sun protection (Groups 1 and 2, n=70)		***Sun protection (Groups 1 and 2, n=70)***	
Cronbach's Alpha.	0.86	Cronbach's Alpha.	0.90
Mean	0.42	Mean	1.48
Std. Dev	1.56	Std. Dev	1.71
Median	0.40	Median	2.00
Range	-3 to +3	Range	-3 to +3
Nutrition – healthy foods (Groups 5 and 6, n=85)		***Nutrition – healthy foods (Groups 5 and 6, n=85)***	
Cronbach's Alpha.	0.86	Cronbach's Alpha.	0.83
Mean	1.63	Mean	2.20
Std. Dev	1.33	Std. Dev	1.09
Median	1.75	Median	2.25
Range	-3 to +3	Range	-3 to +3

A description of the Integrative Model measures is provided for the nutrition and sun protection groups (separately) below:

Nutrition

A direct measure of parents' attitudes toward feeding their child each of these four healthy food items (fruit, vegetables, water, and milk) '*for dinner on a typical Sunday evening at home when the child has a friend over for a play date*' was measured through a set of three semantic-differential type scales. These were 7-point scales in which 1=useless and 7=useful, 1=Unenjoyable and 7=enjoyable, and 1=foolish and 7=wise. Responses to each of these three sub-factors were averaged for each food item and responses to all four items were averaged for each subject. The attitude measure ranged from -3 to +3 (Cronbach's alpha=0.80), Mean=2.10, SD=0.95, Median=2.42).

Parents' descriptive norms regarding serving their child healthy food were measured by asking subjects to indicate the strength of their agreement with the statement '*Most parents of a child aged 5 through 9 like myself (who are important to me) will give their child the following foods and drinks on a typical Sunday evening at home when the child has a friend over for a play date'*. Responses to 7-point scales ranging from 1=Disagree and 7=agree were averaged across all four healthy food items (fruit, vegetables, water, and milk) to form a measure of descriptive norms. The descriptive norms measure was a continuous variable which ranged from -3 to +3 (Cronbach's alpha = 0.88, Mean=1.15, SD=1.46, Median=1.25).

Parents' injunctive norms regarding feeding their child healthy foods were measured by asking subjects to indicate the strength of their agreement with the statement '*Parents of a child aged five through 9 like myself (who are important to me) think I should give my child the following foods and drinks for dinner on a typical Sunday evening at home when the child has a friend over for a play date*'. Responses to 7-point scales ranging from 1=Disagree and 7=agree were averaged across all four healthy food items (fruit, vegetables, water, and milk) to form a measure of injunctive norms. The injunctive norms measure ranged from -3 to +3 (Cronbach's alpha = 0.86, Mean=1.63, SD=1.33, Median=1.75).

Finally, a measure of parents' self-efficacy with regard to serving their child healthy foods was measured by asking parents to indicate the strength of their agreement with the statement '*If I really wanted to, I could give the following foods and drinks to my child for dinner on a typical Sunday evening at home when the child has a friend over for a playdate'*. Responses to 7-point scales ranging from 1=Disagree and 7=agree averaged for each food item and responses to all four items were averaged for each subject to form a measure of self-efficacy. The measure was a continuous variable which ranged from -3 to +3 (Cronbach's alpha=0.83, Mean=2.20, SD= 1.09, Median=2.25).

<u>Sun protection</u>

A direct measure of parents' attitudes toward protecting their child from the effects of exposure to the sun '*during the midday hours at the local park or playground*

on a typical summer's weekend day at noon' was measured through a set of three semantic-differential type scales. These were 7-point scales in which 1=useless and 7=useful, 1=Unenjoyable and 7=enjoyable, and 1=foolish and 7=wise. Responses to each of these three sub-factors were averaged for each of the five sun protection behaviors and responses to all four items were averaged for each subject. The attitude measure was a continuous variable which ranged from -3 to +3 (Cronbach's alpha = 0.92, Mean=1.17, SD=1.62, Median=1.66).

Parents' descriptive norms regarding protecting their child from the effects of exposure to the sun were measured by asking subjects to indicate the strength of their agreement with the statement '*Most parents of a child aged 5 through 9 like myself (who are important to me) will do the following this summer at the local park or playground on a typical summer's weekend day at noon'*. Responses to 7-point scales ranging from 1=Disagree and 7=agree were averaged across all five behaviors to form a measure of injunctive norms. The descriptive norms measure was a continuous variable which ranged from -3 to +3 (Cronbach's alpha = 0.87, Mean= 0.54, SD= 1.51, Median=0.40).

Parents' injunctive norms regarding protecting their child from the effects of exposure to the sun were measured by asking subjects to indicate the strength of their agreement with the statement '*Parents of a child aged five through 9 like myself (who are important to me) think I should do the following this summer at the local park or playground on a typical summer's weekend day at noon*'. Responses to 7-point scales ranging from 1=Disagree and 7=agree were averaged across all five behaviors to form a

measure of injunctive norms. The injunctive norms measure was a continuous variable which ranged from -3 to +3 (Cronbach's alpha = 0.86, Mean=0.42, SD=1.56, Median = 0.40).

Finally, a measure of parents' self-efficacy with regard to performing sun protection behaviors for their child was measured by asking parents to indicate the strength of their agreement with the statement '*If I really wanted to, at a local park or playground with my child on a typical summer weekend day at midday I could do the following'*. Responses to 7-point scales ranging from 1=Disagree and 7=agree were averaged across all five behaviors to form a measure of self-efficacy. The measure was a continuous variable which ranged from -3 to +3 (Cronbach's alpha = 0.90, Mean=1.48, SD=1.71, Median=2.0).

Other Measures

Below (see Table 2.7 and Table 2.8) are the distributions of other health-related measures for the pilot study (July 2009).

A measure of parent's (own) nutritional behaviors was obtained by asking subjects to indicate the strength of their agreement with each of four items, using a using a 6-point Likert scale in which 6= Strongly agree, and 1=Strongly disagree. The items included '*I eat a low fat diet*', '*I eat a low sugar diet'*, '*I eat at least three servings of fruit per day'*, and '*I eat at least 3 servings of vegetables per day*'. The mean response to these four items was calculated to create a measure of parent's nutritional behaviors

(Mean=3.66, SD=1.27). Table 2.7 (below) provides additional information about this measure and other nutrition-related measures.

Table 2.7 Nutrition variables (n=163)

Variables	N	Percent
BMI		
Underweight (BMI<18)	101	62.3
Normal (BMI = <25.0)	48	29.6
Overweight (BMI = >25 <=30)	10	6.2
Obese (BMI >30)	3	1.9
Parent's perception of child's weight		
Very underweight	1	0.3
Underweight	25	7.8
About average weight	120	37.6
A little overweight	15	4.7
Very overweight	2	0.6
Perceived responsibility for child's nutrition	***Mean***	***Std.Dev***
Range (2-5)	4.16	0.88
Parent's nutrition behavior (Cronbach's alpha = 0.84)		
Range (1 to 6)		
Scale Mean= 3.66, SD= 1.27	***Mean***	***Std.Dev***
Low fat diet	3.54	1.62
Low sugar diet	3.55	1.51
Eat at least 3 servings of fruit per day	3.63	1.5
Eat at least 3 servings of vegetables per day	3.9	1.59

Similarly, among parents in the sun protection survey, a variable measuring parent's (own) reported sun protection behaviors was obtained by asking subjects to indicate the strength of their agreement with each of five items, using a using a 6-point

Likert scale in which 6= Strongly agree, and 1=Strongly disagree. The items were matched to the five sun protection behaviors used in the intention measure (see above). The mean response to these five items was calculated to create a measure of parent's own sun protection behaviors (Mean=3.81, SD=1.12). Table 2.8 (below) provides additional information about this measure and other sun-protection related measures.

Table 2.8 Sun protection variables (n=156)

Variables	N	Percent
Child's skin type		
Burns easily	18	5.6
Burns at first then tans	32	10
Burns occasionally and tans slowly	33	10.3
Rarely burns and always tans	47	14.7
Never burns and tans quickly	26	8.2
Perceived responsibility for child's sun protection	***Mean***	***Std. Dev***
Range (0-5)	4.0	0.96
Parent's sun protection behavior (Cronbach's alpha = 0.68) *(Range = 1 - 6)*		
Scale Mean= 3.81, SD= 1.12	***Mean***	***Std.Dev***
• Apply sunscreen (SPF 15+)	6.36	2.95
• Seek shade during midday hours	7.46	2.73
• Wear protective clothing	6.69	2.91
• Wear a hat	4.7	3.07
• Wear sunglasses	4.43	2.92

2.4 Results

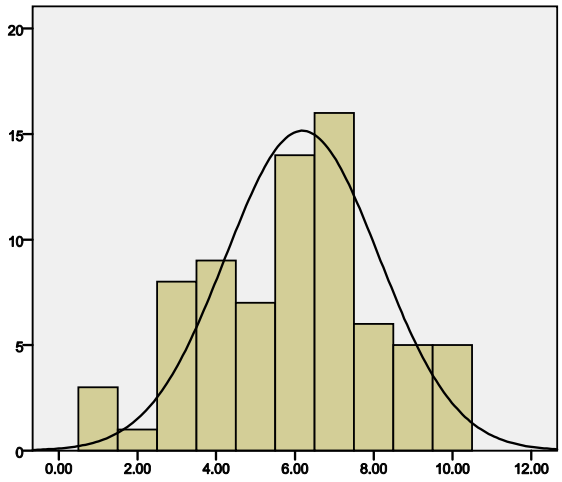
2.4.1 Objective 1. Distribution of intention measure (outcome)

The first objective of the pilot study was to establish that there was sufficient variation across parents in intention to perform a variety of health behaviors (nutrition-related and sun-protection behaviors). Section 2.3.4.2 provides information about how each of the intention measures was created. Table 2.5 provides descriptive statistics for each of the intention measure as well as their internal consistency.

Below are histograms illustrating the distribution of responses and statistics for the continuous measures of intention to perform sun protection behaviors in groups 1 and 2 (i.e. the playground/park scenario) and groups 3 and 4 (i.e. the beach scenario).

For scenario 1 (playground scenario – sun protection) , the frequency distributions for these intention measures shows sufficient variation in parents' intention to perform sun protection behaviors to allow for these measures to be used as dependent variables in analysis. The distribution of responses for the intention measure for scenario 1, the playground scenario, (groups 1 and 2) is also closer to normal (see Figure 2.1 below), and is more symmetrical overall, compared with that for scenario 2, the beach scenario (groups 3 and 4) (see Figure 2.2 below).

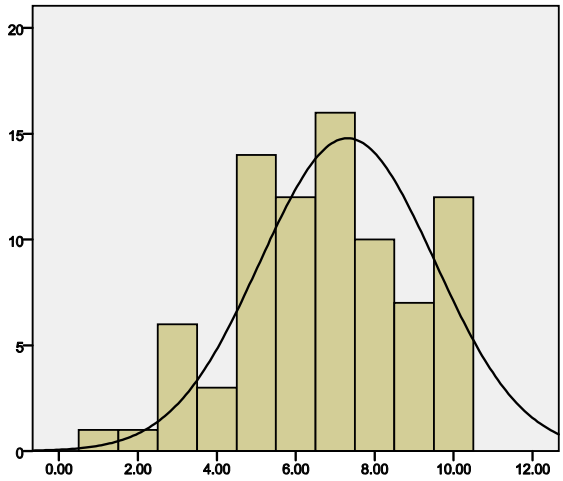
Figure 2.1
Histogram – Intention (Sun protection– Scenario 1)



Mean = 5.93
Std. Dev = 2.24
N=74

Intention to protect one's child from the sun – **playground scenario** (Groups 1 and 2)

Figure 2.2
Histogram – Intention (Sun protection– Scenario 2)



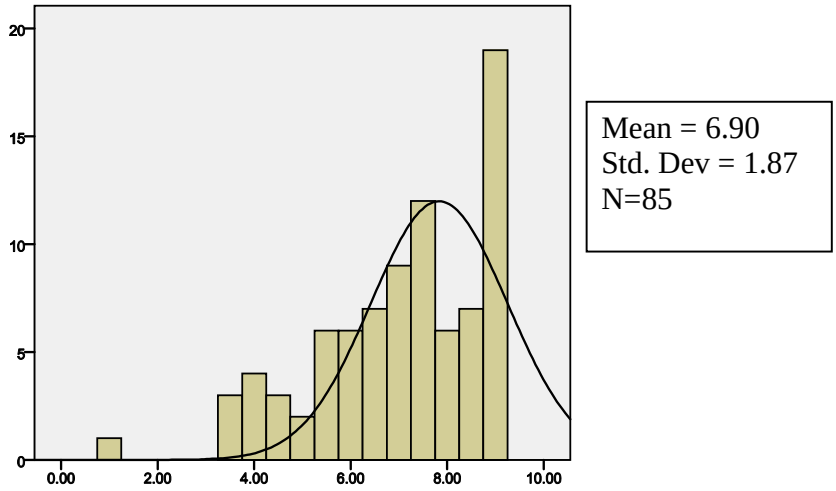
Mean = 6.67
Std. Dev = 2.24
N=82

Intention to protect one's child from the sun – **beach scenario** (Groups 3 and 4)

Nutrition - Scenario 3 (Groups 5 and 6):

As the nutrition items ranged from healthy options to unhealthy options (and some that were neutral, such as side dishes), factor analysis was conducted to determine how the items grouped into sub-components. The (varimax) rotated component matrix indicated that there were four principal components – four of which had eigenvalues greater than 1. The first component included – water, milk, fruit, and vegetables. The second included fried meat, pizza, frozen dessert, and baked dessert. The third included side-dishes and 'drinks other than milk or water' and the fourth included fish. However, the third and fourth components had relatively low eigenvalues and were negatively correlated with the first two, so were not included in the final intention measures. Responses to the four items (water, milk, fruits and vegetables) in component 1 were averaged to form a scale of 'healthy foods' (Cronbach's alpha = 0.74). Below is the distribution for this measure.

Figure 2.3
Histogram – Intention (Nutrition– Scenario 3)



Intention to serve one's child healthy food – **Play date scenario** (Groups 5 and 6)

The distribution for intention to provide healthy foods is skewed to the left, with many parents reporting extreme positive responses for these items (social desirability bias might account for this). However, as the recommended behavior is to provide healthy foods it was hoped that this will not pose a significant obstacle to subsequent analyses.

Nutrition - Scenario 4 (Groups 7 and 8):

The (varimax) rotated component matrix for groups 7 and 8, the picnic scenario, indicated that there were four principal components. However, in contrast to groups 5 and 6, the components included inconsistent and unexpected groupings of food items. For example, fruit and vegetables loaded onto separate components, contrary to

expectations, and vegetables, milk, side dishes, fish and grilled meat loaded onto a single component. In addition, the internal consistency of the food groupings for scenario 4 was lower than for scenario 3. Cronbach's alpha was 0.72 for the 'healthy foods' index (vegetables, milk, fish and grilled meat).

Integrative Model Variables

A description of the Integrative Model measures is provided in the measures section (see section 2.3.4.3). Table 2.6 (in section 2.3.4.3) and Table 2.21 (in section 2.6.3) show the distribution of these measures and their internal consistency.

2.4.2 Objective 2. Evaluation of scenarios for study 2

In order to choose the scenario that worked best in the pilot study for use in additional data collection for study 1 and the major dissertation study (study 2), a set of criteria were determined for purposes of comparison. For all intention measures, criteria for the evaluation of measures included:

1. Normality and lack of skewness of distribution
2. Internal consistency (Cronbach's alpha of 0.70 or higher)

For scenarios 3 and 4 (nutrition):

3. Principal component analysis should show that food items that should reasonably group together (for example, fruits with vegetables, and milk with water) do load onto the same factor.

As the intention measure for scenario 1 (groups 1 and 2) was more normally and symmetrically distributed, and had a higher internal consistency than for scenario 2 (groups 3 and 4), scenario 1 was the sun protection scenario chosen for use in the second stage of data collection for study 1 and for study 2. The intention measures for healthy foods and unhealthy foods for scenario 3 and (groups 5 and 6) had greater internal consistency than the same measures for scenario 4 (groups 7 and 8). In addition, the results of the principal component factor analysis of the nutritional items for scenario 3 were more consistent with expectations than the results for scenario 4. As a result, scenario 3 was chosen to be employed as a dependent variable in subsequent data collection for the dissertation. The analysis of the pilot study data presented below will also focus on these scenarios.

There are a number of possible explanations for these observed differences across scenarios. For the beach scenario, there was an overall tendency for parents to report high intention to perform sun protection behaviors, which limited the effects of observability on the outcome. For the (picnic) outing scenario, the behavior itself was problematic. In contrast to the playground scenario in which the parent was asked to picture themselves in a situation in which their behavior was observable at the same time, in scenario 4, parents were asked to imagine themselves preparing food in the present for a later event that will be observable. This time lapse is likely to have confused participants.

2.4.3 Objective 3. Applying the IM to predicting preventive health behaviors

This section describes the results of models which examine the extent to which the two preventive health behavior types are driven by the underlying IM constructs – by norms, attitudes, or self-efficacy. It should be noted that, given the fact that these models were run on small samples (between 70 and 85 subjects) for the two scenarios described, the results were considered a preliminary examination only. The distribution and internal consistency of the IM constructs is provided earlier (see Table 2.6).

Scenario 1 – Sun protection in playground scenario – Groups 1 and 2

In an OLS regression model (n=70) applying the IM to predict intentions to protect one's child from the sun (in the specific scenario described), attitudes were significantly associated with intention (β=-0.428, $p < 0.01$). Injunctive norms were also positively associated with intention although the association was not significant (β=0.283, $p < 0.11$). Self-efficacy and descriptive norms were not significantly associated with the outcome. The IM factors accounted for 49% (adjusted R square) of the variance in intention (R=0.72).

Scenario 3 – Nutrition in play date scenario – Groups 5 and 6

In an OLS model (n=85) predicting intention to provide healthy foods (a mean scale including fruit, vegetables, milk and water), attitudes toward the behavior (β=0.56, $p <0.001$) were significantly associated with intention. Descriptive norms were also associated with intentions although the association was only marginally significant

(β=0.18, p=0.07). Injunctive norms and self-efficacy were not significantly associated with the outcome (p>0.05). Integrative Model components accounted for 46% (R=0.71) of the variance in intention to provide healthy foods.

Overall, the Integrative Model accounted for a substantial portion of the variance in intention for scenarios 1 and 3. Both attitudes and norms were shown to be associated with intention. This finding was important, given that interactions between attitudes and norms and other factors in their joint effects on intention are tested in study 2.

2.4.4 Objective 4 –Internal consistency and distribution of trait measures

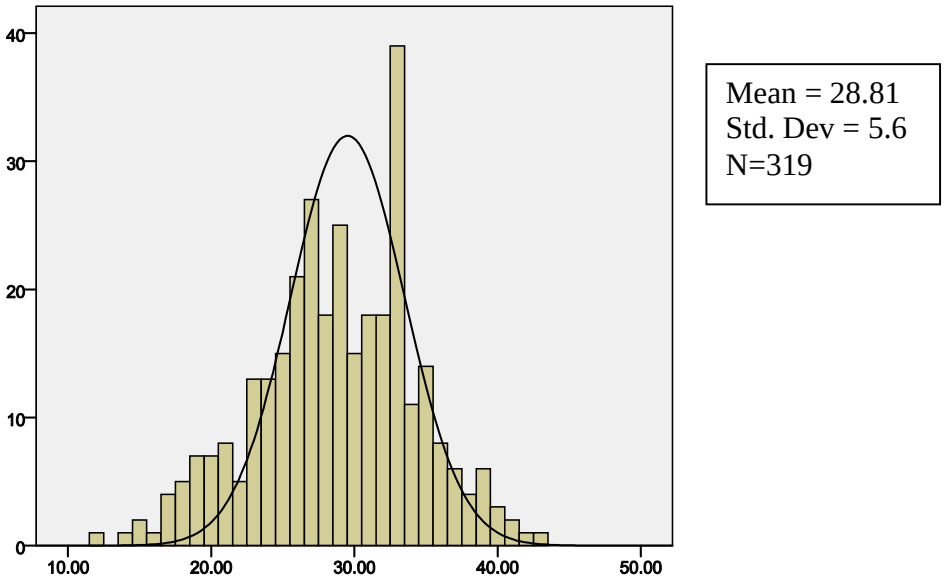
Another objective of the pilot study was to examine the internal consistency and distributions of the trait measures prior to their employment in study 2. The correlations between these measures are also provided. These scales are derived from existing research and are discussed in the theoretical review (see Chapter 1). Below is a description of the scales based on responses collected from the pilot study. Additional information about the distribution and internal consistency of these scales is provided in Table 2.6 (in section 2.3.4.1, following the descriptions of the scales).

Other–Directedness scale (Briggs, Cheek, & Buss, 1980)

Responses to the 11-item Other-Directedness scale (Briggs, Cheek, & Buss, 1980) were summed, and four items were recoded in the direction of high self-monitoring (i.e. high other directedness). This scale was then mean centered to reduce multicollinearity in the regression analysis. The Other-directedness scale showed a reasonable internal

consistency when 2 items were removed[2] (Cronbach's alpha was 0.78). Previous studies have used a median split for this scale, so a dichotomous version of inner- vs. other-directed subjects was created, using a median split (at the value of 29). 148 subjects (46.4%) are categorized as 'Inner directed' and 171 subjects (53.6%) as 'Other directed'. Below (see Figure 2.4) is the distribution for the other-directedness scale.

Figure 2.4
Other-Directedness scale (Study 1)



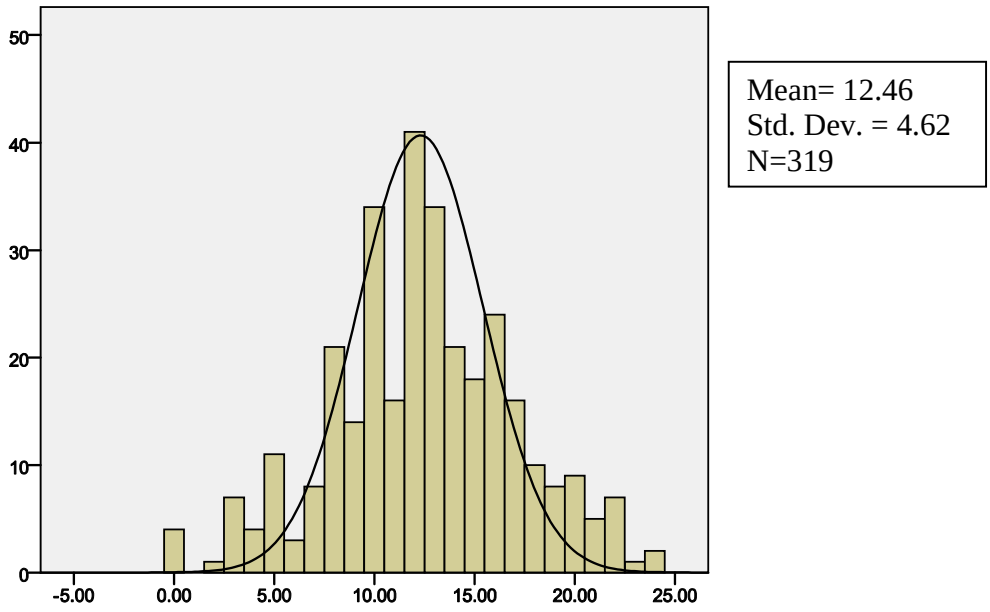
[2] These two items were reverse coded and had negative inter-total correlations with the other nine items. They were '*I feel a bit awkward in company and do not show up quite as well as I should* ' and '*At parties and social gatherings, I do not attempt to do or say things that others will like*'. When they were excluded Cronbach's alpha was increased from 0.62 to 0.78.

Private Self-Consciousness scale (Scheier & Carver, 1985)

Responses to the 8-item Private Self-Consciousness scale (Scheier & Carver, 1985) were summed and one item was recoded in the direction of high self-consciousness. The scale showed a reasonable internal consistency (Cronbach's alpha was 0.70 for all 9 items). With one item (item 3) removed from the scale the internal consistency was improved (Cronbach's alpha=0.75)[3]. The final scale includes 8 items from the sub-scale. Previous studies have used a median split for this scale, so for the current study a dichotomous version of high vs. low self-consciousness, using a median split (at the value of 12). 164 subjects (51.4%) are categorized as having 'Low self-consciousness and 155 (48.6%) as having High self-consciousness. Below (see Figure 2.5) is the distribution for the private self-consciousness scale.

[3] This item – '*I never take a hard look at myself*' was the only reverse coded item in the scale and had an inter-item total correlation of 0.00 with the other eight items.

Figure 2.5
Self-consciousness scale (Study 1)

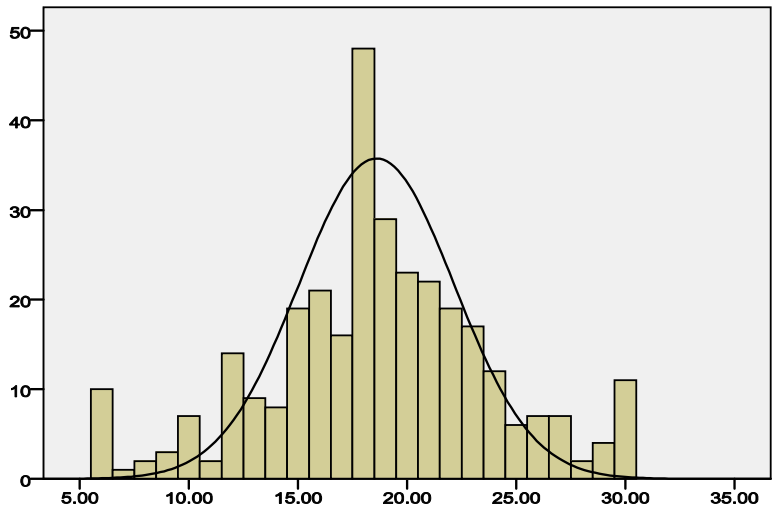


Identification with other parents

Responses to the 6-item scale measuring degree of identification with other parents of young children were summed when a higher score indicates higher reported identification with other parents. The scale showed a high internal consistency (Cronbach's alpha was 0.92 for all 6 items). The final scale includes all 6 items. A dichotomous version of this scale was also created, using a median split (at the value of 18). 160 subjects (50.2%) are categorized as having lower identification with other parents and 159 (49.8%) as having higher identification with other parents. All subjects

are parents of children aged 5 through 9. Below (see Figure 2.6) is the distribution for the perceived group identification scale.

Figure 2.6
Identification with other parents (Study 1)



Mean = 18.65
Std. Dev. = 5.20
N=319

Overall, analysis of the pilot study data found that all three scales were well distributed and had acceptable internal consistency (Cronbach's alpha ranged between 0.75 and 0.92 across scales).

Finally, the correlation between these trait measures was examined. Table 2.9 (below) shows the correlations between the three trait measures used in the pilot study (July 2009). None of these measures were significantly associated with the others.

Table 2.9 Correlations between trait measures – Pilot study (July)

	1	**2**	**3**
1. Other-directed	1	.06	.04
2. Self-conscious	.06	1	.08
3. Identification with other parents	.04	.08	1

*p < .05, **p < .01, ***p < .001

2.4.5 Secondary objectives of the Pilot Study.

In addition to the four primary objectives of the pilot study, described above, two secondary objectives were also examined. The first was to determine whether observability was associated with intention to perform health behaviors. The second was to evaluate the results for the manipulation check for observability.

Association between observability and intention

The pilot study manipulated the observability of several behavioral scenarios by adding a sentence to the same scenario indicating that the behavior could be observed by another parent of young children. While (in the major dissertation study) the effects of observability are tested in relation to individual-level trait measures and exposure to attitudinal vs. normative messages, the pilot data was examined to determine whether observability was associated with intention. Table 2.10 (below) shows the distribution of participants in the observability conditions.

Table 2.10
Observability conditions - Study 1 part 1 (N=319)

	N	%
Sun protection		
Observable	66	20.7
Not observable	90	28.2
	156	
Nutrition		
Observable	77	24.1
Not observable	86	29.9
	163	
Total	**319**	

Below are the preliminary results for scenario 1 and 3.

Scenario 1 – Groups 1 and 2 (Playground scenario)

A Univariate ANOVA was conducted predicting differences in mean for intention to perform sun protection behaviors for one's child; a summary of results are presented below (see Table 2.11). Levene's test for homogeneity of variance was not significant ($p > 0.05$). Main effects reveal that intention was significantly different among parents who received an observable compared with a non-observable behavioral scenario, $F(3,67) = 4.30$, $p<0.05$, partial $\eta^2=0.06$. Intention was significantly higher among parents who received an observable scenario. Estimates of effect size revealed low strength in association.

Table 2.11 Group Means for Intention by Observability (Scenario 1)

	Mean	SD	N
Not observable	1.85	0.79	37
Observable	2.18	0.85	33
Total	2.01	0.83	70

Scenario 3 – Groups 5 and 6 (Play date scenario)

A Univariate ANOVA was conducted predicting differences in mean for intention to provide children with healthy food and for unhealthy foods. There was no significant difference in intention among observable and non-observable groups for healthy food. However, there was a significant difference for intention to serve unhealthy foods; a summary of results are presented below (see Table 2.12). Levene's test for homogeneity of variance was not significant ($p > 0.05$). Main effects reveal that intention was significantly different among parents who received an observable compared with a non-observable behavioral scenario, $F(2,83) = 5.58$, $p < 0.05$, partial $\eta^2 = 0.06$. Intention to serve unhealthy food was significantly lower among parents who received an observable scenario. Estimates of effect size revealed low strength in association.

Table 2.12 Group Means for Observability (Scenario 3)

	Mean	SD	N
Observable	4.66	2.08	38
Not observable	5.71	2.00	47
Total	5.24	2.09	85

Manipulation Check

Another secondary objective of the analysis of the pilot study was to evaluate the results for the manipulation check for observability. Table 2.13 (below) shows the proportion of respondents in each of the eight groups who correctly recalled whether, in the scenario that they received, their behavior was observable by other parents or not (please refer to the questionnaire in the Appendix for question wording). The results of the manipulation check show substantial variation across groups. Correct recall of observability of the behavioral scenario was high among the 'non-observable' groups (groups 2,4,6,8 in Table 1) while recall was a great deal lower among 'observable' groups.

Table 2.13
Manipulation Check for observability (Pilot study – July 2009)

GROUP	N	% correct
1	33	45.5
3	33	47.5
5	38	52.6
7	39	35.9
2	37	85.4
4	34	85.7
6	47	76.6
8	39	87.2
		64.55

It was speculated that the variation in accurate recall of observability may have been, in part, an artifact of the complexity to the manipulation check question and would be improved by simplifying the manipulation check. The version used in the pilot study (below) includes a wide range of options that appear similar to one another and might have been confusing for some subjects.

"*Please think back to the scenario you read earlier and choose the option that most accurately describes who was (said to be) present in this scenario*:"

o	I was alone
o	I was with my child only
o	I was with my child and other friends who are parents of young children
o	I was with my child and my partner
o	I was with my child and other family members
o	I don't recall

Following the pilot study the manipulation check question was reworded to remove confusing options so that participants were asked to choose from (the response options) ‘I *was alone*’, ‘*I was with my child only’*, or ‘*I was with my child and another parent/s of young children*’.

ADDITIONAL DATA COLLECTION (SEPTEMBER 2009)

OBSERVABILITY MANIPULATION IN TWO HEALTH BEHAVIOR CONTEXTS

2.5 Study purpose

The pilot study was productive, in part because it helped differentiate potential scenarios for the projected major study. Also, with the exception of the need for a modified manipulation check it was possible to continue with the rest of the instrument. However, given that only two scenarios were chosen as suitable and only 70 and 85 respondents were exposed to those scenarios the power to test hypotheses of interest was limited. Thus the usable subsample from the pilot test was retained and joined with a new sample to become the sample for study 1.

In September 2009, additional data was collected to allow further examination of the distribution of the intention measures and personality traits, as well as preliminary testing of hypotheses relating to observability and social norms. As mentioned earlier, scenario 1 (playground) was chosen for the sun protection survey and scenario 3 (play date) was chosen for the nutrition survey.

2.6 Methods

2.6.1 Sample

Two hundred and twenty-six parents of children aged 5 through 9 participated in the second stage of (what was now) study 1 in September 2009. Participants were recruited through Survey Sampling International. The participants ranged in age from 18 to 50 and above (most parents were aged 30-39). The majority of participants were white (85.8%). The sample was 84.5% female. 80.5% of the sample were currently married or living with a partner. Table 2.14 and 2.15 (below) provide further information as to the demographic characteristics of these participants and health-related variables.

The combined sample of parents for analysis included 381 parents, including 155 subjects (who were randomized to scenario 1 or scenario 3) from the previous data collection for the pilot study (July 2009) who were pooled together with the additional sample of 226 parents from September 2009. The two samples were combined in order to provide additional statistical power. It was possible to combine these samples since the study instrument used in July and September 2009 did not undergo significant changes.

Table 2.14 Demographic characteristics of sample (n=226)

Demographic Characteristics	*N*	*Percent*
Gender		
Male	35	15.5
Female	191	84.5
Education		
Some high school but did not graduate	9	4.0
High school diploma / GED	53	23.5
Some college / 2-year degree	98	43.4
4-year college graduate	51	22.6
More than 4-year college degree	15	6.6
Employment status		
Employed	97	42.9
Not employed	129	57.1
Marital status		
Married or cohabiting	182	80.5
Single	44	19.5
Race/ethnicity		
White	194	85.8
Hispanic / Latino	29	12.8
African-American / Black	17	7.5
Asian American	5	2.2
Age		
18-29	34	15.0
30-39	84	37.2
40-49	75	33.2
50 or older	33	14.6

Children (living at home)		
One	57	25.2
Two	83	36.7
Three	44	19.5
Four	31	13.7
Five or more	11	4.9
Child's gender (child aged 5-9)		
Male	109	48.2
Female	117	51.8
Child's age		
Five	54	23.9
Six	58	25.7
Seven	43	19.0
Eight	38	16.8
Nine	33	14.6
Child's birth order (child aged 5-9)		
Oldest or only child	82	36.3
A younger child with at least one older sibling	139	61.5
A twin or multiple	5	2.2
Child's health		
Poor or fair	8	3.5
Good	51	22.6
Very good	167	73.9

Table 2.15 Health related variables for sample (N=226)

Nutrition variables (n=117)	*n*	*Percent*
Parent's perception of child's weight		
Underweight	12	11.0
About average weight	83	76.2
Overweight	14	12.8
Parent's nutrition behavior (Cronbach's alpha=0.85)	***Mean***	***Std.Dev***
Range (1 to 6)	3.5 (scale)	1.27 (scale)
o Low fat diet	3.32	1.48
o Low sugar diet	3.35	1.57
o Eat at least 3 servings of fruit per day	3.61	1.49
o Eat at least 3 servings of vegetables per day	3.72	1.56
Sun protection variables (n=109)	***n***	***Percent***
Reaction of child's skin to sun exposure		
Tends to burn easily	17	14.5
Tends to burn at first but then tan	23	19.7
Tends to burn occasionally and tans slowly	19	16.2
Rarely burns and always tans	46	39.3
Never burns and tans quickly	12	10.3
Parent's sun protection behavior (Cronbach's alpha = 0.68	***Mean***	***Std.Dev***
Range (1 through 6)	3.76 (scale)	1.09 (scale)
o Regularly applies sunscreen with SPF 15 or higher	3.70	1.76
o Seeks shade	4.50	1.52
o Wears protective clothing	2.94	1.74
o Wear a hat	2.67	1.74
o Wears sunglasses	4.97	1.38

2.6.2 Procedure

The procedures for this stage of study 1 were almost identical to those described earlier in this chapter for the pilot study[4]. An online experiment was conducted employing a 2 (behavior type – sun protection or nutrition) x 1 (behavioral scenario – playground for sun protection – play date for nutrition) x 2 (observable / non-observable behavior) between-subjects design. Behavior type, behavioral scenario and observability of the behavior were experimentally varied. (Other directedness and group identification were measured as individual difference variables.) The focus outcome measure for each of the experiments was intention to engage in the behavior recommended by the message. The procedures (below) were the same for participants in all 4 conditions.

Table 2.16 Procedures for Pilot Study – Stage 2 (September 2009)

	Questionnaire items	**Description**
1	**Demographic questions**	Subjects respond to questions about personal and family characteristics as well as other variables that are expected to be related to the outcome.
2	**Traits and moderators**	• Other directedness scale • Private Self-consciousness scale • Group identity
3	**Intention measure (behavioral scenario)**	Participants received one of four behavioral scenarios and asked to note whether they intended to perform sun-protection or nutrition behaviors for their child.

[4] The difference was that in this stage only one scenario was used for each behavior type.

4	**Manipulation check**	All subjects responded to a manipulation check for observability
5	**Integrative Model measures**	Subjects answer questions about attitudes, injunctive and descriptive norms and self-efficacy beliefs relating to the behavior.

2.6.3 Measures

For the second stage of the pilot study (September 2009) the manipulation of observability was conducted using four intention measures (2 behavior types x 1 scenarios x Observable / Not observable). Table 2.17 provides the distribution of participants within each of the observability conditions.

Table 2.17
Observability conditions – Pilot study - part 1, part 2 and combined

	Part 1	%	Part 2	%	Combined	%
Sun protection						
Observable	33	21.2	59	26.1	92	24.1
Not observable	37	23.9	58	25.7	95	24.9
	70		**117**		**187**	
Nutrition						
Observable	38	24.5	56	24.8	94	24.7
Not observable	47	30.3	53	23.5	100	26.2
	85		**109**		**194**	
Total	**155**		**226**		**381**	

For each of the four scenarios, both observable and non-observable intention measures were created and participants were randomized to one of the eight conditions below (see Table 2.18):

Table 2.18 Intention measures (behavioral scenarios) – Study 1, July 2009

Scenario	Behavior type	Description	Observable / Not
1.	Sun protection	Playground scenario	Observable
2.	Sun protection	Playground scenario	Not-observable
3.	Nutrition	Play date scenario	Observable
4.	Nutrition	Play date scenario	Not-observable

The intention measures for the two scenarios, as well as questions about demographic characteristic, personality trait measures and Integrative Model measures are described in the questionnaire for the pilot study in the Appendix (see Appendix C). Additional information regarding the distribution and internal consistency of these measures is provided (below) in Tables 2.19 (dependent variables), Table 2.20 (personality trait measures), and Table 2.21 and Table 2.22 (Integrative Model variables).

Table 2.19
Distribution of dependent variables (intention measures)
Pilot study - part 1, part 2 and combined

Intention measure – Sun protection – Playground scenario			
	Part 1 (n=70)	**Part 2 (n=117)**	**Combined (n=187)**
Cronbach's Alpha	.83	.85	.82
Mean	6.19	6.08	6.15
Median	6.40	6.40	6.40
Std. Dev	2.00	2.36	2.19
Skewness	0.0	-.37	-.23
Kurtosis	-.63	-.66	-.65
Range	1-10	1-10	1-10
Intention measure – Nutrition (healthy food) – Play date scenario			
	Part 1 (n=85)	**Part 2 (n=109)**	**Combined (n=194)**
Cronbach's Alpha	.74	.82	.79
Mean	6.91	6.91	6.90
Median	7.25	7.25	7.25
Std. Dev	1.76	1.78	1.63
Skewness	-0.81	-1.05	-.61
Kurtosis	0.37	1.19	-.38
Range	1-9	1-9	1-9

Table 2.20 Personality trait variables
Pilot study - part 1, part 2 and combined

Other-Directedness	**Part 1 (n=319)**	**Part 2 (n=226)**	**Combined (n=381)**
Cronbach's Alpha	**.78**	**.80**	**.79**
Mean	28.81	21.68	21.77
Median	29.00	22.00	22.00
Std. Deviation	5.60	6.34	6.22
Skewness	-.24	.20	.11
Kurtosis	-.12	-.56	-.47
Range	9-38	9-38	9-38

Self-Consciousness	**Part 1 (n=319)**	**Part 2 (n=226)**	**Combined (n=381)**
Cronbach's Alpha	**.75**	**.75**	**.76**
Mean	12.46	12.50	12.47
Median	12.00	12.50	12.50
Std. Deviation	4.62	4.56	4.67
Skewness	-.09	.18	.07
Kurtosis	.06	-.03	.06
Range	0-24	0-24	0-24

Perceived Group Identification	**Part 1 (n=319)**	**Part 2 (n=226)**	**Combined (n=381)**
Cronbach's Alpha	**.92**	**.90**	**.91**
Mean	18.65	19.16	18.71
Median	18.00	19.00	18.00
Std. Deviation	5.20	4.71	4.90
Skewness	-.12	.06	-.05
Kurtosis	.23	-.20	.06
Range	6-30	6-30	6-30

Table 2.21 Integrative Model variables
Pilot study – part 2 (N=226)

Descriptive norms		**Attitudes**	
Sun protection (n=117)		***Sun protection (n=117)***	
Cronbach's Alpha.	.92	Cronbach's Alpha.	.86
Mean	.33	Mean	1.28
Std. Dev	1.71	Std. Dev	1.28
Median	.40	Median	1.53
Range	-3 to +3	Range	-3 to 3
Nutrition (n=109)		***Nutrition (n=109)***	
Cronbach's Alpha.	.86	Cronbach's Alpha.	.82
Mean	1.44	Mean	2.11
Std. Dev	1.31	Std. Dev	.98
Median	1.75	Median	2.33
Range	-3 to +3	Range	-3 to 3
Injunctive norms		**Self-Efficacy**	
Sun protection (n=117)		***Sun protection (n=117)***	
Cronbach's Alpha.	.89	Cronbach's Alpha.	.86
Mean	.54	Mean	1.58
Std. Dev	1.64	Std. Dev	1.40
Median	.40	Median	2.00
Range	-3 to +3	Range	-3 to 3
Nutrition (n=109)		***Nutrition (n=109)***	
Cronbach's Alpha.	.79	Cronbach's Alpha.	.85
Mean	1.75	Mean	2.15
Std. Dev	1.02	Std. Dev	1.10
Median	1.75	Median	2.50
Range	-3 to +3	Range	-3 to 3

Table 2.22 Integrative Model variables
Pilot study – combined sample (N=381)

Descriptive norms		**Attitudes**	
Sun protection (n=187)		***Sun protection (n=187)***	
Cronbach's Alpha.	.90	Cronbach's Alpha.	.88
Mean	.42	Mean	1.30
Std. Dev	1.60	Std. Dev	1.36
Median	.40	Median	1.63
Range	-3 to +3	Range	-3 to 3
Nutrition (n=194)		***Nutrition (n=194)***	
Cronbach's Alpha.	.87	Cronbach's Alpha.	.81
Mean	1.31	Mean	2.14
Std. Dev	1.38	Std. Dev	.97
Median	1.50	Median	2.42
Range	-3 to +3	Range	-3 to 3
Injunctive norms		**Self-Efficacy**	
Sun protection (n=187)		***Sun protection (n=187)***	
Cronbach's Alpha.	.87	Cronbach's Alpha.	.88
Mean	.56	Mean	1.57
Std. Dev	1.57	Std. Dev	1.47
Median	.60	Median	2.00
Range	-3 to +3	Range	-3 to 3
Nutrition (n=194)		***Nutrition (n=194)***	
Cronbach's Alpha.	.83	Cronbach's Alpha.	.84
Mean	1.69	Mean	2.17
Std. Dev	1.16	Std. Dev	1.09
Median	1.75	Median	2.50
Range	-3 to +3	Range	-3 to 3

Please note that the distribution for the Integrative Model measures for the first part of the pilot study (July 2009) is provided in Table 2.6 (section 2.3.4.3).

2.6.4 Analytic approach

A preliminary test of hypotheses relating to the interaction between observability and (descriptive and injunctive) social norms was carried out using the additional sample of participants. The combined sample (N=381) included participants assigned to the playground scenario (i.e. scenario 1) or the play date scenario (i.e. scenario 3) in the July 2009 pilot test (n=155), as well as the additional sample recruited in September 2009 (n=226). These tests were not intended to be definitive tests of these hypotheses, but it was hoped that the results would be in the anticipated direction[5].

Hypothesis 1a (see Chapter 1 for theoretical background related to these hypotheses) was tested using an estimating equation which includes the main effects for descriptive norms, main effects for observability of behavior, and the interactions between descriptive norms and the observability of the behavior, compared with the non-observable condition. For hypothesis 1a to be supported, the interaction between descriptive norms and the observability of the behavioral scenario had to be positive and significant (*Descriptive norms*Observable)*. In addition, the interaction between attitudes and the observable behavior scenario (*Attitudes *Observable)* had to be non-significant:

[5] The conclusive tests of Hypothesis 1a and Hypothesis 1b were carried out among the sample of parents in the major study and will be described in Chapter 4 (study 2).

Hypothesis 1a: Intention to perform health behaviors for one's child should be more associated with descriptive norms among parents who are told that their behavior is observable by other parents (vs. not observable).

Intentions= f(Descriptive norms, Attitudes, Observable vs. not, Descriptive norms*Observable)

Similarly, Hypothesis 1b uses an estimating equation which includes the main effects for injunctive norms, main effects for observability of behavior, and the interactions between injunctive norms and the observability of the behavior, compared with the non-observable condition. For hypothesis 1b to be supported, the interaction between injunctive norms and the observability of the behavioral scenario had to be positive and significant (*Injunctive norms*Observable)*. In addition, the interaction between attitudes and the observable behavior scenario (*Attitudes *Observable)* had to be non-significant:

Hypothesis 1b: Intention to perform health behaviors for one's child) should be more associated with injunctive norms among parents who are told that their behavior is observable by other parents (vs. not observable).

Intentions= f(Injunctive norms, Attitudes, Observable vs. not, Injunctive norms*Observable)

2.7 Results

Sun protection (playground scenario)

Table 2.23 shows the results of an OLS regression model using the sample of parents who participated in the on-line survey relating to sun protection (n=187). The model predicts intention to practice sun protection behaviors in the playground scenario and tests the effects of observability and descriptive norms and the interaction between these variables (H1a). The results show a positive main effect of descriptive norms for sun protection on intention (B = .91, β = .64, p<.001). There was a significant positive main effect of the observability of behavior on intention (B = .81, β = .18, p<.01). The results point to a negative joint effect of observability of the behavioral scenario and self-reported descriptive norms regarding sun protection for one's child. However, the effect size is modest and is not statistically significant (p=.362).

Table 2.23 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=187)

Variable	B	SE	β	p value
Descriptive norms (sun protection)	.91	.12	.64	<.001
Observable behavioral scenario (Yes=1, No=0)	.81	.28	.18	.004
Descriptive norms * Observable	-.15	.17	-.08[6]	.362
R^2 (adj.) %	**35.6%**			

Note. B = unstandardized coefficient; β= standardized coefficient.

Table 2.24 shows the results of an OLS regression model among parents in the survey relating to sun protection (n=187). The model predicts intention to practice sun protection behaviors in the playground scenario and tests the effects of observability and injunctive norms and the interaction between these variables (H1b). The results show a positive main effect of injunctive norms for sun protection on intention (B =1.04, β =.72, p<.001). There was a significant positive main effect of the observability of behavior on intention (B = .63, β = .24, p<.05). The results did not show a significant joint effect of observability of the behavioral scenario and self-reported injunctive norms regarding sun protection for one's child (p=.784).

[6] A test of H1a among participants recruited in the July 2009 sample (n=70) showed a positive joint effect of descriptive norms and observability (B=.47, SE=.30, β=.20, p=.12). This effect was not significant but was in the expected direction, in contrast to the results observed for the pooled sample of participants from July who were combined together with the additional sample recruited in September.

Table 2.24 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=187)

Variable	B	SE	β	p value
Injunctive norms (sun protection)	1.04	.10	.72	<.001
Observable behavioral scenario (Yes=1, No=0)	.63	.24	.14	.010
Injunctive norms * Observable	-.04	.15	-.02[7]	.784
R^2 (adj.) %	**51.9%**			

Note. B = unstandardized coefficient; β= standardized coefficient.

Nutrition (play date scenario)

Table 2.25 shows the results of an OLS regression model using the sample of parents who participated in the on-line survey relating to nutrition (n=194). The model predicts intention to serve one's child healthy food in the play date scenario and tests the effects of observability and descriptive norms and the interaction between these variables (H1a). The results show a positive main effect of descriptive norms for healthy foods on intention (B = .67, β = .53, p<.001). There was no main effect of the observability of behavior on intention (p > .05). There was also no significant joint effect of observability

[7] A test of H1b among participants recruited in the July 2009 sample (n=70) showed a (positive joint effect of injunctive norms and observability (B=.33, SE=.24, β=.16, p=.17). This effect was not significant but was in the expected direction, in contrast to the results observed for the pooled sample of participants from July who were combined together with the additional sample recruited in September

of the behavioral scenario and self-reported descriptive norms regarding healthy nutrition for one's child.

Table 2.25 Results of OLS regression predicting intention to serve one's child healthy food (n=194)

Variable	B	SE	β	p value
Descriptive norms (nutrition)	.67	.12	.53	<.001
Observable behavioral scenario (Yes=1, No=0)	-.13	.32	-.04	.688
Descriptive norms * Observable	-.19	.17	-.12	.270
R^2 (adj.) %	**22.0%**			

Note. B = unstandardized coefficient; β= standardized coefficient.

Table 2.26 shows the results of an OLS regression model among parents in the survey relating to nutrition (n=194). The model predicts intention to serve one's child healthy food in the play date scenario and tests the effects of observability and injunctive norms and the interaction between these variables (H1b). The results show a positive main effect of injunctive norms for healthy nutrition on intention (B = .40, β = .30, p <.01). There was no significant main effect of the observability of behavior on intention (p>.05). The results point to a negative joint effect of observability of the behavioral scenario and self-reported injunctive norms regarding healthy nutrition for one's child. However, the effect size is modest, and not statistically significant (p=.087).

Table 2.26 Results of OLS regression predicting intention to serve one's child healthy food (n=194)

Variable	B	SE	β	p value
Injunctive norms (healthy food)	.40	.13	.30	.001
Observable behavioral scenario (Yes=1, No=0)	-.28	.27	-.08	.304
Injunctive norms * Observable	-.32	.19	-.17	.087
R^2 (adj.) %	**5.5%**			

Note. B = unstandardized coefficient; β= standardized coefficient.

2.8 Conclusions

The results of the analysis of the additional data collected for the pilot study do not provide evidence to support hypotheses 1a and 1b. Interestingly, though, we do see that observability does have a significant positive main effect on intention to practice sun protection behaviors (but not nutrition) among parents after accounting for the effect of perceived injunctive and descriptive norms. Also of note is the fact that, among the sample of participants recruited in July 2009, preliminary tests of these hypotheses *did* show results that were in the expected direction for participants in the sun protection survey. Taking into account the inconsistent results of the preliminary tests of these hypotheses among the July 2009 and September 2009 sample, it was decided that a definitive test of H1a and H1b would be conducted among the participants recruited for the major dissertation study in December 2009 and January 2010 (the results of this test will be described in Chapter 4).

Other results of the additional data collection in September indicate (see Tables 2.17, 2.18, and 2.19) that the measures for the sample recruited in September 2009 are distributed in a very similar way to the measures in the pilot study (July 2009). In particular the internal consistency of the personality trait scales and the Integrative Model measures is high, and the primary measures which were later used in the major study are well distributed.

CHAPTER 3:

STUDY 2. DECEMBER 2009 AND JANUARY 2010

3.1 Introduction and study purpose

This chapter begins with a description of the major experiment (study 2): procedures for pretesting messages among parents, the sample, the experimental messages, the observability treatment, the message treatment, the measures of the other moderators, the organization of the experiment, and the essential analysis approach for the primary hypotheses. The following chapters (chapter 4, 5, 6 and 7) will describe the results of these tests as they relate to the major questions of the dissertation.

The major dissertation study was an online experiment, in which parents of young children were exposed to a visual plus text messages that either emphasized normative justifications or personal benefit justifications for a specific child protective behavior or they were exposed to no relevant message on the topic. The focus behaviors were either sun protection or nutrition. The on-line experiment was conducted in stages. Data collection for study 2 was carried out in December of 2009 and January of 2010.

The focus of the second study is on the moderators which condition parents' responses to the messages, as described in the hypotheses above. One moderator, observability, was experimentally varied; the others, other directedness and group identification were measured as individual difference variables. The focus outcome

measure for each of the experiments was intention to engage in the behavior recommended by the message. The purpose of the second study was to conduct an essential test of the major hypotheses which examine the interaction between message type and moderators in their joint effects on intentions.

3.2 Pre-test of messages among parents of young children

The message pre-testing stage was a multi-step process in which the messages were tested among small samples from the target population of parents of young children. The pre-testing process applied pre-determined criterion for effectiveness in order to evaluate whether the posters are working as expected. Results of the pre-test helped shape the design of the message which were used in Study 2 (December 2009 and January of 2010).

Procedures – Pre-test

In October and November of 2009 a pre-test of messages to be used in study 2 was carried out among parents of young children at a clinic in Wynnewood, PA (with the permission of the clinic director). Prior to this stage I had photographed two acquaintances who were parents of a young child. The images which were chosen for use in the messages showed the parent demonstrating sun protection and healthy nutrition behaviors for their child. In addition, a first draft of the four messages was prepared at this time (sun protection – attitudinal argument, sun protection – normative argument,

nutrition – attitudinal argument, nutrition – normative argument). The messages incorporated text and two images for each behavior (please see Appendix F for messages).

Interviews were conducted over several hours in the waiting room of the clinic and structured around a questionnaire which included questions which were designed to help focus the parents' responses on the message elements that were most critical for the study (please see Appendix D for the pre-testing questionnaire). In total, 22 parents were interviewed. Interviews were approximately fifteen minutes in duration.

Between each visit to the clinic (visits were approximately two weeks apart) the responses provided by parents were reviewed, and the messages were revised to reflect parents' feedback (please see Appendix E for results for the pre-test). Thus, the process of pre-testing allowed me to improve the messages prior to using them in the on-line survey. Once the messages were revised for the third time I felt confident that they were ready to use in the on-line survey, which was run in December of 2009.

3.3 Methods – Study 2

3.3.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010. Of these, 467 were retained for analysis. The parents ranged in age from 18 to 50 and above (most parents

were aged 30-39). The majority of participants were white (84.4 percent). The sample was 61 percent female. 82.4 percent of the sample were currently married or living with a partner. (Please refer to Table 3.1 and Table 3.2, below, for the demographic and health-related characteristics of the sample.) The study protocol was approved as exempt from review by the University of Pennsylvania's institutional review board.

Table 3.1 Demographic characteristics of sample (N=467)

Demographic Characteristics	*n*	*Percent*
Gender		
Male	182	39
Female	285	61
Education		
Some high school but did not graduate	14	3.0
High school diploma / GED	95	20.3
Some college / 2-year degree	193	41.3
4-year college graduate	112	24.0
More than 4-year college degree	53	11.3
Employment status		
Employed	281	60.2
Not employed	186	39.8
Marital status		
Married or cohabiting	385	82.4
Single	82	17.6
Race/ethnicity		
White	394	84.4
Hispanic / Latino	66	14.1
African-American / Black	42	9
Asian American	18	3.9
Other	27	5.8
Age		
18-29	71	15.2
30-39	164	35.1
40-49	156	33.4
50 or older	76	16.3

Demographic Characteristics	*n*	*Percent*
Children (living at home)		
One	117	25.1
Two	186	39.8
Three	100	21.4
Four	51	10.9
Five or more	13	2.8
Child's gender (child aged 5-9)		
Male	246	52.7
Female	221	47.3
Child's age		
Five	105	22.5
Six	107	22.9
Seven	82	17.6
Eight	85	18.2
Nine	88	18.8
Child's birth order (child aged 5-9)		
Oldest or only child	167	35.8
A younger child with at least one older sibling	287	61.5
A twin or multiple	13	2.8
Child's health		
Fair	20	4.3
Good	155	33.2
Very good	292	62.5

Table 3.2 Health related variables for sample (N=467)

Nutrition variables (n=242)	*n*	*Percent*
Body Mass Index of child		
Underweight (BMI<18)	128	52.9
Normal (BMI = <25.0)	82	33.9
Overweight (BMI = >25 <=30)	23	9.5
Obese (BMI >30)	9	3.7
Parent's perception of child's weight		
Underweight	30	12.4
About average weight	172	71.1
A little overweight	36	14.9
Very overweight	4	1.7
Parent's nutrition behavior	***Mean***	***Std.Dev***
Range (1 to 6), Median = 3.75	3.58 (scale)	1.22 (scale)
o Low fat diet	3.40	1.50
o Low sugar diet	3.39	1.53
o Eat at least 3 servings of fruit per day	3.64	1.48
o Eat at least 3 servings of vegetables per day	3.87	1.49
Sun protection variables (n=225)	***n***	***Percent***
Reaction of child's skin to sun exposure		
Tends to burn easily	38	16.9
Tends to burn at first but then tan	46	20.4
Tends to burn occasionally and tans slowly	46	20.4
Rarely burns and always tans	75	33.3
Never burns and tans quickly	20	8.9
Parent's sun protection behavior	***Mean***	***Std.Dev***
Range (1 through 6), Median = 4	3.94 (scale)	1.11 (scale)
o Regularly applies sunscreen with SPF 15 or higher	3.64	1.71
o Seeks shade	4.48	1.55
o Wears protective clothing	3.44	1.69
o Wear a hat	3.34	1.83
o Wears sunglasses	4.76	1.55

3.3.2 Design

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Each online experiment was conducted employing a 2 (observable / non-observable behavior) x 3 (exposure to normative argument / exposure to attitudinal argument / no message exposure) between-subjects design. Observability of the behavior and message type was experimentally varied. The focus outcome measure for the experiments was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition.

3.3.3 Procedures

After responding to questions about demographic characteristics and personality traits, subjects were either not exposed to a message or exposed to a message which either emphasized a normative justification for a behavior or an attitude-relevant justification for the behavior. If they were in a message condition they were informed that they were going to be shown a message about the importance of ensuring proper nutrition or adequate sun protection for children. Each message, which comprised two screen images, included both written text and a photo of a parent and child modeling healthy nutrition behaviors or sun protection behaviors (a male parent with a child on one screen and a female parent with a child on the next). Subjects were only able to move

from one screen to the next after a delay of 25 seconds, to ensure that they had enough time to attend to all of the message elements.

All three groups, regardless of whether they received a message, were then asked about their behavioral intentions in a relevant scenario. The intentions measure incorporated the second randomized manipulation –with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.)

For each of the behavior types (nutrition and sun protection) the normatively focused message and attitudinally focused messages had identical layout and images. While much of the written text in each message type was the same for each behavior type, the messages varied in their emphasis on either the expectations by others of the parent to perform the recommended healthy behavior (i.e. normatively focused message) or on the health benefits of performing the recommended behavior (i.e. attitudinally focused message). Please see the messages in Appendix (see Appendix F).

Following exposure to the message, for each of the behavior types (nutrition or sun protection), participants in the message conditions (and subjects in the non-message conditions who had completed the questions relating to personality traits) were randomly assigned to an intentions measure with either an observable (others present) or a non-observable (others not present) behavioral scenario as described above matched to that behavior type. Once they had responded to questions measuring intention related to the

behavioral scenario (i.e. the outcome measure), all subjects were given a manipulation check for the observability manipulation. All subjects then responded to questions about attitudes, injunctive and descriptive norms and self-efficacy beliefs relating to providing healthy foods to or engaging in sun-protection behaviors for their child. Finally, subjects in all of the groups who had been shown a message were given a manipulation check for the message type manipulation. The complete questionnaire for Study 2 is provided in Appendix (see Appendix G). Table 3.3 provides information about the distribution of participants in each of the message and observability conditions for study 2.

Table 3.3 Message conditions (N=467)

Message conditions	n	Percent
Sun protection:		
Attitudinal message	73	15.6
Normative message	77	16.5
No message	75	16.1
Nutrition:		
Attitudinal message	79	16.9
Normative message	80	17.1
No message	83	17.8
Observability conditions	**n**	**Percent**
***Sun protection (n=225)*:**		
Observable	113	24.2
Not observable	112	24.0
Nutrition (n=242):		
Observable	124	25.6
Not observable	118	25.2

3.3.4 Measures

3.3.4.1 Measures: Personality traits

Below are descriptions of the personality trait measures. These measures were also used in the pilot study (see section 2.3.4.1 for further information about the trait measures). The section below will describe the trait measures which were used in Study

2. Information about the distribution and internal consistency of these measures is provided in Table 3.4 (after the descriptions below).

Other-directedness

Subjects were asked to indicate the strength of their agreement with each of the eleven statements (below), using a 5-point Likert scale in which 5 = Strongly agree; 4 = Agree; 3 = Neither agree nor disagree; 2 = Disagree; and 1 = Strongly disagree.

1. *In different situations and with different people, I often act like very different persons*
2. *In order to get along and be liked, I tend to be what people expect me to be rather than anything else*
3. *I am not always the person I appear to be*
4. *I guess I put on a show to impress or entertain people*
5. *Even if I am not enjoying myself, I often pretend to be having a good time*
6. *I may deceive people by being friendly when I really dislike them*
7. *I would not change my opinions (or the way I do things) in order to please someone or win their favor (Reverse coded)*
8. *I feel a bit awkward in company and do not show up quite as well as I should (Reverse coded)*
9. *When I am uncertain how to act in social situations, I look to the behavior of others for cues*

10. *My behavior is usually an expression of my true inner feelings, attitudes, and beliefs (Reverse coded)*
11. *At parties and social gatherings, I do not attempt to do or say things that other will like (Reverse coded)*

In an examination of the scale items used in study 2, 8 out of the 11 items in the other-directedness scale were shown to have good internal consistency with one another (Cronbach's alpha for these 8 items was 0.85). Statements 7, 8, and 11 (see above) were not included in the final scale for study 2 as they had poor internal consistency with the other items[8]. These three items were also reverse coded, which may suggest that participants did not pay close enough attention to the items and the response options. Responses to the 8-item other-directedness scale were summed when a higher score indicates higher other-directedness (Mean=20.18, Median=20, SD=6.58, range: 8-40). This scale was then mean centered to reduce multicollinearity in the regression analysis. A trichotomous version of this scale was also created with the goal of creating three equal sized categories (low, moderate, and high levels of the trait).

Among parents in the sun protection group, 66 subjects (29.3 percent) are categorized as low in other-directedness, 83 are moderate in other-directedness (36.9 percent), and 76 are high in other-directedness (33.8 percent). Among parents in the

[8] The corrected item-total correlation was less than 0.3 for these three items, but 0.5 or higher for the other 8 items. Cronbach's alpha also increased from .78 to .85 when these items were excluded.

nutrition sample, 82 subjects (33.9 percent) are categorized as low in other directedness, 88 are moderate in other-directedness (36.4 percent) and 72 are high in other-directedness (29.8 percent).

Private Self-consciousness

Subjects were asked to indicate the extent to which the following statements are accurate descriptions of themselves on a scale in which 3 = 'A lot like me'; 2 = 'Somewhat like me'; 1 = 'A little like me'; and 0 = 'Not at all like me'.

1. *I'm always trying to figure myself out*
2. *I never take a hard look at myself (Reverse coded)*
3. *I often daydream about myself*
4. *I'm constantly thinking about my reasons for doing things*
5. *I generally pay attention to my inner feelings*
6. *I sometimes step back (in my mind) in order to examine myself from a distance*
7. *I'm quick to notice changes in my mood*
8. *I know the way my mind works when I work through a problem*
9. *I think about myself a lot*

8 out of the 9 items in the private self-consciousness scale were shown to have good internal consistency with one another (Cronbach's alpha for these 8 items was 0.81). Item 2 (see statement 2 above) was excluded from the final scale as it showed poor

internal consistency with the other 8 items[9]. Responses to the 8-item Private Self-Consciousness scale were summed when a higher score indicates higher reported greater self-consciousness (Mean=12.63, Median=12.0, SD=5.1, range: 0-24). This scale was also mean centered to reduce multicollinearity in the regression analysis. A trichotomous version of this scale was also created with the goal of creating three equal sized categories (low, moderate, and high levels of the trait).

Among the sun protection group, 72 subjects (32 percent are categorized as low in self-consciousness, 69 are moderate in self-consciousness (30.7 percent), and 84 are high in self-consciousness (37.3 percent). Among the nutrition sample, 84 subjects (34.7 percent) are categorized as low in self-consciousness, 78 are moderate in self-consciousness (32.2 percent), and 80 are high in self-consciousness (33.1 percent).

Perceived group identification

Responses to the 6-item perceived group identification scale were summed when a higher score indicates higher reported identification with other parents (Mean=18.77, SD=5.02, Median=18, range: 6-30). The scale showed a high internal consistency (Cronbach's alpha was 0.91 for all 6 items). The final scale includes all 6 items. A dichotomous version of this scale was also created to create two equal sized categories, using a median split (at the value of 18.5). Among parents in the nutrition sample, 125 subjects (51.7 percent) were categorized as having low identification with other parents

[9] The corrected item-total correlation was -.03 for the excluded item, but 0.36 or higher for the other 8 items. Cronbach's alpha also increased from .76 to .81 when the item was excluded.

and 117 (48.3 percent) as having high identification with other parents. Among parents in the sun protection sample, 104 subjects (46.2 percent) were categorized as having low identification and 121 subjects (53.8 percent) were categorized as having high identification with other parents.

Information about the personality trait measures, their internal consistency, and their distribution is provided below (see Table 3.4).

Table 3.4 Personality trait variables (N=467)

Other-Directedness	***Mean***	***Std.Dev***	**Other-Directedness**	**n**	**Percent**
Range (8 - 40)	20.18	6.58	Low	148	31.7
Median	20.0		Moderate	171	36.6
Cronbach's Alpha = 0.85			High	148	31.7
Skewness	.33				
Kurtosis	-.32				
Private Self-Consciousness	***Mean***	***Std.Dev***	**Private Self-Consciousness**		
Range (0 - 24)	12.63	5.1	Low	156	33.4
Median	12.0		Moderate	147	31.5
Cronbach's Alpha = 0.81			High	164	35.1
Skewness	.01				
Kurtosis	-.34				
Perceived Group Identification	***Mean***	***Std.Dev***	**Perceived Group Identification**	**n**	**Percent**
Range (6 through 30)	18.77	5.02	Low	229	49.0
Median	18.0		High	238	51.0
Cronbach's Alpha = 0.91					
Skewness	-.11				
Kurtosis	-.22				

3.3.4.2 Measures: Dependent variables

The intention measure for study 1 and study 2 incorporate the observability manipulation. A description of the intention measures is provided in the previous chapter (see section 2.3.4.2). The distribution and internal consistency of the dependent variables in Study 2 and the Integrative model variables is also listed in Table 3.5 after the description of the measures.

Nutrition

Dependent Variable: Intention to serve one's child healthy foods

Factor analysis of the nutrition items (please see section 2.3.4.2 for details about this measure) was conducted to determine how the items grouped into sub-components. The (varimax) rotated component matrix indicated that there were three principal components which had eigenvalues greater than 1, but one of the components included four foods that could be considered healthy. This component included water, fruit, vegetables, and milk. Responses to these four items were averaged to form a continuous measure for intention (Cronbach's alpha = 0.60). The intention measure for nutrition ranged from 3.75 to 9 (Mean=7.05, SD=1.47, Media=7.25).

Sun protection

Dependent Variable: Intention to practice sun protection behaviors for one's child

Participants assigned to the sun protection survey were asked about five sun protection behaviors (please see section 2.3.4.2 for a description of this measure). Responses to these five items were averaged to form a continuous measure for intention to protect one's child from the sun (Cronbach's alpha = 0.89). The intention measure for sun protection ranged from 1 to 10 (Mean=6.96, SD=1.91, Median= 7.0).

Table 3.5 (below) provides additional information about the distribution and internal consistency of the dependent variables in study 2.

Table 3.5 Dependent variables (Behavioral Intention) Study 2 (N=467)

Sun protection (n=225)		***Nutrition (n=242)***	
Mean	6.96	Mean	7.05
Std. Dev	1.91	Std. Dev	1.47
Median	7.0	Median	7.25
Cronbach's Alpha.	0.89	Cronbach's Alpha.	0.60
Skewness	-.20	Skewness	-.31
Kurtosis	-.78	Kurtosis	-1.0
Range	2.6 – 10.0	Range	3.75 – 9.0

3.3.4.3 Measures: Integrative Model variables

A description of the measures of attitudes, descriptive and injunctive norms, and self-efficacy for the nutrition survey and the sun protection survey separately is provided in section 2.3.4.3[10]. Information about these measures and their distribution is also listed in Table 3.6 (below).

[10] All measures described here were mean centered to reduce multicollinearity in the regression analysis.

Table 3.6 Integrative Model variables (N=467)

Descriptive norms		**Descriptive norms**		
Sun protection (n=225)	Range = -3 to 3	***Sun protection (n=225)***	**n**	**Percent**
Mean	0.81	Low	75	33.3
Std. Dev	1.46	Moderate	72	32.0
Median	1.00	High	78	34.7
Cronbach's Alpha.	0.89			
Nutrition (n=242)	Range = -3 to 3	***Nutrition (n=242)***	**n**	**Percent**
Mean	1.49	Low	70	28.9
Std. Dev	1.15	Moderate	93	38.4
Median	1.50	High	79	32.6
Cronbach's Alpha.	0.77			
Injunctive norms		**Injunctive norms**		
Sun protection (n=225)	Range = -3 to 3	***Sun protection (n=225)***	**n**	**Percent**
Mean	1.04	Low	68	30.2
Std. Dev	135	Moderate	78	34.7
Median	1.00	High	79	35.1
Cronbach's Alpha.	0.86			
Nutrition (n=242)	Range = -3 to 3	***Nutrition (n=242)***	**n**	**Percent**
Mean	1.73	Low	76	31.4
Std. Dev	1.19	Moderate	78	32.2
Median	2.00	High	88	36.4
Cronbach's Alpha.	0.82			

Attitudes		**Attitudes**		
Sun protection (n=225)	Range = -3 to 3	***Sun protection (n=225)***	**n**	**Percent**
Mean	1.55	Low	74	32.9
Std. Dev	1.05	Moderate	68	30.2
Median	1.73	High	83	36.9
Cronbach's Alpha.	0.81			
Nutrition (n=242)	Range = -3 to 3	***Nutrition (n=242)***	**n**	**Percent**
Mean	1.80	Low	74	30.6
Std. Dev	0.97	Moderate	80	33.1
Median	2.00	High	88	36.3
Cronbach's Alpha.	0.67			
Self-Efficacy		**Self-Efficacy**		
Sun protection (n=225)	Range = -3 to 3	***Sun protection (n=225)***	**n**	**Percent**
Mean	1.70	Low	77	34.2
Std. Dev	1.21	Moderate	73	32.4
Median	2.00	High	75	33.3
Cronbach's Alpha.	0.83			
Nutrition (n=242)	Range = -3 to 3	***Nutrition (n=242)***	**n**	**Percent**
Mean	2.25	Low	69	28.5
Std. Dev	0.94	Moderate	66	27.3
Median	2.63	High	107	44.2
Cronbach's Alpha.	0.79			

3.3.4.4 Other measures

The measures below were included as covariates in tests of the hypotheses to be described in the next chapters.

A measure of parent's (own) nutritional behaviors was obtained by asking subjects to indicate the strength of their agreement with each of four items, using a using a 6-point Likert scale in which 6= Strongly agree, and 1=Strongly disagree. The items included '*I eat a low fat diet*', '*I eat a low sugar diet'*, '*I eat at least three servings of fruit per day'*, and '*I eat at least 3 servings of vegetables per day*'. The mean response to these four items was calculated to create a measure of parent's nutritional behaviors (Mean=3.58, SD=1.22), which was included as a covariate in analysis. Table 3.2 provides additional information about this measure.

Similarly, a variable measuring parent's (own) reported sun protection behaviors was obtained by asking subjects to indicate the strength of their agreement with each of five items, using a using a 6-point Likert scale in which 6= Strongly agree, and 1=Strongly disagree. The items were matched to the five sun protection behaviors used in the intention measure (see above). The mean response to these five items was calculated to create a measure of parent's own sun protection behaviors (Mean=3.94, SD=1.11). Table 3.2 provides additional information about this measure.

In addition, other covariates in analyses include parents' race (White vs. Other), and the number of children living at the subject's home (1= one child; 2= 2 children; 3 =

3 or more children). Table 3.1 provides additional information about the distribution of these variables.

3.4 Analytic approach

In study 2 the hypotheses outlined in chapter 1 were tested using estimating equations (see hypotheses for equations). Each of the estimating equations includes main effects for norms and attitudes, main effects for two of the three message conditions (norm and attitude), main effects for observability of behavior, and interactions specific to each hypothesis.

The hypothesis are considered to be supported if the coefficients for the interaction terms of interest are significantly different (and in the expected direction) from the control group (no message condition). Each hypothesis also specifies interactions which were expected to be non-significant, compared with the control group. In each case the objective was to test the difference between the interaction of focus in the hypothesis and the interaction between no message and the third factor. Tests of these hypotheses and the results are described in chapters 4, 5, 6, and 7.

CHAPTER 4:

OBSERVABILITY OF BEHAVIOR AND THE NORMATIVE ROUTE TO INTENTION

4.1 Introduction

This chapter applies the Integrative Model of Behavior Change (Fishbein, 2000; Fishbein et al., 2002; Fishbein and Ajzen 2010) to predict two types of health behaviors among parents of young children – nutritional choices and sun protection. The objective is to demonstrate the extent to which the model accounts for variation in intention. Following this, the next step describes a test of the influence of the public/private nature of the behavior on the effects of social norms on intention. This stage aims to demonstrate whether the presence of another parent in the same behavioral scenario influences the norm-intention association (i.e. through priming the effect of social norms on intention).

Application of the Integrative Model of Behavior change

To predicting sun protection and nutrition behaviors among parents of young children

4.2 Introduction

This section describes the results of OLS regression models which apply the Integrative Model of Behavior Change (Fishbein, 2000; Fishbein et al., 2002; Fishbein and Ajzen 2010) to predict intention to perform health behaviors (sun protection and nutrition) among parents of young children. The model has been described previously (please refer to Chapter 1). In accordance with the model, analyses presented here will illustrate the extent to which attitudes, norms (injunctive and descriptive) and self-efficacy account for variance in behavioral intention among parents of young children.

4.3 Method

4.3.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010. Of these, 467 were retained for analysis. The unweighted demographic characteristics of the sample were presented in Table 3.1

4.3.2 Design and procedures

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design (3.3.2) of the studies, the procedures (3.3.3), and the measures (3.3.4).

4.3.3 Analytic approach

The application of the Integrative model was conducted among parents in the nutrition-related and the sun protection-related surveys (separately) using ordinary least squares regression analysis to predict intention. The first models include the main effects for descriptive norms, main effects for injunctive norms, main effects for attitudes, and main effects for self-efficacy

4.4 Results

The results are organized in terms of two sections. The first section describes the application of the Integrative Model (IM) among parents who were surveyed about sun protection for their child (n=225), and the second section describes its application among parents who were surveyed about nutrition behaviors for their child (n=242).

Table 4.1 shows the results of an OLS regression model using the sample of parents who participated in the on-line survey relating to sun protection (n=225). The results show a significant positive main effect of injunctive norms (B =.64, β=.45,

p<0.001) and attitudes toward sun protection (B =.67, β=.37, p<0.001) on intention. Descriptive norms and self-efficacy were not associated with intention (p>.05). In this model, IM factors accounted for 57.8% (adjusted R square) of the variance in intention to perform sun protection behaviors among parents of young children.

Table 4.1 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.64	.09	.45***
Descriptive norms (sun protection)	.00	.08	.00
Attitudes (sun protection)	.67	.11	.37***
Self-Efficacy (sun protection)	.09	.09	.06
R^2 (adj.) %	**57.8%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 4.2 (below) shows the results of the same OLS model using the stepwise procedure. In this model, descriptive norms and self-efficacy are excluded. Injunctive norms remain a significant predictor of intention (B =.65, β=.46, p<0.001) as do attitudes toward sun protection (B =.73, β=.40, p<0.001). When the non-significant predictors are excluded from the model the total variance explained by the IM is almost identical to the full model – 58% (adjusted R square).

Table 4.2 Results of OLS regression (stepwise) predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.65	.08	.46***
Attitudes (sun protection)	.73	.10	.40***
R^2 (adj.) %	**58.0%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

A secondary analysis was run to test whether a variable which averages the mean scores for descriptive and injunctive norms might be a stronger predictor of behavioral intention than the separate measures. In recent conceptualization of the reasoned action framework, it was suggested (Fishbein & Ajzen, 2010) that perceived normative influence might best be captured through an aggregate of the two underlying type of norms. In the current study, there was, in fact, a high correlation between descriptive norms and injunctive norms for sun protection (R=.71, p<.001), which would suggest that, among this population, there may be substantial overlap between the two types of perceived norms. Consequently, it might be sensible to combine injunctive and descriptive norms to form an overall measure of perceived normative influence. However, it should be noted, that Fishbein & Ajzen's (2010) suggestion to create a combined measure of normative influence is opposed to that taken by theorists such as

Cialdini (1990), who argue for a separation of injunctive and descriptive norms, as each capture a distinct form of normative influence.

Table 4.3 shows the results of an OLS model using the stepwise procedure which includes a combined measure of perceived norms as a predictor of intention. In this model we see that the effect of the combined norms measure on intention is positive, but smaller in size than for injunctive norms alone (B =.34, β=.36, p<0.001). The positive effect of attitudes on intention is increased, compared to the effect in the previous model (B =.86, β=.47, p<0.001). Also of note is the reduction in variance in intention accounted for by this model (52.7%), compared with the models which used the norm variables separately.

Table 4.3 Results of OLS regression (stepwise) predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Overall perceived norms (sun protection)	.34	.05	.36***
Attitudes (sun protection)	.86	.10	.47***
R^2 (adj.) %	**52.7%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 4.4 (below) shows the result of a model applying the IM to predicting behavioral intention to provide healthy foods among parents who were surveyed about nutrition behaviors for their child (n=242). The results show a significant positive main effect of descriptive norms (B =.58, β=.45, p<0.001) and attitudes toward healthy

nutrition (B =.42, β=.28, p<0.001) on intention. Injunctive norms and self-efficacy were not associated with intention (p>.05). In this model, IM factors accounted for 41.9% (adjusted R square) of the variance in intention to provide healthy foods for one's child among parents of young children.

Table 4.4 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Injunctive norms (healthy food)	.06	.08	.05
Descriptive norms (healthy food)	.58	.08	.45***
Attitudes (healthy food)	.42	.10	.28***
Self-Efficacy (healthy foods)	.04	.10	.03
R^2 (adj) %	**41.9%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 4.5 shows the results of the same OLS model using the stepwise procedure. In this model, injunctive norms and self-efficacy are excluded from the model. Descriptive norms remain a significant predictor of intention (B =.62, β=.49, p<0.001) as do attitudes toward sun protection (B =.45, β=.0, p<0.001). When the non-significant predictors from the IM are excluded from the model the total variance explained by the IM is almost identical to the full model (R square= 42.2%).

Table 4.5 Results of OLS regression (stepwise) predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Descriptive norms (healthy food)	.62	.07	.49***
Attitudes (healthy food)	.45	.08	.30***
R^2 (adj) %	**42.2%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 4.6 shows the results of an OLS model predicting intention to serve one's child healthy foods using the stepwise procedure. This model includes a combined measure of perceived norms as a predictor of intention (see above). In this model we see that the effect of norms on intention is positive, but smaller in size than for injunctive norms alone (B =.44, β=.49, p<0.001). The magnitude of the associations are almost identical to the model in which descriptive norms was the only norm variable, which suggests that injunctive norms do not have a main effect on intention among parents in the nutrition sample.

Table 4.6 Results of OLS regression (stepwise) predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Overall perceived norms (healthy food)	.44	.05	.49***
Attitudes (healthy food)	.43	.08	.28***
R^2 (adj) %	41.4%		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Finally, a matrix of bivariate correlations between the Integrative Model elements is displayed below. Table 4.7 presents the correlations for the sun protection survey and Table 4.8 presents the correlations between the IM variables for the nutrition survey.

Table 4.7 Correlations between intentions, attitudes, descriptive norms, injunctive norms, and self-efficacy

Sun protection (n=225)	**1**	**2**	**3**	**4**	**5**
1. Intentions (sun protection)	1	.66***	.52***	.69***	.52***
2. Attitudes (sun protection)	.66***	1	.47***	.57***	.65***
3. Descriptive norms (sun protection)	.52***	.47***	1	.71***	.43***
4. Injunctive norms (sun protection)	.69***	.57***	.71***	1	.50***
5. Self-efficacy (sun protection)	.52***	.65***	.43***	.50***	1

*p < .05, **p < .01, ***p < .001

Table 4.8 Correlations between intentions, attitudes, descriptive norms, injunctive norms, and self-efficacy

Nutrition (n=242)	**1**	**2**	**3**	**4**	**5**
1. Intentions (nutrition)	1	.46***	.59***	.46**8	.37***
2. Attitudes (nutrition)	.46***	1	.33***	.37***	.64***
3. Descriptive norms (nutrition)	.59***	.33***	1	.66***	.34***
4. Injunctive norms (nutrition)	.46***	.37***	.66***	1	.35***
5. Self-efficacy (nutrition)	.37***	.64***	.34***	.35***	1

*p < .05, **p < .01, ***p < .001

4.5 Discussion

The Integrative Model accounted for over half of the total variance in behavioral intention in both of the health behaviors examined, providing further support for its utility in predicting behavior, and health behaviors in particular. Not all of the components in the model, however, were predictive of intention. Parents' attitudes toward the behavior, and their perceived norms were strong predictors of intention. However, for both behaviors self-efficacy was not shown to be associated with intention. This is likely due to the pattern of responses to the self-efficacy variable, which was highly skewed to the left which might be due to the parents' tendency to overestimate their ability to perform these behaviors.

Interestingly, the type of perceived norms which were shown to predict intention differed across the two behavior types. For sun protection behaviors, injunctive norms were strongly associated with intention. For healthy nutrition behaviors, descriptive norms were predictive of intention. This difference might be due to the nature of the behavior or of the specific scenario in which the behavior was described as taking place. For example, parents in the sun protection group were told to imagine themselves in a public setting (a park or playground), and so the expectations of other people in that setting with regard to sun protection behaviors might have been granted greater weight in forming intention. In contrast, in the nutrition scenario, unless they were specifically informed that there was a non-family member in the scenario (some parents were told this in the observable condition), injunctive norms played a non-significant role in the formation of intention, compared with descriptive norms.

However, it is important to note that both types of norms were highly correlated with intention and with each other (please refer to Table 4.7 and Table 4.8 for bivariate correlations). This likely result of this is high collinearity between descriptive and injunctive norms, which makes any conclusions as to their differential normative effects on intention less definite.

Finally, the combined measure of norms was not shown to be a stronger predictor of intention than the separate measures of injunctive or descriptive norms. The magnitude of association with intention and the overall variance explained by the models with the separate norm measures was greater than in the models which used a combined

measure of norms. This would suggest that, for the purpose of applying the IM to predicting these two health behaviors among the population of parents of a young child, it would be preferable to use separate measures of norms, as suggested by Cialdini (1990) and consistent with the current framework of the IM, rather than a combined measure[11].

[11] Given the specific nature of these outcomes and the population, it is not possible to generalize which approach would be preferable for other populations or outcomes.

Examining the interaction between observability and norms in their effect on intention

4.6 Introduction

The previous section of this chapter established that both descriptive and injunctive norms play an important role in predicting two health behaviors among parents of a young child – behaviors related to nutrition, and to sun protection. This section applies the Integrative Model of Behavior Change (Fishbein, 2000; Fishbein et al., 2002; Fishbein & Ajzen, 2010) to test whether the extent to which the same health behavior is enacted in an observable or non-observable setting will lead to variation in normative influence on intention among parents. This process of persuasive change is known as priming, and is based on priming theory, which proposes that persuasive effects can also occur by changing the association between a predictor and its outcome, even when the mean for the predictor remains the same (e.g. Domke, Shah, & Wackman, 1998; Iyengar & Kinder, 1987; Mendelsohn, 1996).

4.7 Hypothesis

It is proposed, based on research reviewed earlier (see Chapter 1), that the presence of referent others (i.e. others parents) will prime descriptive and injunctive norms associated with sun protection among parents of young children. Consequently, among parents who are told that their behavior can be observed by another parent, there should be a greater influence of perceived norms on intention. Parents who report higher levels

of descriptive and injunctive norms are therefore expected to report greater intention to perform health behaviors for their child in a setting in which they are in the company of referent others (i.e. other parents). Among these parents, the observability of their behavior should increase the extent to which the high levels of perceived norms relating to sun protection influence intention to practice these behaviors. For parents with low levels of descriptive or injunctive norms, the presence of another parent in the behavioral scenario should not result in higher intention to practice sun protection behaviors for their child than parents who receive a non-observable scenario.

That intention to perform preventive health behaviors will vary as a function of observability and perceived norms.

Hypothesis 1a: Intention to perform health behaviors for one's child should be more associated with descriptive norms among parents who are told that their behavior is observable by other parents (vs. not observable).

Hypothesis 1b: Intention to perform health behaviors for one's child) should be more associated with injunctive norms among parents who are told that their behavior is observable by other parents (vs. not observable) .

4.8 Method

4.8.1 Sample

The participants of this study and their characteristics are described in Chapter 3 (see Table 3.1 and Table 3.2). The sample used in this analysis included 467 parents of at least one child who was between the ages of five. Participants were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010.

4.8.2 Design and procedures

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design of the studies (3.3.2) and the procedures (3.3.3).

4.8.3 Measures

The analyses presented below used measures that are described in detail in Chapter 3 (see section 3.3.4). For each of the health behaviors, the focus outcome measure was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition. The intentions

measure incorporated the randomized observability manipulation – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) Other measures include attitudes, descriptive norms, injunctive norms, and self-efficacy relating to either sun protection or nutrition.

4.8.4 Analytic approach

Hypotheses 1a and 1b were tested among parents in the nutrition-related and the sun protection-related surveys (separately) using moderated regression analysis to test an estimating equation. Hypothesis 1a was tested using an estimating equation which includes the main effects for descriptive norms, main effects for observability of behavior, and the interactions between descriptive norms and the observability of the behavior, compared with the non-observable condition. Similarly, Hypothesis 1b uses an estimating equation which includes the main effects for injunctive norms, main effects for observability of behavior, and the interactions between injunctive norms and the observability of the behavior, compared with the non-observable condition.

For hypothesis 1a to be supported, the interaction between descriptive norms and the observability of the behavioral scenario had to be positive and significant (*Descriptive norms*Observable)*. In addition, the interaction between attitudes and the observable behavior scenario (*Attitudes *Observable)* had to be non-significant:

Intentions= f(Descriptive norms),Attitudes, Observable vs. not, Descriptive norms*Observable

For hypothesis 1b to be supported, the interaction between injunctive norms and the observability of the behavioral scenario had to be positive and significant (*Injunctive norms*Observable)*. In addition, the interaction between attitudes and the observable behavior scenario (*Attitudes *Observable)* had to be non-significant:

Intentions= f(Injunctive norms),Attitudes, Observable vs. not, Injunctive norms*Observable

4.9 Results

4.9.1 Manipulation check for observability

Two manipulation checks were conducted during the course of the on-line survey, one for the observability manipulation and one for the message type manipulation. The manipulation check for the observability of the behavioral scenario is relevant for the current study. Subjects in the nutrition sample were asked whether, in the (play date) scenario they had read, they were (a) alone (b) with their child only (c) accompanied by another parent or parents. Subjects in the sun protection sample were asked the same question regarding the playground scenario they had received.

Among parents in the nutrition sample, 64 percent of subjects recalled the observability manipulation correctly (66 percent of those in the non-observable condition and 63 percent of those in the observable condition). Among parents in the sun protection sample, 72 percent of subjects recalled the observability manipulation correctly (82.1 percent of those in the non-observable condition and 63 percent of those in the observable condition). Across both samples, 325 parents (69.7 percent of the total sample) correctly recalled the observability manipulation.

4.9.2 Results of hypothesis tests

The results are organized in terms of two sections. Hypotheses 1a and 1b were tested separately among two groups – parents who were surveyed about sun protection for their child (n=225), and parents who were surveyed about nutrition behaviors for their child (n=242).

Table 4.9 shows the results of an OLS regression model using the sample of parents who participated in the on-line survey relating to sun protection (n=225). The model predicts intention to practice sun protection behaviors in the playground scenario and tests the effects of observability and descriptive norms and the interaction between these variables (H1a). The results show a significant positive main effect of descriptive norms for sun protection on intention ($B = .48$, $\beta = .37$, $p<.001$). There was no significant main effect of the observability of behavior on intention ($p>.05$). Most central to the purpose of this study was the observation of a statistically significant interaction

between observability of the behavioral scenario and self-reported descriptive norms regarding sun protection for one's child. As predicted, there was a positive joint effect of observability of the behavioral scenario and descriptive norms on intention to practice sun protection behaviors for one's child (B = .33, β = .19, p<.05). Thus, H1a was supported among the sample of parents in the sun protection group.

Table 4.9 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Descriptive norms (sun protection)	.48	.12	.37***
Observable behavioral scenario (Yes=1, No=0)	-.17	.22	-.05
Descriptive norms * Observable	.33	.15	.19*
R^2 (adj.) %	**27.2%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Figure 4.1 (below) illustrates the observed interaction between descriptive norms and observability. The association between descriptive norms and behavioral intention is stronger among parents in the observable condition compared with parents in the non-observable condition. Specifically, parents who reported low levels of descriptive norms are shown to report reduced intention to perform sun protection behaviors under conditions of observability. In contrast, parents who report high levels of descriptive norms report greater intention to practice these behaviors.

Figure 4.1
Estimated marginal means (observed) – Intention to protect one's child from the effects of exposure to the sun x observability of behavior x descriptive norms for sun protection (n=225)

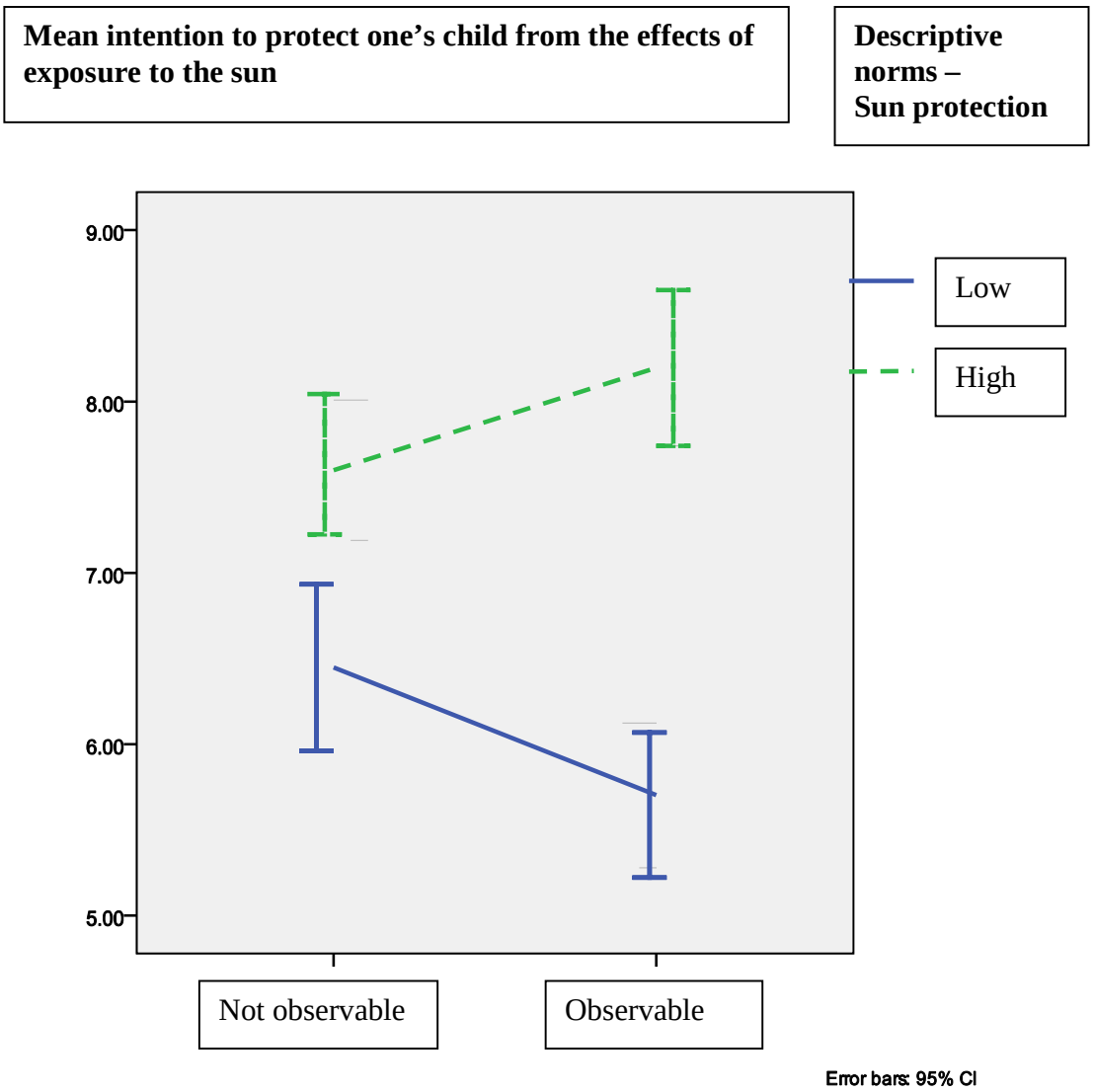


Table 4.10 shows the results of an OLS regression model among parents in the survey relating to sun protection (n=225). The model predicts intention to practice sun protection behaviors in the playground scenario and tests the effects of observability and injunctive norms and the interaction between these variables (H1b). In this model we see a strong positive main effect of injunctive norms related to sun protection on intention (B = .88, β = .60, p<.001). There is no significant main effect of observability of behavior on intention (p>.05). We do see a positive joint effect of observability and injunctive norms on intention, but this effect is not significant (B = .22, β =.13, p>.05).

Table 4.10 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.88	.11	.60***
Observable behavioral scenario (Yes=1, No=0)	-.48	.24	-.12
Injunctive norms * Observable	.22	.15	.13
R^2 (adj.) %	**47.5%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 4.11 shows the results of a post hoc examination of the H1b among parents in the sun protection survey using a categorical version of the injunctive norm variable (rather than the continuous version which was used in the previous model – see Table 4.10). The rationale for conducting this secondary analysis was to determine whether the

effects of observability on intention might vary between parents who can be categorized as low, moderate or high in self-reported injunctive norms related to sun protection. In Table 4.11 we see positive and significant main effects of moderate (B = 1.21, β = .30, p<.01) and high (B = 2.43, β = .61, p<.001) levels of injunctive norms on intention, compared with low levels of injunctive norms. There is no significant main effect of observability (p>.05). In this model we do see a significant positive effect of high levels of injunctive norms on intention, compared with low levels of injunctive norms (B = 1.11, β = .23, p<.05). The joint effects of moderate levels of injunctive norms and observability of the behavioral scenario were not significant (p>.05). Thus, the post hoc analysis lends partial support to H1b among parents in the sun protection survey.

Table 4.11 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection) – Moderate (vs. Low)	1.21	.35	.30**
Injunctive norms (sun protection) – High (vs. Low)	2.43	.36	.61***
Observable behavioral scenario (Yes=1, No=0)	-.58	.36	-.15
Injunctive norms – Moderate (vs. Low) * Observable	.11	.48	.02
Injunctive norms – High (vs. Low) * Observable	1.11	.48	.23*
R^2 (adj.) %	**42.4%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Figure 4.2 illustrates the results of the post hoc analyses testing H1b among parents in the sun protection survey. We see a similar pattern to that observed in Figure 4.1 (H1a). Among parents who report high levels of injunctive norms observability of their behavior increases intention, whereas among parents with low levels of injunctive norms observability decreases intention. Parents with moderate levels of injunctive norms do not show significant differences in intention across observable and non-observable conditions.

Figure 4.2 Estimated marginal means (observed) - Intention to protect one's child from the effects of exposure to the sun x observability of behavior x injunctive norms for sun protection (n=225)

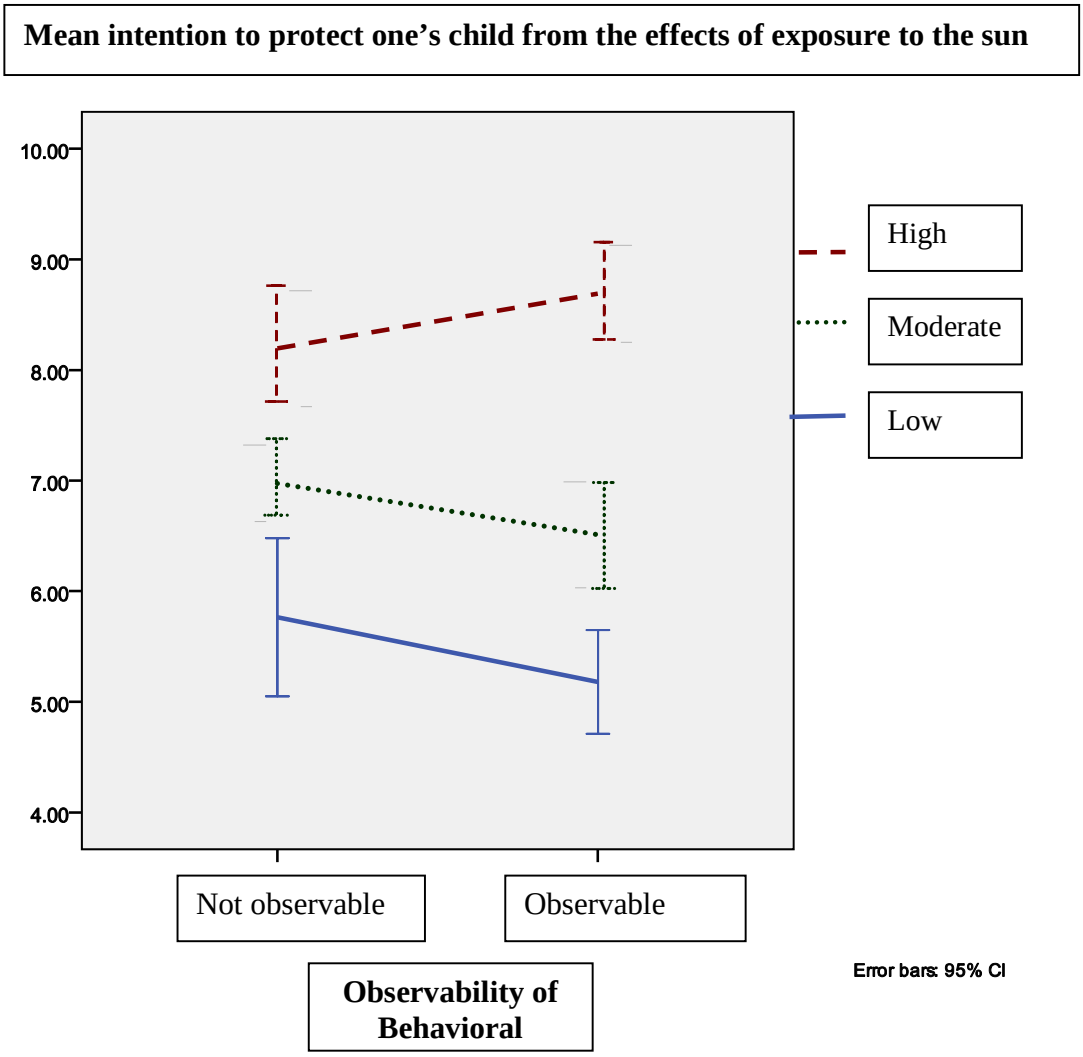


Table 4.12 shows the results of an OLS regression model using the sample of parents who were surveyed about nutrition behaviors for their child (n=242). The model examines the joint effects of observability and self-reported descriptive norms (H1a). We

see a significant main effect of descriptive norms on intention (B = 0.64, β = .51, p<.001). There is no main effect of observability on intention (p>.05). The model does not show a significant joint effect of descriptive norms and observability of the behavioral scenario on intention.

Table 4.12 Results of OLS regression predicting intention to serve one's child healthy food among parents (n=242)

Variable	B	SE	β
Descriptive norms (nutrition)	.64	.09	.51***
Observable behavioral scenario (Yes=1, No=0)	-.04	.15	-.01
Descriptive norms * Observable	.20	.13	.12
R^2 (adj.) %	**34.4%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Results of a post hoc examination of H1a among parents in the nutrition survey using a categorical version of the descriptive norm variable rather than the continuous version which was used in the previous model are shown in Table 4.13. As in the previous secondary analysis, this step was undertaken in order to determine whether the effects of observability on intention might vary between parents who can be categorized as low, moderate or high in self-reported descriptive norms related to nutrition. In Table 4.13 we do not see a significant effect of moderate levels of self-reported descriptive norms on intention, compared with low levels (p>.05). However, we do see a positive

effect of high levels of descriptive norms (vs. low) on intention (B = 2.04, β = .65, p<.001). There is no significant main effect of observability (p>.05). The results show a significant positive effect of moderate levels of descriptive norms on intention, compared with low levels of descriptive norms (B = 1.05, β = .28, p<.01). However, the joint effects of high levels of descriptive norms and observability of the behavioral scenario were not significant (p>.05). Thus, the post hoc analysis lends partial support to H1a among parents in the nutrition survey.

Table 4.13 Results of OLS regression predicting intention to serve one's child healthy food among parents (n=242)

Variable	B	SE	β
Descriptive norms (nutrition) – Moderate (vs. Low)	.33	.26	.11
Descriptive norms (nutrition) – High (vs. Low)	2.04	.27	.65***
Observable behavioral scenario (Yes=1, No=0)	-.53	.28	-.18
Descriptive norms – Moderate (vs. Low) *Observable	1.05	.37	.28**
Descriptive norms – High (vs. Low) * Observable	.38	.38	.10
R^2 (adj.) %	**38.4%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Figure 4.3 illustrates the results of the post hoc analyses for H1a among parents in the nutrition survey. Interestingly, in contrast to the post hoc results shown in Figure 4.2,

the joint effects of observability and descriptive norms are evident when comparing parents who report *low* compared with *moderate* levels of descriptive norms. Among parents who report moderate levels of descriptive norms the observability of their behavior increases intention, whereas among parents with low levels of descriptive norms observability decreases intention. Parents with high levels of injunctive norms do not show significant differences in intention across observable and non-observable conditions.

Figure 4.3
Estimated marginal means (observed) – Intention to serve one's child healthy foods x descriptive norms for nutrition (n=242)

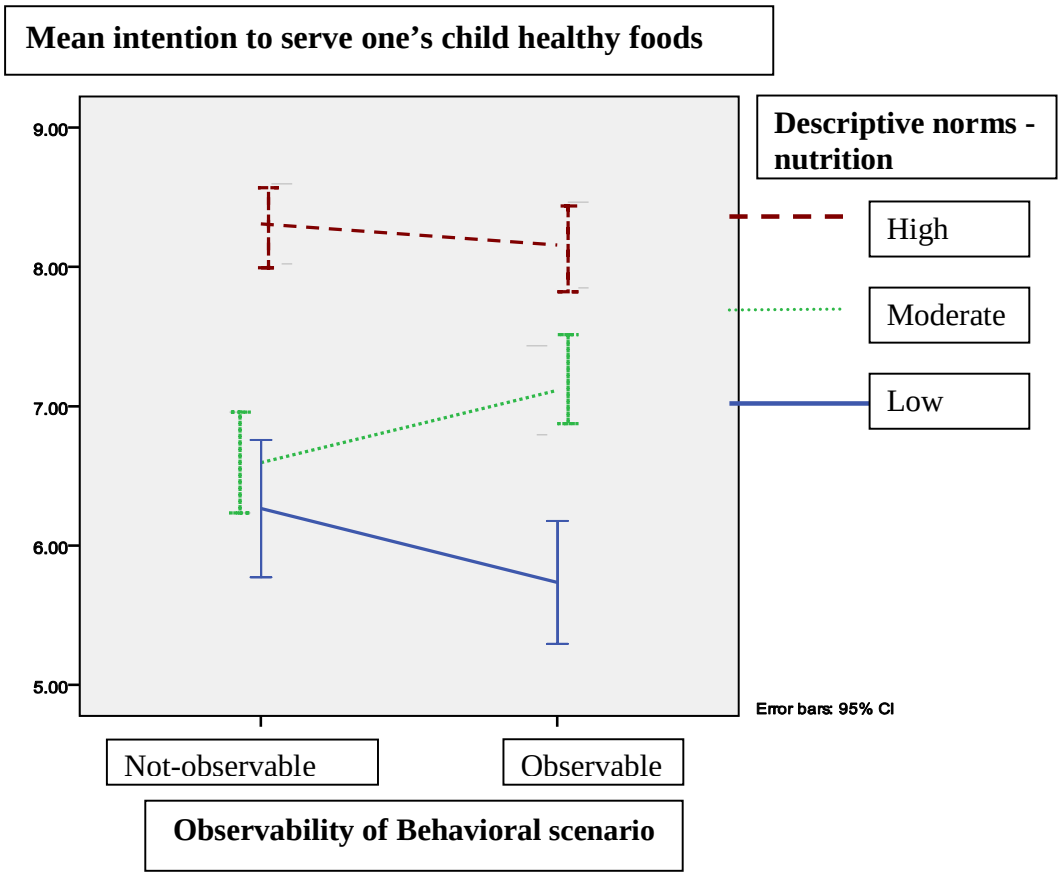


Table 4.14 shows the results of an OLS regression model testing H1b among parents in the nutrition-related survey. We see a significant positive main effect of injunctive norms on intention to serve one's child healthy food (B = 0.50, β = .41, p<.001). There is no significant main effect of observability. There is also no joint effect of observability and injunctive norms among this group (B = 0.13, β = .08, p>.05). Thus, H1b was not supported among parents in the nutrition survey.

Table 4.14 Results of OLS regression predicting intention to serve one's child healthy food among parents (n=242)

Variable	B	SE	β
Injunctive norms (nutrition)	.50	.10	.41***
Observable behavioral scenario (Yes=1, No=0)	-.01	.17	.00
Injunctive norms * Observable	.13	.14	.08
R^2 (adj.) %	**20.6%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

An additional test was carried out to determine whether observability of the behavioral scenario interacted with attitudes and self-efficacy related to the two health behaviors. These variables represent factors underlying behavioral intention which should *not* be expected to interact with the observability of the behavioral scenario, unlike descriptive and injunctive norms. The joint effects of observability and attitudes as well as observability and self-efficacy were examined (in separate models) among the

sun protection and nutrition groups. As expected, among parents who received the sun protection survey, there was no significant joint effect of observability and attitudes (B = 0.248, β = .10, p >.05) or observability and self-efficacy (B = 0.248, β = .10, p >.05) on intention. Likewise, among parents assigned to the nutrition survey, there were no significant effects of the interaction between attitudes and observability (B = 0.130, β = .06, p >.05) or self-efficacy and observability (B = 0.09, β = .04, p >.05) on intention.

It should also be noted that there were no overall differences in means for descriptive norms or for injunctive norms among parents in observable and non-observable conditions (see Table 4.15 below for overall means for these variables).

Table 4.15 Means (observed) for Injunctive and Descriptive Norms for Observable / Not observable groups (N=467)

	Observable Mean, (SD)	**Not observable** Mean, (SD)	**p**
Descriptive norms- sun protection (n=225)	.76 (1.59)	.86 (1.32)	>.05
Injunctive norms - sun protection (n=225)	.99 (1.48)	1.09 (1.21)	>.05
Descriptive norms – nutrition (n=242)	1.48 (1.15)	1.50 (1.17)	>.05
Injunctive norms – nutrition (n=242)	1.70 (1.21)	1.76 (1.17)	>.05

Consequently, in spite of the fact that norms were measured after subjects had received the behavioral scenario (i.e. intention measure), observability did not have an overall effect on norms. Therefore, the results of the current study are comparable to a design in which norms had been measured prior to measurement of the intention measure

4.10 Discussion

The findings of this study contribute to research into factors which promote the influence of norms on health behavior, specifically the influence of descriptive norms. Lapinski and Rimal (2005) have argued that behavioral privacy – the extent to which a behavior is enacted in a public or private setting, should be a likely moderator of normative influences (Bagozzi et al., 2000; Cialdini et al., 1990). They suggest that injunctive norms are less likely to influence behavior that is performed in a private setting than behavior in a public setting. However, this distinction is made with regard to different behaviors, for example college student's condom use versus their alcohol consumption. While the population is the same, the behaviors are very different. According to the reasoned action approach (Fishbein et al. 2002) behaviors are categorized according to target, action, context and time. Any change to one or more of these factors is likely to influence the underlying components (attitudes, norms, self-efficacy or other distal variables) influencing intention. This study furthers the literature by comparing the same behavior and only varying one factor – the extent to which it could be observed by another parent

The findings of this study illustrate how a (fairly subtle) manipulation of the identical behavioral scenario – the presence or absence of another parent who can observe the subjects' behavior– moderated the effects of both descriptive and injunctive norms on intention to perform sun protection behaviors. Importantly, it was also illustrated that the priming effect was specific to norms, as would be expected based on the literature reviewed here, and that observability did not prime attitudes or self-efficacy. The effect of observability on intention was influenced by the extent to which the parents' felt that close others in their social environment performed the behaviors in question (comparing parents with high or low levels of descriptive norms), or expected them to do so (comparing parents with high or low levels of injunctive norms). There were differences in behavioral intention among parents with high levels of descriptive and injunctive norms, which were in the hypothesized direction. As predicted, the mechanism of effect was typical of a priming effect. Under conditions of observability, priming increased the associations between perceived norms (descriptive and injunctive) and behavioral intention. Priming normative influence through observability increased the relative importance of perceived norms in the overall formation of behavioral intention for the two behavioral scenarios tested.

Interestingly, but consistent with what one might expect on the basis of priming theory (see Fishbein & Cappella, 2006), the effects of priming in the observable condition had differing effects depending upon the reported levels of descriptive and injunctive norms related to the behaviors examined. Parents with low levels of self-

reported injunctive and descriptive norms reported *reduced* intention when they were told that another parent was present, compared with parents with high self reported injunctive and descriptive norms who were told that they were alone with their child (in the identical scenario). For parents with low levels of norms, the presence of another parent had a dampening effect on intention. This finding is consistent with priming theory– just as the presence of another parent might increase the association between perceived normative pressure and intention among parents who reported high descriptive and injunctive norms, the same element appears to prime the perceived normative pressure *not* to perform these behaviors when observed by another parent among parents with low levels of descriptive and injunctive norms.

Taken together, these findings suggest that perceived social norms play an important role in forming intention to perform sun protection behaviors among parents of young children. The presence of another parent who can observe the behavior performed for one's child appears to prime the individual parents' perceptions of normative practice and expectations. Among parents who feel that their social environment is likely to perform these sun protection behaviors or who feel that their close friends and family expect them to do so, the presence of another parent may serve as a reinforcing agent or cue to intention.

This could have useful implications for public health practitioners who are targeting a population for which there is evidence to suggest that the prevailing social norms favor the behavior in question. For this population, a message which incorporates

a textual or visual element of observability might help increase or reinforce intention, which may then lead to an increase in the performance of the healthy behavior. However, the findings also point to a disconcerting implication with regard to populations within which the prevailing descriptive and injunctive norms are dismissive, or even discouraging, with regard to sun protection behaviors. Messages aimed at this population should avoid incorporating cues to observability by other parents in messages, as this could reduce intention or reinforce low intention among this population.

4.11 Conclusions

Future research could test the hypotheses explored herewith a different population, for example, parents of older children or populations at higher risk for skin cancer or obesity. It could also be worthwhile examine the effects of messages in other formats and with a range of manipulations of observability, both textual and/or visual, to determine whether similar interactions are observed among parents from populations which vary according to the descriptive and injunctive norms surrounding the behavior of interest.

CHAPTER 5

EXAMINING THE INTERACTION BETWEEN EXPOSURE TO NORMATIVE MESSAGES AND THE OBSERVABILITY OF BEHAVIOR ON INTENTION

5.1 Introduction

This chapter will build upon the previous chapter by examining the interaction between the observability of the behavior and message type - exposure to normative message type (vs. attitudinal message type or no message). This stage aims to determine whether a message which emphasizes the importance of social expectations has a greater influence on intention under conditions of observability.

5.2 Hypothesis

This chapter will test the hypothesis, based on research reviewed earlier (see Chapter 1), that the effect of priming observability of the behavioral setting will lead to greater intention to perform health behaviors when the message type is normative (i.e. describes normative pressure), compared with when the message type is attitudinal (i.e. describes health outcomes).

H2: Parents of young children should report greater intention to perform health behaviors with a normative context (i.e. that are observable) compared with a non-normative context (i.e. not observable) when the message type is normative compared with when the message type is attitudinal (i.e. focuses on health benefits for the child) or there is no message.

5.3 Method:

5.3.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010. Of these, 467 were retained for analysis. The unweighted demographic characteristics of the sample are presented in Table 3.1.

5.3.2 Design and procedure

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design of the studies and procedure.

5.3.3 Measures

For each of the health behaviors, the focus outcome measure was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition. The intentions measure incorporated the randomized observability manipulation – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) Message type was randomized with respondents being exposed to a message that either emphasized normative justifications or personal benefit justifications for a specific child protective behavior or they were exposed to no relevant messages on the topic. Other measures include attitudes, descriptive norms, injunctive norms, and self-efficacy relating to either sun protection or nutrition. Please refer to chapter 3 for details regarding these measures.

5.3.4 Analytical approach

Hypothesis 2 was tested among parents in the nutrition-related and the sun protection-related surveys (separately) using moderated regression analysis to test an estimating equation which includes the main effects for norms and attitudes, main effects for two of the three message conditions (norm and attitude), main effects for observability of behavior, and the interactions between the observability of the behavior

and exposure to the normative and the attitudinal message, compared with the control (no message) condition.

For hypothesis 2 to be supported, the interaction between the normative message condition and the observability of the behavioral scenario had to be positive and significantly different from the no-message group (*Normative Message*Observable)*. In addition, the interaction between the attitudinal message condition and the observable behavior scenario (*Attitudinal Message*Observable)* had to be non-significant, compared with the control group (no-message):

*Intentions= f(Injunctive norms, Attitudes, Observable vs. not, Normative Message (vs. no message), Attitudinal Message (vs. no message), Normative Message*Observable, -Attitudinal Message*Observable).*

5.4 Results

5.4.1 Manipulation check for message type

Two manipulation checks were conducted during the course of the on-line survey. The first was a manipulation check for the observability of the behavioral scenario to which subjects had been randomly assigned. Results of this manipulation check are presented in the previous chapter (see section 4.9.1).

The second manipulation check was for the type of message shown to the subjects in the message exposure conditions. Subjects in the nutrition sample were asked whether

they recalled whether the message they had seen earlier included “a statement about the importance of setting a good example for others (such as family and friends) by feeding your child healthy foods”. Similarly, subjects in the sun protection sample were asked whether they recalled whether the message they had seen earlier included “a statement about the importance of setting a good example for others (such as family and friends) by protecting your child from the sun”. Subjects’ recall of the (normative) message type was captured through a comparison of means for these two items. For both behavior types, this item was included in a list of four other items which were common to both message types (attitudinal and normative). However, given that only the normative message type included a statement concerning social expectations, participants in the normative message groups should have recalled at a significantly higher rate than those in the attitudinal message group.

Among parents in the nutrition group, a one-way comparison of means for median split item testing recall of normative component in the message showed a significant difference between the message conditions in the expected direction ($F = 6.74$, $df=164$, $p=0.01$). The mean recall among participants in the normative message (about nutrition) group was 63% (SE=0.06, CI (95%) 0.53-0.74) in comparison with the mean recall among participants in the attitudinal message group, which was 43 % (SE=0.05, CI (95%) 0.32-0.54).

Among parents in the sun protection sample, a one-way comparison of means for median split item testing recall of normative component in the message showed a

significant difference between the message conditions in the expected direction (F = 6.4, df =154, p=0.013). The mean recall that the message emphasized setting a good example among subjects in the normative message group (for sun protection) was 61% (SE=0.06, CI (95%) 0.50 - 0.72) in comparison with the mean (mistaken) recall among participants in the attitudinal message group, which was 41 % (SE=0.06, CI (95%) 0.30-0.52). Overall, across both samples, subjects assigned to a normative message recalled the normative component at a significantly higher rate than those in who received an attitudinal message. However, in both groups for both behaviors, there were a substantial number of respondents who responded incorrectly; this may suggest that the treatment distinctions, while in place, may have been blurred. This may have made it more difficult to detect effects.

5.4.2 Results of hypothesis tests

The results are organized in terms of two sections. The first section describes a test of hypothesis 2 among parents who were surveyed about nutrition behaviors for their child (n=242) and the second section describes a test of hypothesis 2 among parents who were surveyed about sun protection for their child (n=225). Each of the models presented includes the main effects for injunctive norms, main effects for attitudes, main effects for observability of behavior, main effects for message type, and the interactions between the observability of the behavior and message type (normative message and attitudinal message), compared with the no-message condition.

Table 5.1 shows the results of an OLS regression model predicting intention to serve one's child healthy foods, examining hypothesis 2 (n=242). The results show a significant positive main effect of injunctive norms (B =.41, β=.33, p< .001) and attitudes toward sun protection (B =.52, β=.34, p< .001) on intention. Observability of behavior and message type (attitudinal or normative vs. no message) did not have significant main effects on intention (p >.05). Hypothesis 2 was not supported among parents in the nutrition survey. There were no significant joint effects of the observability of behavior and exposure to a normative message type (p>.05) on intention to serve one's child healthy food. There was also no significant joint effect of the observability of behavior and exposure to an attitudinally focused message (p>.05).

Table 5.1 Results of OLS regression predicting intention to serve one's child healthy food among parents (n=242)

Variable	B	SE	β
Injunctive norms (healthy food)	.41	.07	.33***
Attitudes (healthy food)	.52	.09	.34***
Observable (Yes=1, No=0)	.22	.28	.07
Normative message (vs. no message)	.03	.28	.01
Attitudinal message (vs. no message)	-.07	.28	-.02
Observable * Normative message (vs. no message)	-.49	.39	-.13
Observable * Attitudinal message (vs. no message)	-.27	.39	-.07
R^2 (adj.) %	**30.0%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 5.2 shows the results of an OLS regression model predicting intention to practice sun protection behaviors for one's child, examining hypothesis 2 among parents in the sun protection survey (n=225). The results show a significant positive main effect of injunctive norms (B =.65, β=.46, p< .001) and attitudes toward sun protection (B =.76, β=.42, p<.001) on intention. Observability of behavior and message type (attitudinal or normative vs. no message) did not have significant main effects on intention (p >.05). Hypothesis 2 was not supported among parents in the sun protection survey. There was no significant joint effect of the observability of behavior and exposure to a normative

message type (p>.05). There was also no significant joint effect of the observability of behavior and exposure to an attitudinally focused message (p>.05).

Table 5.2 Results of OLS regression predicting intention to protect one's child from exposure to the sun among parents (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.65	.07	.46***
Attitudes (sun protection)	.76	.10	.42***
Observable (Yes=1, No=0)	.06	.29	.02
Normative message (vs. no message)	.10	.28.	.02
Attitudinal message (vs. no message)	-.24	.28	-.06
Observable * Normative message (vs. no message)	-.27	.40	-.05
Observable * Attitudinal message (vs. no message)	-.63	.40	-.13
R^2 (adj.) %	**59.8%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Figures 5.1 and 5.2 show parents' reported mean intention to perform health behaviors (nutrition and sun protection respectively) across the three message conditions and across observable and non-observable groups. We see that there are no significant differences in intention across message conditions, and (contrary to Hypothesis 2) parents in the observable condition who were exposed to a normative message did not report significantly greater intention than parents in the other message conditions.

Figure 5.1
Mean intention (observed) to serve one's child healthy food x Message type x Observability of behavior (n=242)

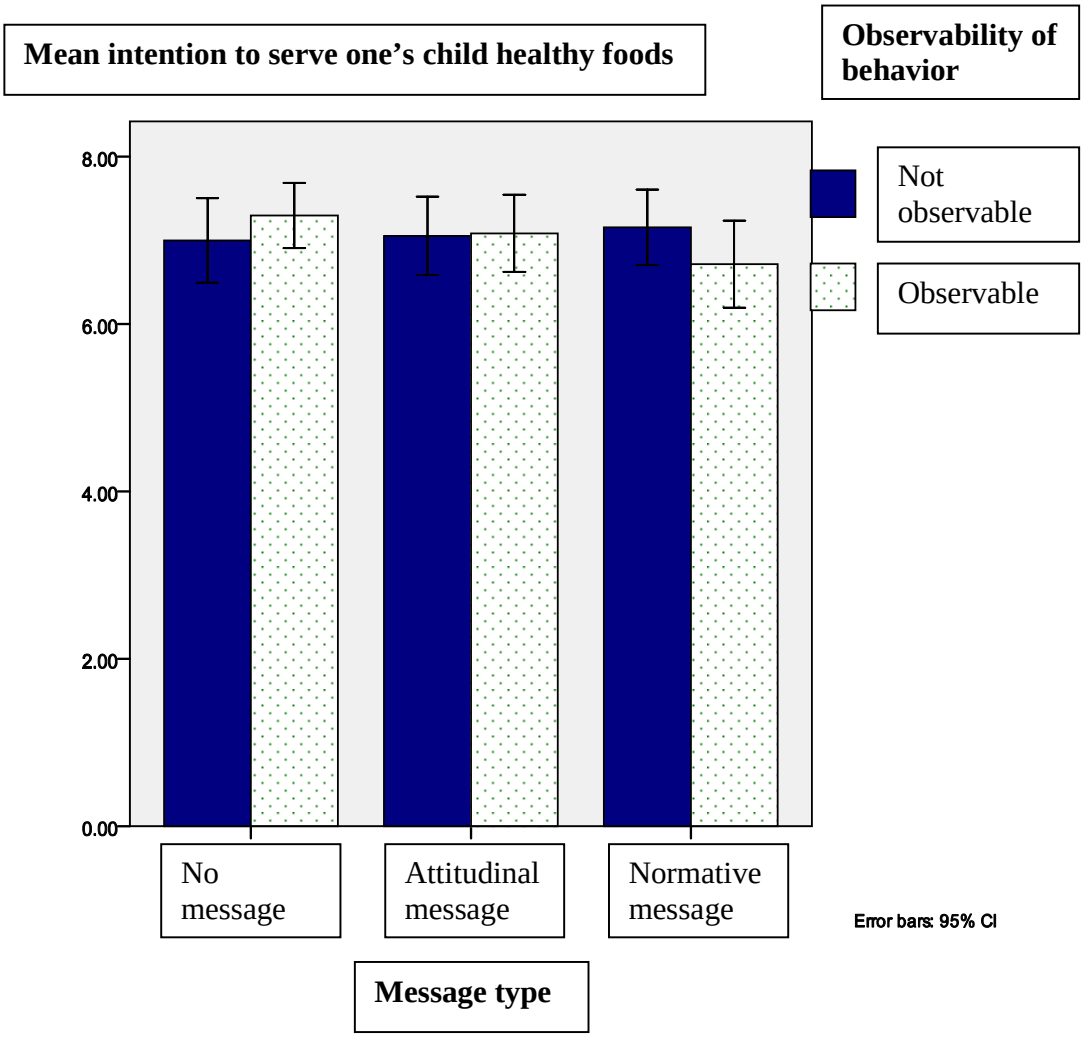
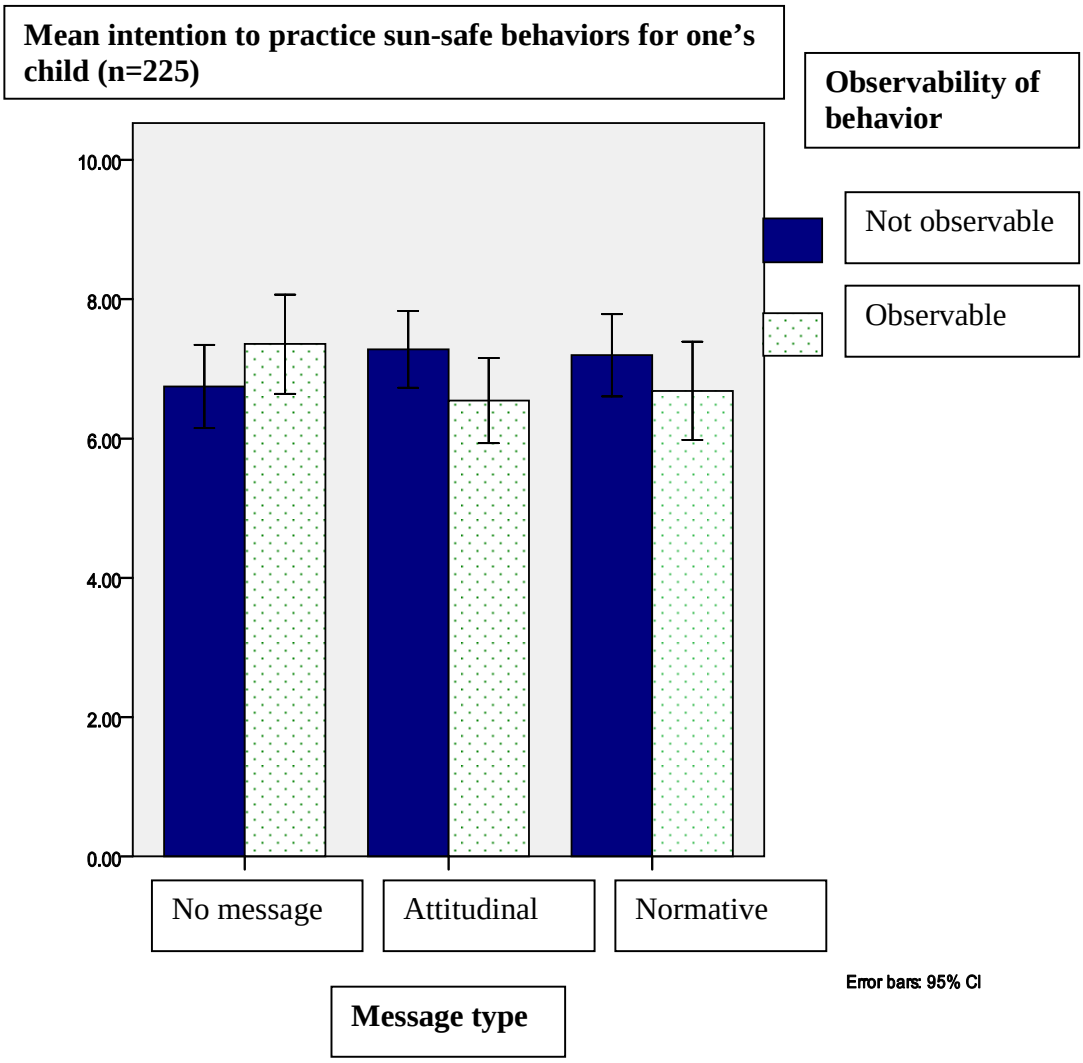


Figure 5.2
Mean intention (observed) to practice sun-safe behaviors for one's child x Message type x Observability of behavior (n=225)



5.5 Discussion

The results of this chapter show that the hypothesis about an interaction between exposure to normatively focused messages and the observability of health behaviors was

not supported. Among parents in both the nutrition and sun protection groups, there were no significant differences in responses to a normative message under conditions of observability compared with an attitudinal message or no message (see Table 5.1 and 5.2 and figures 5.1 and 5.2). These findings suggest that, contrary to expectations, the normative message did not prime normative influence through the manipulation of the context (i.e. public vs. private) of the behavior.

Parents exposed to the normative message did not respond in ways that were significantly different from responses of parents exposed to the attitudinal message. It may be that parents' paid insufficient attention to the message type manipulation, and the sections of the message which focused on social expectations of others to perform the behavior (normative) or the health benefits of doing so (attitudinal). Another explanation may be that the message type manipulation in the current study was insufficiently powerful to produce the hypothesized effects; given the lack of any main effect of the messages compared to the no message condition, this is a substantial possibility. Alternately, the results might accurately show that this hypothesis is not supported among this population and for the particular behaviors chosen for this study. If this hypothesis is to be re-examined in future research it would be advisable to incorporate a broader range of pre-tested messages in varied formats (audio-visual or interpersonal, for example), alternative behavioral outcomes, and other populations.

CHAPTER 6:

THE EFFECTS OF MESSAGE TYPE ON THE NORMATIVE AND ATTITUDINAL ROUTE TO INTENTION, AND ON PERSONALITY TRAITS

6.1 Introduction

This chapter will again focus on the effects of normative vs. attitudinal messages, compared with a no-message condition. It will describe tests of several hypotheses relating to this topic. The first of these hypotheses relate to the influence of message treatment on the normative and attitudinal route to intention.

The second part of this chapter will focus on the interactions between message type and personality traits. The first interaction to be tested will be the influence of identification with other parents (i.e. the extent to which parents report that they identify with other parents of young children) and message type. The interaction between personality traits and message type will then be tested when parents who are classified as high in other-directedness (i.e. are more attuned to others vs. self in forming intention) are expected to report greater intention when exposed to a normatively focused message. In contrast, parents classified as low in other-directedness are expected to report greater intention when exposed to an attitudinally focused message.

6.2 A comparison of mean intention for message type (main effects)

The hypotheses to be tested in this chapter (the rationale for these hypotheses is presented in Chapter 1) relate to the interactions between message treatment and other factors, rather than to the main effects of message type. However, it is still worthwhile examining the overall means for intention to practice health behaviors across the three message conditions. Below are the group means for intention for the message conditions for sun protection and for nutrition.

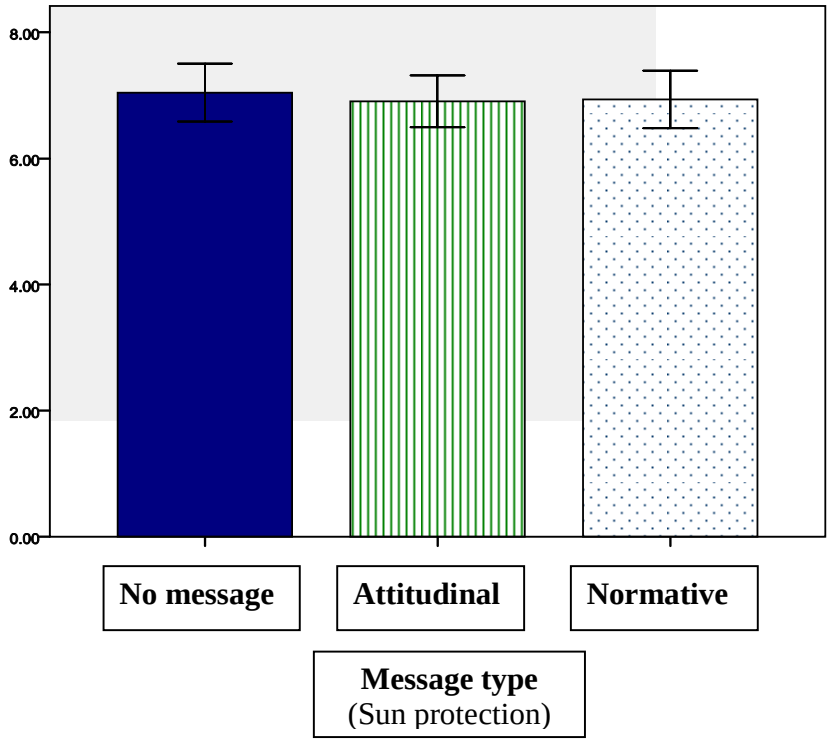
Sun protection

A Univariate ANOVA was conducting predicting differences in mean for intention to perform sun protection behaviors for one's child; a summary of results are presented below (see Table 6.1 and Figure 6.1). Levene's test for homogeneity of variance was not significant ($p > .05$). Main effects of message type revealed no significant difference in mean intention among parents who received an attitudinal message, a normative message, or no message, $F(2,222) = 0.11$, $p > .05$. Table 6.1 provides the group means for message condition, which are also shown in Figure 6.1.

Table 6.1
Group means for Message Type (Sun protection)

Message type	Mean	SD	N
No message	7.05	1.96	73
Attitudinal Message	6.91	1.81	77
Normative Message	6.93	1.97	75
Total	6.96	1.90	225

Figure 6.1
Mean (observed) intention to protect one's child from the sun among parents (n=225)



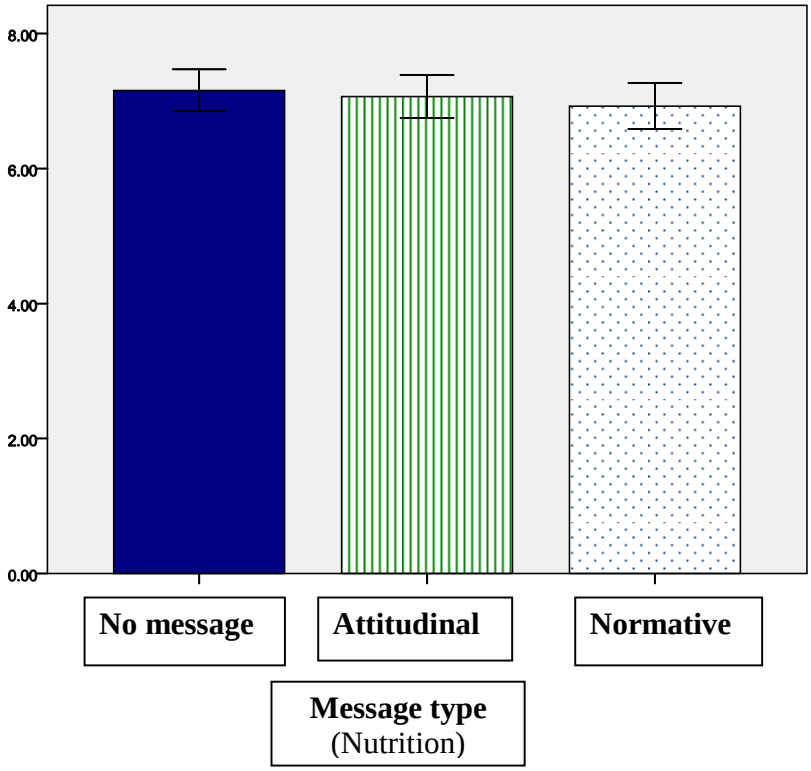
Nutrition

A Univariate ANOVA was conducting predicting differences in mean for intention to serve one's child healthy food; a summary of results are presented below (see Table 6.2 and Figure 6.2). Levene's test for homogeneity of variance was not significant ($p > .05$). Main effects of message type revealed no significant difference in mean intention among parents who received an attitudinal message, a normative message, or no message, $F(2,239) = 0.51$, $p > .05$.

Table 6.2 Group means for Message Type (Nutrition)

Message type	Mean	SD	N
No message	7.16	1.38	79
Attitudinal Message	7.07	1.44	80
Normative Message	6.93	1.57	83
Total	7.05	1.47	242

Figure 6.2
Mean (observed) intention to serve one's child healthy food among parents (n=242)



A test of the joint effects of exposure to normatively and attitudinally focused messages and injunctive norms and attitudes on intention to perform health behaviors among parents of a young child

6.3 Introduction

This section will examine the effect of messages with normative compared with attitudinal arguments on the relative weight given to attitudes and injunctive norms in forming intention to perform preventive health behaviors among parents of young children. Based on research reviewed earlier (see Chapter 1) it is hypothesized that intention to perform health behaviors will be more heavily influenced by injunctive norms among parents who are exposed to a message (relating to the need to perform preventive health behaviors for their child) that has a normative focus (i.e. stresses injunctive norms). In contrast, among parents exposed to a message that has an attitudinal focus (i.e. stresses health benefits of the behavior) there will be a stronger association between attitudes and intention to perform health behaviors than among parents exposed to a normatively focused message or no message.

6.4 Methods

6.4.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate

in an on-line survey during December of 2009 and January of 2010. Of these, 467 were retained for analysis. The unweighted demographic characteristics of the sample are presented in Table 3.1 in Chapter 3).

6.4.2 Design and procedure

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design of the studies and the procedure.

6.4.3 Measures

For each of the health behaviors, the focus outcome measure was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition. The intentions measure incorporated the randomized observability manipulation – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) Message type was randomized with respondents being exposed to a message that either emphasized normative justifications or personal benefit justifications for a specific child protective behavior or they were

exposed to no relevant messages on the topic. Other measures include attitudes, descriptive norms, injunctive norms, and self-efficacy relating to either sun protection or nutrition. Please refer to chapter 3 for details regarding these measures.

6.4.4 Analytic approach

Hypotheses 3a and 3b were tested among parents in the nutrition-related and the sun protection-related surveys (separately) using moderated regression analysis to test an estimating equation which includes the main effects for norms and attitudes, main effects for two of the three message conditions (norm and attitude), main effects for observability of behavior, and the interactions between injunctive norms and exposure to the normative and attitudinal messages (vs. no message), and the interactions between attitudes and exposure to the attitudes and exposure to the normative and attitudinal messages (vs. no message).

For hypothesis 3a to be supported, the interaction between the normative message condition and injunctive norms related to the health behavior had to be positive and significantly different from the no-message group (*Injunctive norms * Normative Message)*. In addition, the interaction between injunctive norms and the attitudinal message condition (*Injunctive norms * Attitudinal Message)* had to be non-significant, compared with the control group (no-message).

H3a: Parents exposed to a normative message (vs. attitudinal message or no message) will have a greater association between injunctive norms and intention to perform health behaviors for their child than the association between injunctive norms and intention among other parents.

For hypothesis 3b to be supported, the interaction between the attitudinal message condition and attitudes related to the health behavior had to be positive and significantly different from the no-message group (*Attitudes*Attitudinal Message)*. In addition, the interaction between attitudes and exposure to the normatively focused message (*Attitudes*Normative Message)* had to be non-significant, compared with the control group (no-message):

*Intentions= f(Injunctive norms, Attitudes, Observable vs. not, Normative Message (vs. no message), Attitudinal Message (vs. no message),[H3a: Injunctive norms*Normative Message,- Injunctive norms*Attitudinal Message] [H3b: Attitudes*Attitudinal Message, --Attitudes*Normative Message]*.

H3b: Parents exposed to an attitudinal message (vs. normative message or no message) will have a greater association between attitudes and intention to perform health behaviors for their child than the association between attitudes and intention among other parents.

6.5 Results

The results are organized in terms of two sections. The first section describes a test of H3a and H3b among parents who were surveyed about nutrition behaviors for their child (n=242) and the second section describes a test of H3a and H3b among parents who were surveyed about sun protection for their child (n=225).

Table 6.3 (below) shows the results of an OLS regression model predicting intention to serve one's child healthy foods, examining H3a and H3b (n=242). The results show a significant positive main effect of injunctive norms (B =.61, β=.40, p< .001) and attitudes toward nutrition (B =.13, β=.10, p< .001) on intention. Observability of behavior and message type (attitudinal or normative vs. no message) did not have significant main effects on intention (p >.05). There was a significant positive joint effect of injunctive norms and exposure to a normative message on intentions (B =.32, β=.16, p< .05), which is consistent with H3a. However, there was also a (stronger) positive joint effect of injunctive norms and exposure to an attitudinal message (B =.67, β=.28, p< .001), which does not support H3a. Additionally, H3b was not supported among parents in the nutrition survey. There was no positive joint effect of attitudes toward nutrition and exposure to an attitudinal message (p>.05). There was also no interaction between attitudes toward nutrition and exposure to a normative message (p>.05).

Table 6.3 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Injunctive norms (healthy food)	.13	.12	.10
Attitudes (healthy food)	.61	.14	.40***
Observable (Yes=1, No=0)	-.03	.16	-.01
Normative message (vs. no message)	-.89	.42	-.29*
Attitudinal message (vs. no message)	-.67	.43	-.22
Injunctive norms * Normative message (vs. no message)	.32	.16	.23*
Injunctive norms * Attitudinal message (vs. no message)	.67	.19	.49***
Attitudes * Normative message (vs. no message)	.05	.21	.03
Attitudes * Attitudinal message (vs. no message)	-.42	.22	-.30
R^2 (adj.) %	**33.3%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
p < .05. ** p < .01. *** p < .001.

Figures 6.3 and 6.4 (below) show parents' reported mean intention to serve their child healthy foods across the three message conditions and across groups which vary by level of injunctive norms (see Figure 6.3) and attitudes (see Figure 6.4) related to healthy nutrition. In Figure 6.3 we see a similar linear and positive effect of injunctive norms on intention across all message conditions. We do not see an interaction between exposure

to a normative message and parents' injunctive norms (H3a). That is, parents exposed to a normative message do not show a stronger effect of injunctive norms on intention than parents in the other message conditions.

Figure 6.3
Mean intention (observed) to serve one's child healthy food x Message type x Injunctive norms related to healthy food (n=242)

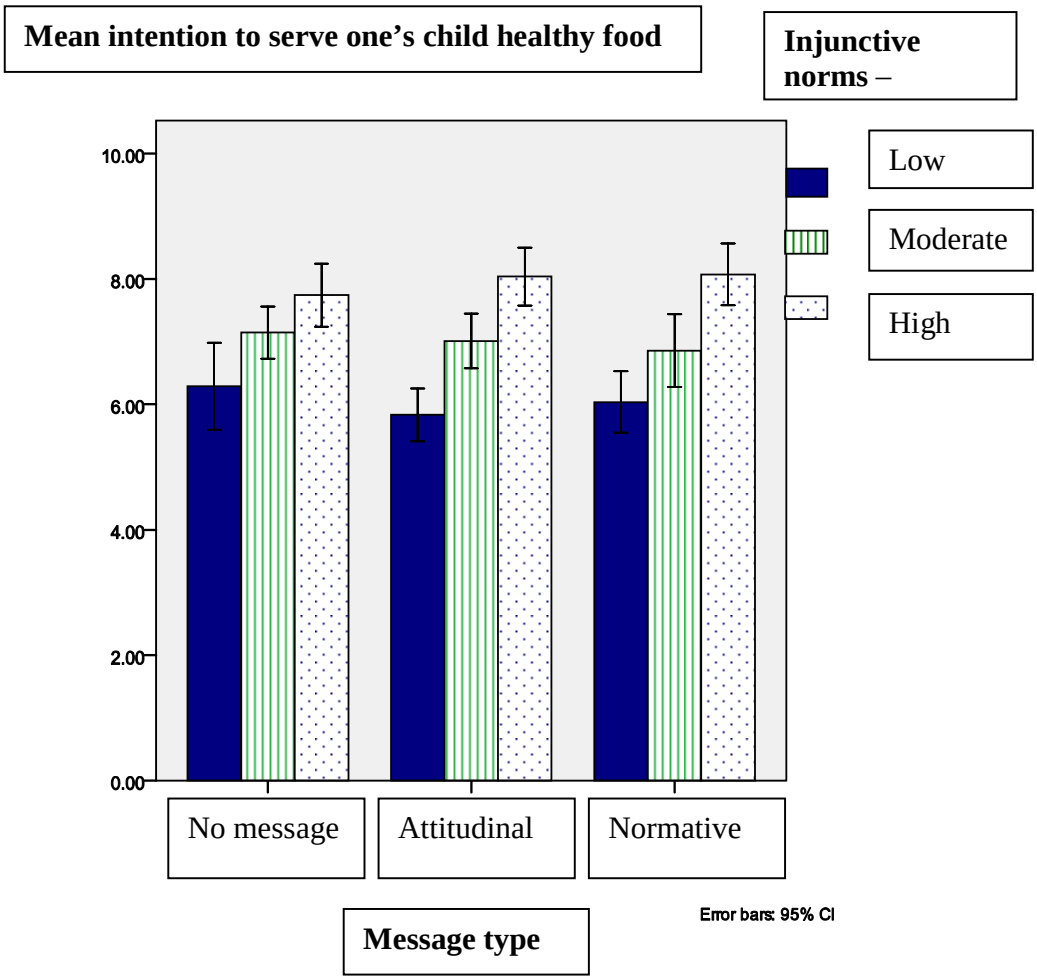


Figure 6.4 (below) shows the effects of attitudes toward nutrition on intention among parents in the nutrition survey. Parents in the normative message condition and no message condition show similar linear positive effects of attitudes on intention. (Interestingly, among parents exposed to an attitudinal message the effect of attitudes on intention appears to be non-linear. Parents with high levels of attitudes report significantly greater intention than parents with moderate or low attitudes, who have almost identical means for intention.) However, in contrast to expectations based on H3b, we do not see a stronger effect of attitudes on intention among parents exposed to an attitudinal argument.

Figure 6.4
Mean intention (observed) to serve one's child healthy food x Message type x Attitudes toward nutrition (n=242)

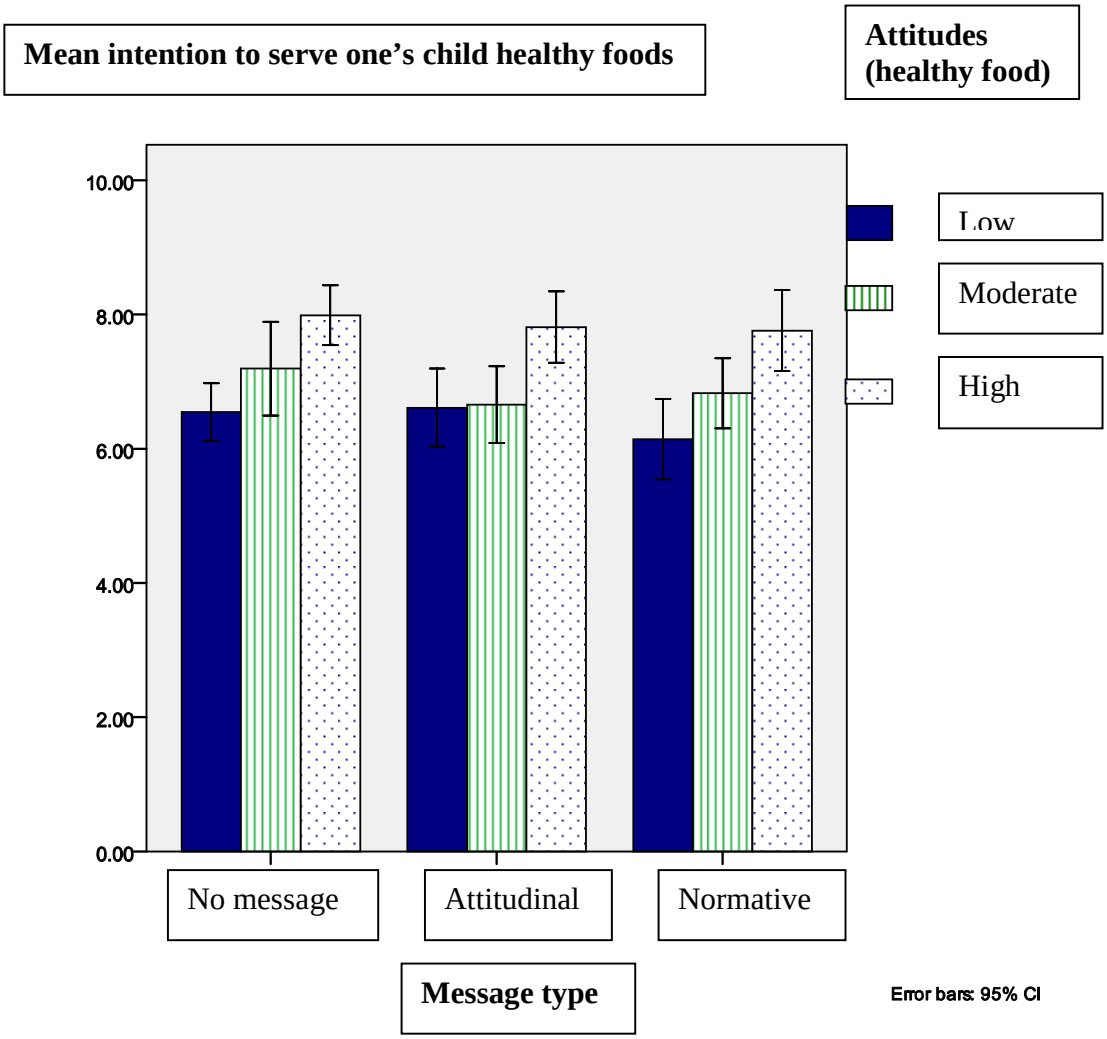


Table 6.4 (below) shows the results of an OLS regression model predicting intention to practice sun protection behaviors for one's child, examining H3a and H3b among parents in the sun protection survey (n=225). The results show a significant

positive main effect of injunctive norms (B =.96, β=.68, p< .001) and attitudes toward sun protection (B =.47, β=.26, p< .01) on intention. Observability of behavior and exposure to a normative (vs. no message) did not have significant main effects on intention (p >.05). However, there was a significant negative main effect of exposure to an attitudinal message (vs. no message) on intention to perform sun protection behaviors (B = -.52, β= -.13, p< .05). H3b was not supported among parents in the sun protection survey; there was a significant *negative* joint effect of injunctive norms and exposure to a normative message on intentions (B = -.45, β= -.20, p< .05). There was no significant joint effect of injunctive norms and exposure to an attitudinal message. Additionally, H3b was not supported among parents in this group. There was no positive joint effect of attitudes toward nutrition and exposure to an attitudinal message (p>.05). There was a significant and *positive* interaction between attitudes toward nutrition and exposure to a normative message, which was not consistent with H3b (B =.56, β=.17, p< .05).

Table 6.4 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.96	.15	.68***
Attitudes (sun protection)	.47	.18	.26**
Observable (Yes=1, No=0)	-.27	.16	-.07
Normative message (vs. no message)	-.05	.20	-.01
Attitudinal message (vs. no message)	-.52	.20	-.13*
Injunctive norms * Normative message (vs. no message)	-.45	.19	-.20*
Injunctive norms * Attitudinal message (vs. no message)	-.38	.19	-.14
Attitudes * Normative message (vs. no message)	.56	.24	.17*
Attitudes * Attitudinal message (vs. no message)	.19	.24	.06
R^2 (adj.) %	**60.5%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
p < .05. ** p < .01. *** p < .001.

Figures 6.5 and 6.6 show parents' reported mean intention to practice sun protection behaviors across the three message conditions and across groups which vary by level of injunctive norms (see Figure 6.5) and attitudes (see Figure 6.6) related to sun protection. In Figure 6.5 we see a similar linear and positive effect of injunctive norms

on intention across the attitudinal and normative message conditions. We do not see an interaction between exposure to a normative message and parents' injunctive norms (H3a). Interestingly, parents who were *not* exposed to a message show a stronger effect of injunctive norms on intention, compared with parents exposed to either an attitudinal or a normatively focused message.

Figure 6.5
Mean intention (observed) to practice sun protection behaviors x Message type x Injunctive norms related to sun protection (n=225)

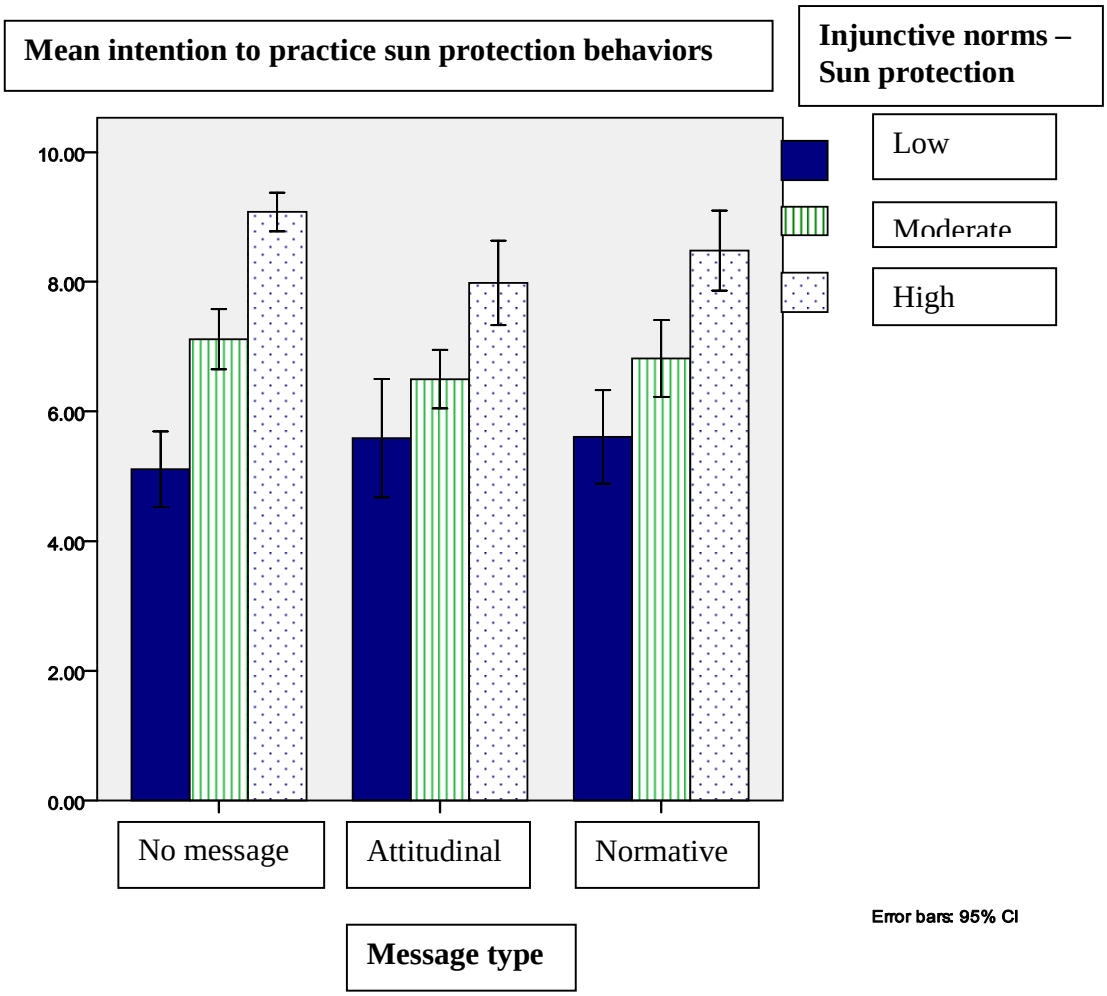
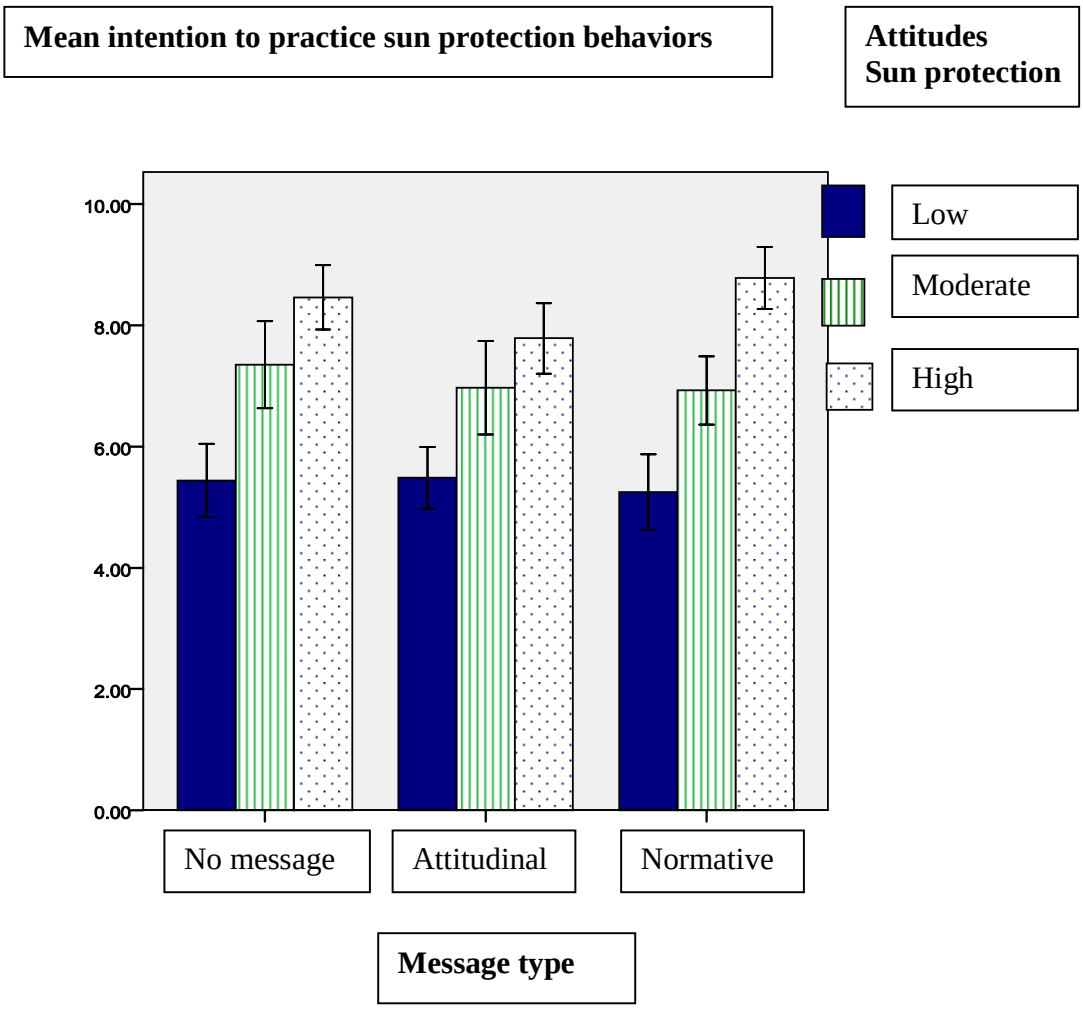


Figure 6.6 shows the effects of attitudes toward sun protection on intention among parents in the sun protection survey. Parents in all three message conditions show similar linear positive effects of attitudes on intention. We do not see an interaction between attitudes and exposure to an attitudinal message in their effects on intention. In fact, when comparing parents with high levels of attitudes toward sun protection, those who were exposed to a normatively focused message report greater intention than parents exposed to an attitudinal message.

Figure 6.6
Mean intention (observed) to practice sun protection behaviors x Message type x Attitudes toward sun protection (n=225)



6.6 Additional Analyses

One might be concerned that the analyses above, which include all main effects and a variety of interaction terms might be obscuring results because too many multi-collinear predictors are included in each equation. Additional analyses are presented here to show the main effects of the message treatments before the interactions between message treatment and norms and attitudes were included in the model. In addition, these analyses show the results for the interaction terms separately for each of the hypotheses tested.

Nutrition

Table 6.5 describes the results of a 5-step analysis predicting intention to serve one's child healthy foods (n=242), as follows:

Step1: Main effects of norms and attitudes

Step 2: Main effects of norms and attitudes and observability

Step3: Main effects of norms and attitudes, observability and message exposure

Step4: Main effects of norms and attitudes, observability and message exposure, and interaction of norms and message exposure

Step5: Main effects of norms and attitudes, observability and message exposure, and interaction of attitudes and message exposure

Please note that the full model is shown in Table 6.3.

Table 6.5 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	Step 1 β	Step 2 β	Step 3 β	Step 4 β	Step 5 β
Injunctive norms (healthy food)	.34***	.34***	.33***	.13	.33***
Attitudes (healthy food)	.34***	.34***	.35***	.33***	.33**
Observable (Yes=1, No=0)		-.01	-.01	-.01	-.01
Normative message (vs. no message)			-.07	-.26*	-.18
Attitudinal message (vs. no message)			-.07	-.36**	.00
Injunctive norms * Normative message (vs. no message)				.24*	
Injunctive norms * Attitudinal message (vs. no message)				.36**	
Attitudes * Normative message (vs. no message)					.12
Attitudes * Attitudinal message (vs. no message)					-.08
R^2 (adj.) %	30.5%	30.3%	30.2%	32.3%	30.1%

Note. B = unstandardized coefficient; β= standardized coefficient.

* p < .05. ** p<.01. *** p < .001

Sun protection

Table 6.6 describes the results of a 5-step analysis predicting intention to protect one's child from the sun (n=225), as follows:

Step1: Main effects of norms and attitudes

Step 2: Main effects of norms and attitudes and observability

Step3: Main effects of norms and attitudes, observability and message exposure

Step4: Main effects of norms and attitudes, observability and message exposure, and interaction of norms and message exposure

Step5: Main effects of norms and attitudes, observability and message exposure, and interaction of attitudes and message exposure

Please note that the full model is shown in Table 6.4.

Table 6.6 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	Step 1 β	Step 2 β	Step 3 β	Step 4 β	Step 5 β
Injunctive norms (sun protection)	46***	.46***	.47***	.57***	.46***
Attitudes (sun protection)	.40***	.41***	.42***	.40***	.40***
Observable (Yes=1, No=0)		-.06	-.06	-.07	-.06
Normative message (vs. no message)			-.01	-.01	-.01
Attitudinal message (vs. no message)			-.14**	-.13**	-.13*
Injunctive norms * Normative message (vs. no message)				-.08	
Injunctive norms * Attitudinal message (vs. no message)				-.09	
Attitudes * Normative message (vs. no message)					.06
Attitudes * Attitudinal message (vs. no message)					-.03
R^2 (adj.) %	58.0%	58.2%	59.7%	59.8%	59.7%

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p<.01. *** p < .001 .

6.7 Discussion

The results of this section show that hypotheses relating to interactions between messages focused on normative vs. attitudinal arguments and parents' self-reported

norms and attitudes and their joint effects on intention to perform health behaviors were not supported. Exposure to messages intended to prime normative beliefs or attitudes associated with intention did not prime norms or attitudes related to the behavior. There are a number of possible explanations for these findings. The first is that the subjects' exposure to the message, and the message type manipulation, was too brief to produce a priming effect on norms or attitudes. Related to this point is the possibility that, given the relatively brief exposure to the message, subjects may have paid attention to other elements in the message which were common to both message types while paying less attention to the manipulation. For example, the visual images on each of the pages of the message may have captured much of the subjects' attention, at the expense of reading the text boxes and phrases which contained the normative or attitudinal manipulation. This possibility is born out by the disconcertingly high proportion of subjects (around 40 percent) who were exposed to an attitudinally focused message but (incorrectly) recalled having seen a normative argument in the message. Thus, while the majority of subjects seem to have attended (to some degree) to the message type manipulation, a substantial proportion may not have done so, which would significantly reduce the chance of detecting priming effects in this study.

An alternative explanation for the results described in this section might be that both the attitudinal and the normative messages were perceived as not persuasive by many subjects. Evidence to suggest that this might have occurred is that neither message type had a significantly greater overall effect on behavioral intention, compared with the

no-message condition (see Table 6.1 and Table 6.2). If subjects did not respond positively when exposed to the messages, this would reduce the likelihood of detecting a priming effect such as that hypothesized in this section.

Finally, it is worth noting that the measures of intention for the two health behaviors were fairly skewed. Social desirability may have led subjects in this study to overestimate the intention to perform these health behaviors, when the true likelihood of their performing these behaviors is significantly lower. Under conditions in which outcomes are highly skewed, the likelihood of detecting interaction effects is reduced, which may have occurred in this study. Perhaps a more objective measure of behavioral intention could have produced a more realistic measure of the parents' intention to perform sun protection and nutrition behaviors.

6.8 Conclusions

Future research should re-examine the messages to ensure that the manipulation is sufficiently powerful to be correctly identified by subjects (as measured by a manipulation check such as that used in the current study) and to produce the hypothesized effects. Alternately, it may be that the messages used here and/or the population in question will not produce the hypothesized priming effects. If this hypothesis is to be re-examined in future research it would be advisable to incorporate a broader range of pre-tested messages in varied formats (audio-visual or interpersonal, for example), alternative behavioral outcomes, and other populations.

The effects of identification with other parents and message type on intention to feed one's child healthy foods and practice sun protection among parents

6.9 Introduction

On the basis of research outlined in Chapter 1, this section will test a hypothesis that parents who report high levels of identification with other parents and who are exposed to a normatively focused message will report greater intention to serve their child healthy food compared with parents who report low levels of identification with other parents who are exposed to the same normatively focused message. Among parents exposed to an attitudinally focused message or no message, it was expected that there would be no differences in intention to feed one's child healthy food for parents with different levels of identification with other parents of young children

6.10 Methods

6.10.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010. Of these, 467 were retained for analysis. The unweighted demographic characteristics of the sample are presented in Table 3.1 in Chapter 3).

6.10.2 Design and procedure

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design of the study.

6.10.3 Measures

For each of the health behaviors, the focus outcome measure was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition. The intentions measure incorporated the randomized observability manipulation – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) Message type was randomized with respondents being exposed to a message that either emphasized normative justifications or personal benefit justifications for a specific child protective behavior or they were exposed to no relevant messages on the topic. Other measures include personality traits (other-directedness and self-consciousness) attitudes, descriptive norms, injunctive norms, and self-efficacy relating to either sun protection or nutrition. Please refer to chapter 3 for details regarding these measures.

6.10.4 Analytic approach

Hypotheses 4 was tested using an estimating equation which includes the main effects for norms and attitudes, main effects for two of the three message conditions (norm and attitude), main effects for observability of behavior, parent's own nutrition/sun protection behaviors, and the interactions between identification with other parents and exposure to the normative and the attitudinal message, compared with the control (no message) condition (see below).

*Intentions= f(Injunctive norms, Attitudes, Observable vs. not, Parent's own health behaviors, Normative Message (vs. no message), Attitudinal Message (vs. no message), Identify with other parents, Normative Message*Identify, - Attitudinal Message*Identify*

For hypothesis 4 to be supported, the interaction between the normative message condition and identification with other parents had to be positive and significantly different from the no-message group (*Normative Message*Identify)*. In addition, the interaction between the attitudinal message condition and identification with other parents (*Attitudinal Message*Identify)* had to be non-significant, compared with the control group (no-message). The hypothesis was tested separately among two groups – parents who were surveyed about nutrition behaviors for their child (n=242) and parents who were surveyed about sun protection behaviors for their child (n=225).

H4: Parents of young children who identity more strongly with other parents should report higher intention to perform health behaviors when exposed to a normative message type compared with parents who identify less strongly with other parents. There should be no difference in intention for parents with high and low levels of identification with other parents who are exposed to an attitudinally focused message or no message.

6.11 Results

Table 6.7 shows the results of an OLS regression model using the sample of parents who participated in the on-line survey relating to nutrition (n=242). The model is based on the estimating equation (above) and predicts intention to serve one's child healthy foods (in the play date scenario). There were significant positive main effects of injunctive norms (B=0.34, β=0.28, p<.001) and attitudes (B=0.45, β=0.30, p<.001) on intention. There was no main effect of the observability of the behavioral scenario on intention (p> .05). Parent's own intake of healthy food was positively associated with intention (B=0.20, β=0.16, p<.01). There was no main effect of normative message type (p>.05) or attitudinal message type (p>.05) on intention, compared with the non-message exposure condition. There was also no main effect of identification with other parents on intention (p>.05). There was, however, a positive and significant association between the interaction between identification with other parents and normative message type and intention to serve one's child healthy foods (B= .08, β=0.14, p<.05). Additionally, the

interaction between identification with other parents and attitudinal message type was not a significant predictor of intention (p>.05). Thus, the results for the parents in the nutrition group support Hypothesis 4.

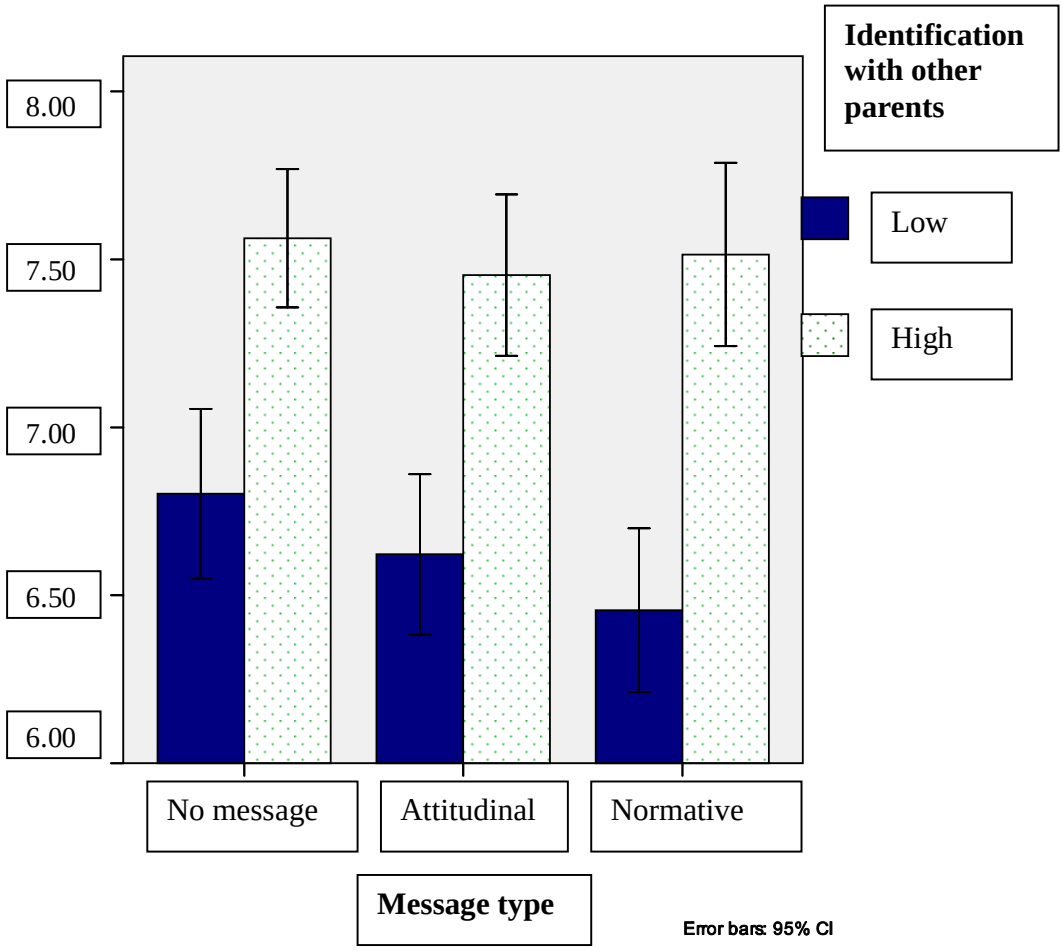
Table 6.7 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Injunctive norms (healthy food)	.34	.07	.28***
Attitudes (healthy food)	.45	.09	.30***
Observable behavioral scenario (Yes=1, No=0)	-.10	.16	-.04
Parent's intake of healthy foods	.20	.07	.16**
Normatively focused message (Yes=1, No=0)	-.25	.19	-.08
Attitudinally focused message (Yes=1, No=0)	-.20	.19	-.07
Identification with other parents	.00	.03	.00
Normative message * Identification with other parents	.08	.04	.14*
Attitudinal message * Identification with other parents	.04	.04	.06
R^2 (adj) %	**34.1%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p<.01. *** p < .001 .

The interaction between message type and identification with other parents (low vs. high) is also illustrated in Figure 6.7 (below). The figure shows that the influence of identification with other parents on intention is greatest among parents who were randomized to the normative message condition.

Figure 6.7
Mean intention (adjusted) to feed one's child healthy food x Identification with other parents x Message type (n=242)



An additional test was conducted to determine whether the observed interaction between identification with other parents and normative message type (vs. no-message) in the nutrition sample was due to exposure to the normative message type, specifically, and not simply a result of message exposure vs. not. An OLS regression model (see Table 6.8) testing the main effect of message exposure (vs. no message exposure) and the interaction between message exposure and identification with other parents showed no significant effects of the interaction between (overall) message exposure and identification (p>.05). These results suggest that the joint effects of identification and exposure to the normative message type can be attributed to the normative type of the message and not only to message exposure.

Table 6.8 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Injunctive norms (healthy food)	.35	.07	.28***
Attitudes (healthy food)	.45	.09	.30***
Observable behavioral scenario (Yes=1, No=0)	-.09	.15	-.03
Parent's intake of healthy foods	.19	.07	.16**
Message exposure (Yes=1, No=0)	.24	.16	.08
Identification with other parents	.00	.03	.00
Message exposure (vs. not) * Identification	.06	.03	.15
R^2 (adj) %	**34.4%**		

* p < .05. ** p<.01. *** p < .001.

Table 6.9 shows the results of a second OLS regression model using the sample of all parents who participated in the on-line survey relating to sun protection (n=225). The model is based on the same estimating equation (above) and predicts intention to practice a range of sun safe behaviors for one's child (in the playground / park scenario). There were significant positive main effects of injunctive norms (B=0.54, β=0.38, p<.001) and attitudes (B=0.63, β=0.35, p<.001) on intention. There was no main effect of the observability of the behavioral scenario on intention (p> .05). Parent's own sun protection behaviors were positively associated with intention (B=0.49, β=0.28, p<.001). There was an (unexpected) negative (main) effect of attitudinal message type (B= -.44, β= -.10, p<.05) compared with the group who were not exposed to a message. There was no effect of exposure to the normatively focused sun protection message (p>.05) on intention, compared with the non-message exposure condition. There was also no main effect of identification with other parents on intention (p>.05). Contrary to expectations, there is no significant effect of the interaction between identification with other parents and normative message type on intention to serve one's child healthy foods (p>.05). The interaction between identification with other parents and attitudinal message type is also not a significant predictor of intention (p>.05). Hypothesis 4 was not supported among the sample of parents in the sun protection survey.

Table 6.9 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.54	.07	.38***
Attitudes (sun protection)	.63	.09	.35***
Observable behavioral scenario (Yes=1, No=0)	-.19	.15	-.05
Parent's own sun protection	.49	.08	.28***
Normatively focused message (Yes=1, No=0)	-.02	.19	-.01
Attitudinally focused message (Yes=1, No=0)	-.44	.19	-.10*
Identification with other parents	.03	.03	.06
Normative message * Identification with other parents	-.01	.04	-.02
Attitudinal message * Identification with other parents	-.04	.04	-.05
R^2 (adj.) %	**65.8%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p<.01. *** p < .001.

6.12 Discussion

The results of this hypothesis test contribute to research into factors which moderate the effects of exposure to normatively focused messages on intention to perform healthy behaviors. Among parents of a child aged five through nine who were exposed to a message which emphasized injunctive norms related to nutrition for their child, intentions to serve their child healthy foods were influenced by reference group

norms, but only for those parents for whom the group membership was a salient basis for self-definition.

These findings are consistent with research into social identity and self-categorization theories described in Chapter 1 (Doosje & Ellemers, 1997; Terry, Hogg, & Duck, 1999; Terry & Hogg, 1996). Among parents for whom group membership with other parents was salient, in accordance with predictions based on social categorization theory (Turner & Onorato, 1999), the normative message was more likely to lead to conformity to the expectations of the positive reference group – other parents, in the form of increased intention to perform the recommended behavior. Among parents who did not identify with other parents as a positive reference group, exposure to the normative message did not influence intention. It should be noted, however, that the hypothesis was supported among parents in the groups surveyed about nutrition but not among parents in groups who were asked about sun protection behaviors. The observed association between identification with other parents and exposure to a normatively focused message should therefore not be generalized to other types of health behaviors without further testing.

It should also be noted that, among parents in the sun protection group, there was a significant negative main effect of exposure to an attitudinal message type on intention to perform sun protection behaviors for one's child. This unexpected boomerang effect of exposure to the attitudinal message on intention warrants further examination. In light

of this result, it is advisable to revise and re-test the attitudinal message among additional groups of parents of young children, prior to using the message in subsequent studies.

The findings described here contribute to research into factors which may interact with the effects of messages among particular sub-groups in the population, who are, according to a theoretical or empirical rationale, thought to be more susceptible to effects than other groups. In this case the message factor being tested was emphasis on normative versus attitudinal motivations to perform a healthy behavior for one's child, in comparison with a control group which was not exposed to any message. The individual-level characteristic that was found to interact with message type was the extent to which a parent reported that they identified with other parents of young children, a measure that was shown to moderate parent's responses to a normatively focused message about nutrition.

The implications of these findings for public health practitioners are that in designing a persuasive message aimed at parents of young children, it is important to match the message type to the audience characteristics, in order to maximize its persuasive effect. A normatively focused message may be perceived as unpersuasive if a large proportion of its audience do not identify with the referent group (i.e. other parents). For example, in individualistic and highly urban populations in which most individuals tend to have weak social ties with other individuals, levels of identification with other parents might be weaker. In contrast, in a collectivistic society in which social ties between parents (and other groups) tend to be stronger, parents might be more susceptible

to persuasive messages about nutrition if exposed to a normatively focused message rather than an attitudinally focused message.

Consequently, in order to increase the likelihood that a message will influence behavioral intention among a target audience, message design should account for variance in audience susceptibility to message type, in this case, to a normatively focused message compared with no message. If preliminary research suggests that a high proportion of parents in a particular target population report low levels of identification with other parents, a normative message promoting healthy nutrition behaviors for children may not be a good fit to that population. In fact, among this kind of population, exposure to a normative message such as the message tested in the current study might be more detrimental in terms of its effects on intention to perform healthy nutrition behaviors for one's child among parents than no message exposure at all. An alternative approach, such as using a message which emphasizes the health benefits of the recommended behavior, might work better. However, if research suggests that many parents in the population *do* identify with other parents, a normatively focused message would be a good choice. Fitting the message type to the population at hand could be a more time-consuming approach than a one-message-fits-all model of health communication; however, it might also lead to improved outcomes of exposure to the message in terms of intention, and eventually behavior change.

CHAPTER 7: THE EFFECTS OF MESSAGE TYPE AND OTHER-DIRECTEDNESS ON INTENTION

7.1 Introduction

The central objective of this chapter is to test the hypothesis that particular personality traits will interact with injunctive norms and attitudes in their effects on intention to practice healthy behaviors. Specifically, the construct of interest is the tendency to be influenced by others versus self – when individuals who have a greater tendency to be influenced by others are differentiated from those who are more influenced by their own beliefs when forming intention. Based on the research reviewed earlier (see Chapter 1) it is hypothesized that certain personality traits will interact with norms and attitudes in their effects on intention. Specifically, it is proposed that normative (vs. attitudinal) messages will interact with other directed (versus inner-directed) personality (defined by high other directed or low private self-consciousness versus others) in their effect on behavioral intentions.

7.2 Methods

7.2.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010. Of these, 467 were

retained for analysis. The unweighted demographic characteristics of the sample are presented in Table 3.1 in Chapter 3).

7.2.2 Design and procedures

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design of the studies and the measures.

7.2.3 Measures

For each of the health behaviors, the focus outcome measure was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition. The intentions measure incorporated the randomized observability manipulation – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) Message type was randomized with respondents being exposed to a message that either emphasized normative justifications or personal benefit justifications for a specific child protective behavior or they were exposed to no relevant messages on the topic. Other measures include personality traits

(other-directedness and self-consciousness), attitudes, descriptive norms, injunctive norms, and self-efficacy relating to either sun protection or nutrition. Please refer to chapter 3 for details regarding these measures.

7.2.4 Analytic approach

Hypotheses 5a and 5b were tested among parents in the nutrition-related and the sun protection-related surveys (separately) using moderated regression analysis to test an estimating equation which includes the main effects for norms and attitudes, main effects for two of the three message conditions (norm and attitude), main effects for observability of behavior, and the interactions between the personality traits of other-directedness and self-consciousness and exposure to the normative and the attitudinal message, compared with the control (no message) condition (see below). The other-directedness and self-consciousness scales were treated as continuous variables. In addition, analyses account for the effects of parent's race on intention (White vs. Other[12]), and the number of children (aged up to eighteen years old) living at home.

[12] These demographic characteristics were significantly associated with the outcome variable, unlike other demographic characteristics such as married/not, employed/not, education levels and parents' or child's gender. As the other characteristics were not associated with intention in all analyses they were not included in the final models.

*Intentions= f(Injunctive norms, Attitudes, Observable vs. not, Parent's race (White vs. Other), Number of children living at home,, Normative Message (vs. no message), Attitudinal Message (vs. no message), Identify with other parents, [**H5A**: Normative Message*Other-directed, -Attitudinal Message*Other-directed],[**H5B**:, Attitudinal Message*Self-Conscious, - Normative Message*Self-conscious]* .

For hypothesis 5a to be supported, the interaction between the other-directedness and the normative message condition had to be positive and significantly different from the no-message group (*Normative Message*Other-directed).* In addition, the interaction between other-directedness and the attitudinal message group (*Attitudinal Message*Other-directed)* had to be non-significant, compared with the control group (no-message).

H5a: Parents of young children who are high in other-directedness should report higher intention to perform health behaviors when exposed to a normative message type compared with parents who are low in other-directedness. There should be no difference in intention for parents with high and low levels of other-directedness who are exposed to an attitudinally focused message or no message.

For hypothesis 5b to be supported, the interaction between self-consciousness and the attitudinal message condition had to be positive and significantly different from the no-message group (*Attitudinal Message* Self-conscious).* In addition, the interaction between self-consciousness and the normative message condition (*Normative Message*Self-conscious)* had to be non-significant, compared with the control group (no-message).

H5b: Parents of young children who are high in self-consciousness should report higher intention to perform health behaviors when exposed to an attitudinal message type compared with parents who are low in self-consciousness. There should be no difference in intention for parents with high and low levels of self-consciousness who are exposed to a normatively focused message or no message.

7.3 Results

Hypotheses 5a and 5b were tested separately among the two groups – parents who were surveyed about nutrition behaviors for their child (n=242) and parents who were surveyed about sun protection behaviors for their child (n=225). Table 7.1 shows the results of an OLS regression model using the sample of parents who participated in the on-line survey relating to nutrition. The model is based on the estimating equation (above) and predicts intention to predicting intention to serve one's child healthy foods

(in the play date scenario). There were significant positive main effects of injunctive norms (β=0.28, p<.001) and attitudes (β=0.31, p<.001) on intention. There was a significant negative main effect of parents' race (White vs. other race) on intention (β= -0.11, p<.001). There was no main effect of the observability of the behavioral scenario on intention (p>.05). There was also no main effect of normative message type (p>.05) or attitudinal message type (p>.05) on intention, compared with the no message condition. There was also no main effect of other-directedness (p>.05) or self-consciousness (p>.05) on intention. Results did not support predictions for H5a: there were no significant effects of the interactions between other-directedness and exposure to the normative message (vs. the control) (p>.05). There was also no significant joint effect of other-directedness and exposure to the attitudinal message (p>.05). Results did support H5b among parents in the nutrition-related sample. As predicted, there was a positive and significant joint effect of self-consciousness and exposure to the attitudinally focused message (vs. no message) (β=0.15, p<.05). Additionally, as predicted, the interaction between self-consciousness and normative message type on intention was not significant (p>.05).

Table 7.1 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Injunctive norms (healthy food)	.34	.07	.28***
Attitudes (healthy food)	.48	.09	.31***
White (Yes=1, No=0)	-.45	.22	-.11*
Number of children at home	.21	.09	.11*
Other directed	-.04	.02	-.17
Self-conscious	.03	.03	-.11
Observable behavioral scenario (Yes=1, No=0)	-.03	.16	-.01
Normatively focused message (Yes=1, No=0)	-.23	.19	-.08
Attitudinally focused message (Yes=1, No=0)	-.13	.19	-.04
Normative message * Other directed	.02	.03	.04
Attitudinal message * Other directed	.00	.03	.00
Normative message * Self-conscious	.00	.04	.00
Attitudinal message * Self-conscious	.08	.04	.15*
R^2 (adj) %	**35%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* $p < .05$. ** $p < .01$. *** $p < .001$

The interaction between message type and self-consciousness is also illustrated in Figure 7.1 (below). Participants are divided into groups based on those who had scores for self-consciousness which fell more than one standard deviation from the scale mean, those whose scores were greater than one standard deviation from the scale mean but less than one standard deviation above the mean, and those whose scores were greater than one standard deviation above the mean. The figure shows that parents with lower levels of self-consciousness showed significantly decreased intention in response to the attitudinal message compared with the no-message condition

Figure 7.1
Mean intention (adjusted) to feed one's child healthy food x self-consciousness x Message type (n=242)

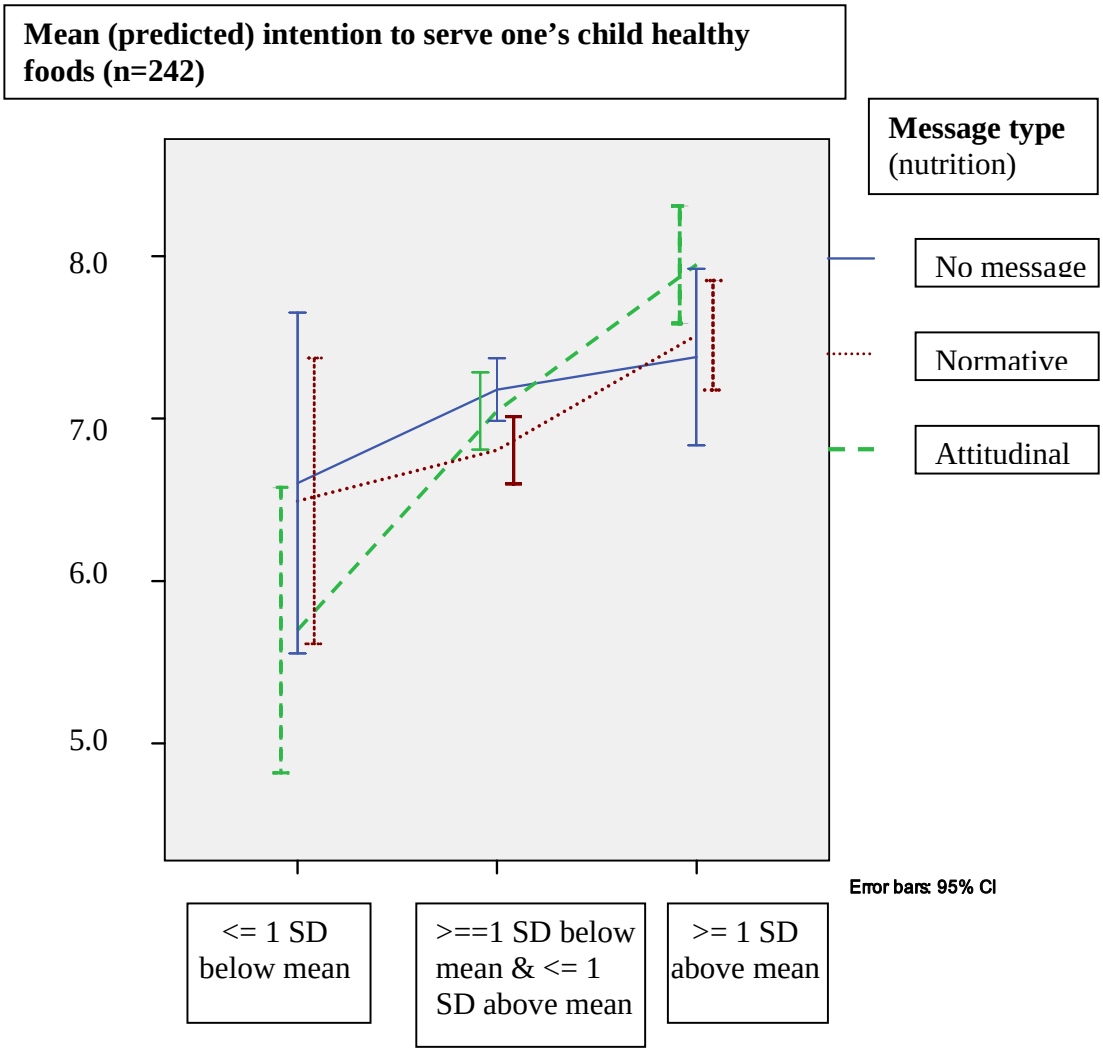


Table 7.2 shows the results of an OLS regression model using the same sample of parents who participated in the on-line survey relating to nutrition but testing hypotheses 5a and 5b separately. As other-directedness and self-consciousness are meant to be alternative ways of capturing the same underlying construct (or very closely related concepts) then putting them both in the same equation may undermines the likelihood of both showing a significant effect. Therefore, it is worthwhile examining the effects of each trait and their interactions with message type separately. The column showing results for H5a includes the main effects of other-directedness and the interaction between other-directedness and message type. The column showing results for H5b includes the main effects of self-consciousness and the interaction between self-consciousness and message type. The results of the separate hypotheses tests are parallel to those shown in the combined model.

Table 7.2 Results of OLS regression (testing H5a and H5b separately) predicting intention to serve one's child healthy foods among parents (n=242)

Variable	H5a	H5b
	β	β
Injunctive norms (healthy food)	.34***	.27***
Attitudes (healthy food)	.32***	.35***
White (Yes=1, No=0)	-.10	-.11*
Number of children living at home	.08	.11*
Other directed	-.14	-
Self-conscious	-	.08
Observable behavioral scenario (Yes=1, No=0)	-.01	-.01
Normatively focused message (Yes=1, No=0)	-.06	-.08
Attitudinally focused message (Yes=1, No=0)	-.05	-.06
Normative message * Other directed	.05	-
Attitudinal message * Other directed	.06	-
Normative message * Self-conscious	-	-.00
Attitudinal message * Self-conscious	-	.14 (p=0.05)
R^2 (adj) %	31.4%	33.9%

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p< .01. *** p < .001

Table 7.3 shows the results of a second OLS regression model using the sample of all parents who participated in the on-line survey relating to sun protection (n=225). The

model is based on the same estimating equation (above) and predicts intention to practice a range of sun safe behaviors for one's child (in the playground / park scenario). There were significant positive main effects of injunctive norms (β=0.43, p<.001) and attitudes (β=0.47, p<.001) on intention. There was no main effect of the observability of the behavioral scenario (p> .05) or of parent's race (p>.05) on intention. There was no main effect of normative message type (p>.05). There was a negative main effect of attitudinal message type (β= -.14, p>.01) on intention, compared with the non-message exposure condition. There was no main effect of other-directedness (p>.05) or self-consciousness (p>.05) on intention. Results summarized in Table 7.3 did not support predictions for H5a or H5b among parents in the sun-protection related group. There were no significant effects of the interactions between other-directedness and normative message type on intention (p>.05) or of other-directedness and attitudinal message type on intention (p>.05). There were also no significant effects of the interactions between self-consciousness and attitudinal message type on intention (p>.05) or self-consciousness and normative message type on intention (p>.05).

Table 7.3 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Injunctive norms (sun protection)	.63	.08	.43***
Attitudes (sun protection)	.84	.09	.47***
White (Yes=1, No=0)	.21	.22	.04
Number of children living at home	.15	.12	.06
Other directed	.01	.03	.03
Self-conscious	-.01	.03	-.03
Observable behavioral scenario (Yes=1, No=0)	-.30	.17	-.08
Normatively focused message (Yes=1, No=0)	-.08	.20	-.02
Attitudinally focused message (Yes=1, No=0)	-.60	.20	-.14**
Normative message * Other directed	-.03	.03	-.05
Attitudinal message * Other directed	.00	.03	.00
Normative message * Self-conscious	.06	.04	.10
Attitudinal message * Self-conscious	.05	.04	.07
R^2 (adj) %	**63%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p< .01. *** p < .001

Table 7.4 shows the results of an OLS regression model using the same sample of parents who participated in the on-line survey relating to nutrition but testing hypotheses 5a and 5b separately. The rationale for this step has been outlined above. The column showing results for H5a includes the main effects of other-directedness and the

interaction between other-directedness and message type. The column showing results for H5b includes the main effects of self-consciousness and the interaction between self-consciousness and message type. The results of the separate hypotheses tests are parallel to those shown in the combined model.

Table 7.4 Results of OLS regression (testing H5a and H5b separately) predicting intention to protect one's child from exposure to the sun (n=225)

Variable	**H5a**	**H5b**
	β	**β**
Injunctive norms (sun protection)	.48***	.46***
Attitudes (sun protection)	.41***	.41***
White (Yes=1, No=0)	.03	.05
Number of children living at home	.05	.06
Other directed	.02	-
Self-conscious	-	-.03
Observable behavioral scenario (Yes=1, No=0)	-.07	-.06
Normatively focused message (Yes=1, No=0)	-.00	-.01
Attitudinally focused message (Yes=1, No=0)	-.14**	-.14**
Normative message * Other directed	-.02	-
Attitudinal message * Other directed	.03	-
Normative message * Self-conscious	-	.10
Attitudinal message * Self-conscious	-	.08
R^2 (adj) %	**59.3%**	**60.2%**

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p< .01. *** p < .001

7.4 Discussion

The results of this study show a positive effect of an attitudinal message (vs. no message) among higher self-conscious people compared to the effects of an attitude message (vs. no message) among less self-conscious people. Parents who were categorized as having low levels of private self-consciousness reported significantly lower intention to serve their child healthy foods than parents with higher levels of this trait, following exposure to an attitudinally focused message, compared with no message.

The (revised) private self-consciousness scale (Scheier & Carver, 1985) measures the extent to which individuals are attuned to their personal and privately held beliefs, values and feelings when forming intention, in contrast to individuals who are more concerned with how their overt behavior might appear to others. In contrast, parents who are low in this trait may be less likely to attend to, and consequently less likely to be influenced by, a message which describes the benefits of a particular behavior, compared with other message types. While this result was of interest and consistent with the hypothesized direction, it was one significant result among four that tested proposed hypotheses in this section. The possibility that this is merely a chance result cannot be discounted.

The results of this study did not support the hypothesis that other directedness would interact with exposure to a normative message in their joint effects on intention, for either nutrition or sun protection messages. This might suggest that the responses of the sample used in this study to this measure were not consistent with responses of other

samples in prior research. One indication that this might be the case is that the two measures of other directedness and self-consciousness were *positively* correlated (R=0.31, p<.001), rather than negatively correlated, as one might expect[13]. Perhaps an alternative measure of normative susceptibility might have shown results which were more consistent with hypotheses proposed here.

The next section of this chapter will test the validity of the personality trait measures used here by looking for evidence that parents who were higher in other directedness were also more responsive to subjective norms in developing intentions (i.e. under conditions of observability), than those with lower other directedness. It will also seek to validate the self-consciousness measure by seeking evidence that parents who are high in this trait will be <u>less</u> responsive to subjective norms in developing intentions (i.e. under conditions of observability), than those with lower self-consciousness.

Another limitation of the findings described here is that the observed effects of private self-consciousness and exposure to an attitudinally focused message were seen only among parents in the sample surveyed about nutrition-related behavior. The same effect was not seen among the sample of parents in the sun protection group. This would suggest that the joint effects of private self-consciousness and message type should not be generalized to other behavioral domains without further testing. Finally, the major dissertation study relied on self-report of intention to perform healthy behaviors for one's child. Intention and actual behavior may differ.

[13] Interestingly, for the pilot study (July 2009), the two scales were not correlated with each other (R=0.06, p>.05), which is more consistent with expectations.

7.5 Conclusions

The analyses presented here represent a first attempt to explore the joint effects of private self-consciousness and other-directedness and exposure to messages about healthy behaviors among parents of young children. Future research should re-examine this hypothesis among a wider sample of behaviors and messages. These findings contribute to the literature as it applies an experimental design to the examination of the joint effects of two personality traits and exposure to messages. Previous studies have explored the intersection between attitudes and norms and these traits through observational studies, and have not tested the effects of messages aimed at priming these pathways to intention. Future research should investigate whether alternative traits might more sensitively measure the concept of normative and attitudinal susceptibility to persuasion through exposure to normatively focused and attitudinally focused messages.

A TEST OF THE JOINT EFFECTS OF PERSONALITY TRAITS AND THE OBSERVABILITY OF HEALTH BEHAVIORS ON INTENTION TO PERFORM HEALTH BEHAVIORS AMONG PARENTS

7.6 Introduction

This section describes the results of OLS regression models which examine the interactions between personality traits and the observability of sun protection and nutrition behaviors among parents of young children. These are hypotheses from the field of social psychology (rather than communication-focused hypotheses) which are directly implied by the theoretical review outlined earlier. Although these are not primary communication theoretic hypotheses, they are of substantial psychological interest.

7.7 Hypotheses

Based on the research reviewed in Chapter 1 relating to the dispositional traits are self-monitoring (Snyder, 1974) and private self-consciousness (Fenigstein, Scheier, & Buss, 1975), it is proposed that parents who are more attuned to the opinions of others can be categorized as other-directed, and are expected to be more responsive to observability cues in a scenario describing a health behavior, compared with other parents. In addition, the hypotheses in this section can be used as a means of validating

the personality trait measures used in the previous section of this chapter in the context of the current study.

Among this group of parents the presence of a referent other who can observe their behavior is expected to lead to higher behavioral intention In contrast, parents who are higher in private self-consciousness and more aware of their own attitudes and beliefs are expected to be less responsive to observability cues than parents who are low in this trait. The (positive) effects of observability of behavior on intention to perform sun protection and nutrition behaviors for one's child should be greater among parents who are less focused on their own attitudes, and thus, arguably, less attuned to other factors, such as the presence of another parent.

7.8 Methods

7.8.1 Sample

Four hundred and ninety-eight parents of at least one child who was between the ages of five through nine were recruited by Survey Sampling International to participate in an on-line survey during December of 2009 and January of 2010. Of these, 467 were retained for analysis. The unweighted demographic characteristics of the sample are presented in Table 3.1 in Chapter 3).

7.8.2 Design and procedures

Nutrition and sun protection studies are presented and analyzed as separate studies, although they were undertaken at the same time, and respondents were randomly assigned to one or the other study. Please refer to chapter 3 for details regarding the design of the studies and the procedures.

7.8.3 Measures

For each of the health behaviors, the focus outcome measure was intention to feed one's child healthy foods in the behavioral scenario depicted (i.e. playdate at the parent's house) and intention to protect one's child from (the effects of excessive) exposure to the sun in the sun protection condition. The intentions measure incorporated the randomized observability manipulation – with respondents being asked whether or not they would engage in the target behavior either when they were observed by other parents or when they were not told they were being observed (in the case of sun protection) or when being observed was not mentioned (in the case of obesity.) Message type was randomized with respondents being exposed to a message that either emphasized normative justifications or personal benefit justifications for a specific child protective behavior or they were exposed to no relevant messages on the topic. Message type is not included in the analyses which follow, however. Other measures include personality traits (other-directedness and self-consciousness), attitudes, descriptive norms, injunctive norms, and

self-efficacy relating to either sun protection or nutrition. Please refer to chapter 3 for details regarding these measures.

7.8.4 Analytic approach

Hypotheses 6 and 7 were tested among parents in the nutrition-related and the sun protection-related surveys (separately) using moderated regression analysis to test an estimating equation which includes the main effects for norms and attitudes, main effects for observability of behavior, main effects for observability (H7), main effects for self-consciousness (H8) and the interactions between the personality traits of other-directedness and the observability of behavior. The observability of behavior was manipulated. The other-directedness and self-consciousness scales were treated as continuous variables.

H6: That intention will vary as a function of observability and other-directedness. Parents high in other-directedness should be more affected by being observed than parents who are low in other-directedness.

*H6: Intentions= f(Injunctive norms, Attitudes, Other-Directed, Observable vs. not, Other-Directed*Observable*

For hypothesis 6 to be supported, the interaction between other-directedness and the observability of behavior (*Other-Directed*Observable*) had to be positive and significant.

H7: That intention will vary as a function of observability and private self-consciousness. Parents high in private self-consciousness should be less affected by being observed than parents who are low in private self-consciousness.

*H7: Intentions= f(Injunctive norms, Attitudes, Self-conscious, Observable vs. not, , Self-conscious *Observable)*

For hypothesis 6 to be supported, the interaction between self-consciousness and the observability of behavior (*Other-Directed*Observable*) had to be negative and significant.

7.9 Results

The results are organized in terms of two sections. The first section describes tests of hypotheses 6 and 7 among parents who were surveyed about nutrition behaviors for their child (n=242) and the second section describes tests of hypotheses 6 and 7 among parents who were surveyed about sun protection for their child (n=225).

Table 7.5 shows the results of an OLS regression model predicting intention to serve one's child healthy foods, examining hypothesis 7 (n=242). The results show a significant positive main effect of attitudes (B =.47, β=.31, p< .001) and injunctive norms toward sun protection (B =.44, β=.36, p< .001) on intention. There was a significant negative effect of other-directedness on intention (B = -.04, β=.20, p< .05). Observability of behavior did not have a significant main effect on intention (p >.05). Consistent with hypothesis 7, there was a significant positive joint effect of observability and other-directedness on intention to serve one's child healthy food among parents of young children (B =.05, β=.15, p< .05).

Table 7.5 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	**B**	**SE**	**β**
Attitudes (healthy food)	.47	.09	.31***
Injunctive norms (healthy food)	.44	.07	.36***
Other-directed	-.04	.02	-.20*
Observable (Yes=1, No=0)	-.02	.16	-.01
Observable * Other Directed	.05	.02	.15*
R^2 (adj.) %	**31.6%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

The interaction between observability of behavior and other-directedness is illustrated in Figure 7.2. The figure shows that parents who are high in other directedness report greater intention in the observable scenario than in the non-observable scenario. This pattern is reversed among parents who are low in other directedness. Overall, there is a negative effect of other-directedness on intention, but this effect is mitigated somewhat among parents in the nutrition-related survey who are in the observable condition, which is consistent with hypothesis 6.

Figure 7.2
Mean intention (observed) to serve one's child healthy food x Other-directedness x Observability of behavior (n=242)

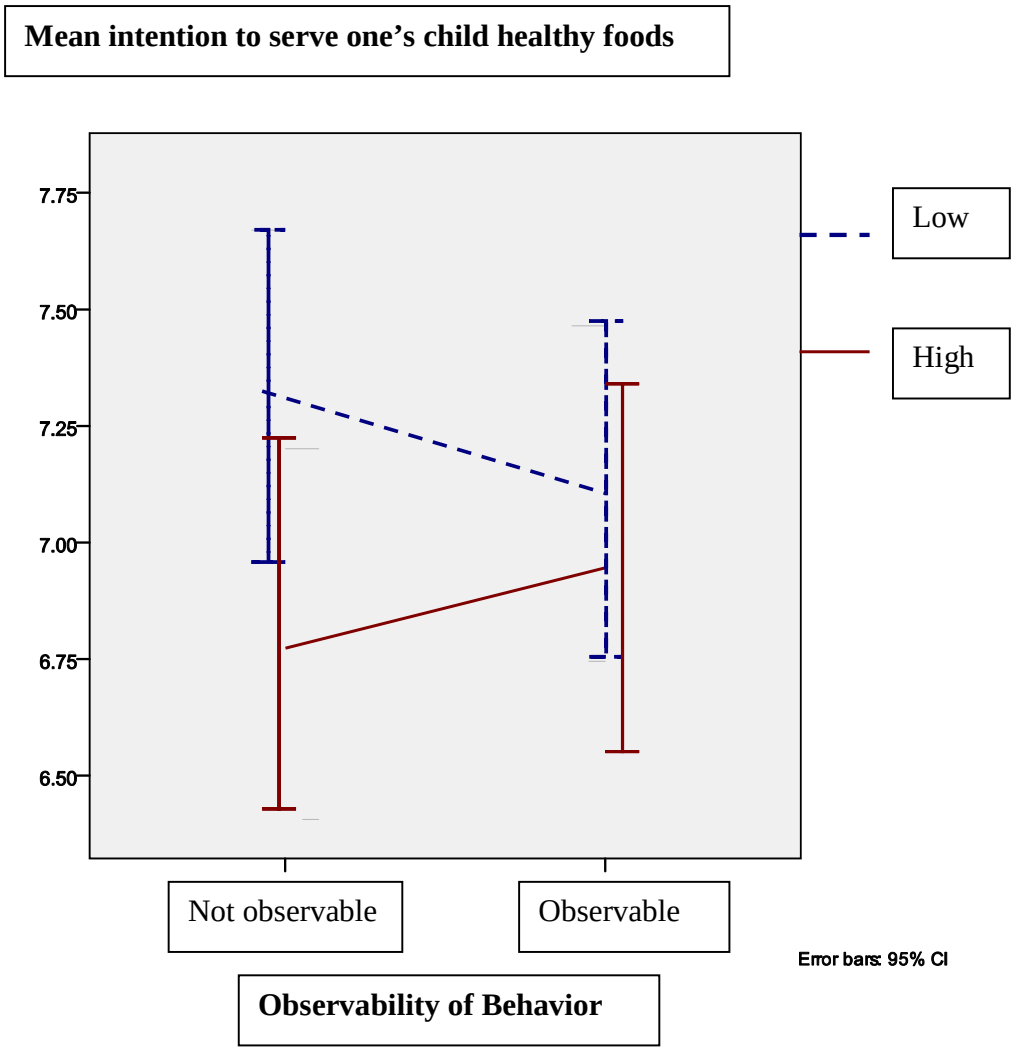


Table 7.6 shows the results of an OLS regression model predicting intention to serve one's child healthy foods, examining hypothesis 7 (n=242). The results show a

significant positive main effect of attitudes (B =.52, β=.34, p< .001) and injunctive norms (B =.37, β=.30, p< .001) on intention. There was no main effect of private self-consciousness on intention (p > 0.05). Observability of behavior did not have a significant main effect on intention (p >.05). The results for parents in the nutrition-related sample did not support hypothesis 7. There was no significant joint effect of observability and private self-consciousness on intention to serve one's child healthy food among parents of young children (p > .05).

Table 7.6 Results of OLS regression predicting intention to serve one's child healthy foods among parents (n=242)

Variable	B	SE	β
Attitudes (healthy food)	.52	.09	.34***
Injunctive norms (healthy food)	.37	.07	.30***
Private self-consciousness	.04	.02	.12
Observable (Yes=1, No=0)	-.05	.16	-.02
Observable * Private self-consciousness	.00	.03	.01
R^2 (adj.) %	**31.2%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 7.7 shows the results of an OLS model predicting behavioral intention to practice sun protection behaviors among parents, testing hypothesis 6 (n=225). The results show a significant positive main effect of attitudes (B =.47, β=.40, p<.001) and injunctive norms toward sun protection (B =.65, β=.46, p<.001) on intention. There was

no main effect of other-directedness (p >.05) or of observability of behavior (p >.05) on intention. Hypothesis 6 was not supported among parents in the sun protection sample; there was no significant joint effect of observability and other-directedness on intention to practice sun protection behaviors among parents of young children p> 0.05).

Table 7.7 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	**B**	**SE**	**β**
Attitudes (sun protection)	.74	.10	.40***
Injunctive norms (sun protection)	.65	.08	.46***
Other-directed	.00	.02	.00
Observable (Yes=1, No=0)	-.24	.17	-.06
Observable * Other Directed	.00	.03	.01
R^2 (adj.) %	**57.9%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

Table 7.8 shows the results of an OLS regression model predicting intention to practice sun protection behaviors among parents, examining hypothesis 7 (n=225). The results show a significant positive main effect of attitudes (B =.74, β=.40, p< .001) and injunctive norms toward sun protection (B =.63, β=.45, p< .001) on intention. There was no main effect of private self-consciousness on intention (p > .05). Observability of behavior did not have a significant main effect on intention (p >.05). The results for

parents in the sun protection survey did not support hypothesis 7. There was no significant joint effect of observability and private self-consciousness on intention to practice sun protection behaviors among parents of young children (p > .05).

Table 7.8 Results of OLS regression predicting intention to protect one's child from exposure to the sun (n=225)

Variable	B	SE	β
Attitudes (sun protection)	.74	.10	.40***
Injunctive norms (sun protection)	.63	.08	.45***
Private Self-Consciousness	.02	.03	.05
Observable (Yes=1, No=0)	-.24	.17	-.06
Observable * Private Self-Consciousness	.01	.03	.02
R^2 (adj.) %	**58.3%**		

Note. B = unstandardized coefficient; β= standardized coefficient.
* p < .05. ** p < .01. *** p < .001

7.10 Discussion

The results of this chapter show that, on the whole, hypotheses relating to interactions between personality traits and the observability of health behaviors were not supported. Only partial support was found for the hypothesis (hypothesis 6) that other-directedness would interact with observability in their joint effects on intention. This hypothesis was supported among parents in the survey relating to nutrition but not among parents in the sun protection survey.

In contrast to expectations, the joint effects of other-directedness and observability of behavior were most evident in the non-observable behavior condition (see Figure 7.2). Among parents who were *not* told that another parent could observe them preparing food for their child, those with higher levels of other-directedness were *less* likely to serve their child healthy foods than parents with lower levels of this trait. In contrast, under conditions in which parents *were* told that another parent was present in the play date scenario, there were no significant difference in intention between parents who had different levels of this trait.

An explanation for this result might be that other-directed parents, who are more attuned to the influence of others in forming intention, might also be more motivated to perform recommended health behaviors (i.e. serve healthy foods) when they have the incentive of being observed by another parent who will perceive them in a positive light for doing so. When this incentive is not present (i.e. in the non-observable condition), parents who are highly other-directed might, consequently, be less motivated to perform these health behaviors than parents who are less concerned with how they are perceived by others. For parents who are low in other-directedness the presence of another parent should not increase the likelihood of performing the recommended behavior.

However, it is worth pointing out that the interaction (see Figure 5.9) between other-directedness and the observability of behavior may not reflect a truly robust phenomenon. Taking into account the fact that only one of the four tests of these hypotheses was supported, together with the modest magnitude of the observed

interaction and its significance (beneath the .05 significance level but close to that value) the significant result of the test of hypothesis 7 may have been due to chance. Only further testing would reveal whether this interaction between other-directedness and the observability of behavior can be replicated among other samples, or in studies which explore other health behaviors. The finding does, however, provide some support for continued research into the interaction between personality traits which might interact with the effects of messages promoting healthy behaviors on intention. Future research should look at health behaviors not studied here, among different populations, and explore the effects of a variety of message cues.

CHAPTER 8

DISCUSSION AND LIMITATIONS

8.1 Discussion

The studies described in the previous chapters offer several preliminary findings on the effects of observability on the effects of social norms on intention and the interaction between exposure to normative and attitudinally focused messages and personality traits.

- The findings indicate that the manipulation of the public or private nature of the identical behavioral scenario – that is, the mention of the presence or absence of another parent who can observe the subjects' behavior – influences the effects of descriptive and injunctive norms on intention to perform sun protection behaviors. This priming effect was also shown to be specific to norms (rather than to attitudes or self-efficacy).
- There is evidence that the effects of normatively focused messages about nutrition are moderated by the extent to which parents identify with other parents of young children. Among parents with high levels of this trait, responses to a normative message led to significantly higher intention to perform healthy nutrition behaviors for their child, compared with parents with low levels of this trait.

- There is some evidence for the effects of an attitudinal message (vs. no message) among higher self-conscious people compared to the effects of an attitude message (vs. no message) among less self-conscious people. Parents who were categorized as having low levels of private self-consciousness reported significantly lower intention to serve their child healthy foods than parents with higher levels of this trait, following exposure to an attitudinally focused message, compared with no message.

The findings of the studies described here provide further support for the notion that social norms play an important role with regard to intention to perform healthful behaviors, which is consistent with previous research (see Finlay, Traffimow, & Villereal, 2002, Terry & Hogg, 1996, Fishbein, Trafimow, Francis et al. 1993; Fishbein, Trafimow, Middlestadt et al., 1995). In addition, the scale created to measure perceived group identification among parents was shown to moderate the effects of exposure to a message emphasizing normative motivations. This scale appears to operate well as a measure of the salience of social identity among this population. The study also contributes to the literature by providing empirical support for the notion that the public/private nature of a health behavior (sun protection) can prime the influence of social norms on intention among parents.

However, the studies did not show support for a number of hypotheses. For example, the findings did not show a significant interaction between observability and

exposure to a normatively focused message. In addition, messages emphasizing health outcomes (i.e. attitudinally focused) did not prime attitudes and messages emphasizing social expectations of others (i.e. normatively focused) did not prime social norms. There was also no evidence of an interaction between other-directedness and exposure to a normatively focused message.

An evaluation of the results of the pilot study and the message-testing study, which were conducted in summer of 2009 and during the winter of 2009/2010, reveals a number of apparent inconsistencies, which warrant further consideration. First, the results of the pilot study showed robust support for the effects of the manipulation of observability of the behavioral scenario on intention (both for the main effects of observability, as well as the joint effects of observability and social norms on intention). This effect was seen across both the sun protection and nutrition groups. (The effects were somewhat stronger among participants recruited in July than among the combined sample which also included participants recruited in September.) However, in the second study, while support was found for a hypothesized interaction between observability and norms, there was no overall main effect of this factor, and no interaction between observability and message treatments. Second, the message-testing study showed some support for message-related hypotheses among parents in the nutrition groups, but there was a uniform lack of support for hypotheses related to the message manipulation for participants in the sun protection group.

There are a number of possible explanations for these inconsistencies. One factor which might account for the differences observed in the results of the nutrition and sun protection studies relates to the timing of the pilot study and the message-testing study and the effect of this on the two behaviors. Sun protection and nutrition behaviors are both preventive health behaviors which have a day-to-day characteristic with a long-term health impact. However, in contrast to nutrition behaviors, sun protection behaviors are more frequently performed in the summer months and the saliency of this topic to parents is consequently likely to vary with the season. This factor might account, in part, for the lack of support for hypotheses related to the effects of message treatments in the message-testing study among parents exposed to messages about sun protection. Among this group, the message may have been perceived as less relevant, given the frigid temperatures at the time, and consequently, participants may have been less engaged with processing the message and attended less to the manipulation. Messages about nutrition are not likely to be similarly affected by the timing of the second study. Participants in the nutrition survey did respond to messages in ways that were (for some hypotheses) consistent with expectations. If the second study was to be replicated in July, it might be probable that similar results would be observed across both behaviors.

Another factor which might help account for the inconsistent findings across the two studies relates to the study design. While both studies used similar questionnaires, among two-thirds of the participants in the second study, the survey included exposure to a two-part message prior to the observability manipulation (and to items measuring

Integrative Model constructs). Participants who had just been asked to carefully review the message slides may have been distracted as a results of processing the messages, and may not have paid sufficient attention to the intention measure which followed this stage (and included the observability manipulation). This might account, in part, for the differences in the effects of the observability manipulation across the two studies.

8.2 Limitations

The methods utilized in these studies enjoy the benefits of traditional experimental methods. Specifically, the randomization of participants to condition allows for confidence in the effects of the observability manipulation and the message type manipulation. An additional strength is that the studies focused on a non-college aged population of parents whose age ranged from 20 to over 50 years old, which is a population less frequently studied in the health communication literature. The study also uses a control group, which allows the comparison of the two message treatments to the control rather than to each other. Lastly, the use of an on-line sample allowed for a larger sample than would have been feasible in a laboratory study.

With these strengths in mind, some limitations bear mention, as well. For example, the outcomes of focus are restricted to sun protection and nutrition behaviors only, so that the findings presented here may not be generalizable to other health behaviors. Additionally, the measures here are based upon self-report and may not accurately represent parents' true intention to practice sun protection behaviors. The

measurement of self-reported intention regarding healthy behaviors is also likely to have been affected by social desirability, a problem typical of studies focusing on these outcomes. The measure of intention to serve healthy food, for example, was highly skewed, and is likely to reflect an overestimation by parents of their actual behavior in the scenario depicted.

As outlined by Gaines, Kuklinski and Quirk (2007), the on-line survey method suffers from a number of drawbacks, some of which should be noted here. The use of a 'one-shot treatment' such as the single message exposure that was carried out here reduces the likelihood of finding message effects. Researchers often compensate for this factor by using a strong treatment, arguing that it is the approximate equivalent of over-time exposure to a weaker stimulus in real life. In the case of the current study the manipulations used were fairly subtle, which may have reduced the likelihood of finding the interaction effects that were hypothesized to occur.

An additional drawback of on-line survey method is the potential bleed-over of effects from prior studies into the current study, which may occur as the result of the (potentially high) number of studies completed by panel participants recruited by survey sampling companies. Participants who receive the questionnaire described here after having completed several studies may be insufficiently attentive to the messages shown and to the other question items, which would affect the results of hypothesis tests.

Another limitation common to experimental study designs such as the design of this study is that the effects are likely to be short lived. However, as the goal of this study

is to provide new information about the effects of incorporating an observability cue in messages relating to healthy behaviors aimed at parents of young children rather than bring about a change in behavior among this population, this does not represent a serious limitation.

Other limitations of the study are related to the manipulations of observability and message type. As reported earlier (see Chapters 4 and 5), the results of the manipulation checks for these factors did show significant differences between groups in the expected direction and yet a substantial proportion of participants incorrectly recalled each of these manipulations. It is likely that some of the parents in these studies did not pay close enough attention to the intention measure or to the messages, which would reduce the likelihood of detecting the hypothesized interactions. Evidence to suggest that this may have occurred is the notably short duration time of some of the sample for the study (particularly in study 2). 4.6 percent of the sample were reported as having completed the entire survey module, which was expected to take up to 15 minutes, in 5 minutes or less (the mean completion time was around 12 minutes). These subjects were not retained for analysis as a result of this factor, but this does raise questions as to the validity of responses among some participants in the on-line survey panel.

An additional limitation of the study was that the Integrative model measures used were global measures of attitudes, norms and self-efficacy rather than specific beliefs. The accepted procedure for applying this model is to conduct an elicitation study, which was not carried out in this study, due to the highly specific nature of the behavioral

scenario (i.e. intention measure). The use of global measures may have reduced the likelihood of detecting the influence of observability and message type on norms and attitudes.

8.3 Directions for future research

The most intriguing finding of the research presented here relates to the effects of the public/private nature of a health behavior on the normative route to intention. Researchers such as Lapinski and Rimal (2005) have argued that behavioral privacy should be a likely moderator of normative influences (see also Bagozzi et al., 2000; Cialdini et al., 1990). However, this is the first study to experimentally manipulate this factor in the context of health behaviors among a non-college aged population. It will be important to attempt to replicate the effects of shown here will among alternative populations and predicting other behaviors of interest to public health practitioners. This line of research could contribute to existing research examining the role of norms in shaping intention to perform health behaviors, as well as guide practitioners who design messages promoting these behaviors.

Future research could employ different message formats to test the effects of observability. It might be that the effects of observability vary according to the type of message. For example, it may be possible to extend this line of research by carrying out a similar experiment but testing the effects of a visual manipulation of observability. This would make it possible to compare the effects of a message featuring a model

demonstrating a health behavior alone to the same message featuring the model alongside a companion who was observing the behavior.

Another possibility would be to create a public service announcement promoting a particular health behavior, or persuading the audience *not* to perform a behavior (smoking, drugs, alcohol use) in which a similar manipulation of observability was employed. For example, among an adolescent population it would be interesting to investigate whether exposure to a public service announcement aimed at reducing intention to smoke in which the behavior being modeled (for example, smoking) was shown in a public context (i.e. observable by another teenager) reinforces intention not to smoke among teens whose norms are opposed to smoking, but primes intention among teens whose norms are already predisposed toward this behavior.

With regard to studying the effects of personality traits on the normative and attitudinal routes to intention, the findings reported here are less robust than those for the observability manipulation. It may be that an alternative population might show different effects than those found among parents. Another possibility is that the on-line survey method led to panel fatigue among some participants, which is likely to affect responses to measures such as those used here to measure traits (which include a long list of response items and require close attention and consideration.) It may also be that an alternative measure of normative susceptibility might have been preferable than the measures chosen for these studies.

Finally, one of the more important priorities for extending this line of research should be to address some of the limitations described earlier. Care should be taken to try to reduce the impact of social desirability on responses to questions about health behaviors. A wider range of messages should be used and pre-testing of these messages should be more extensive than the methods used here. Additional demographics and individual level characteristics could be explored as possible additional moderators of the normative route to intention.

8.4 Conclusions

If the public/private nature of a behavior represents an influential cue in messages promoting healthy behaviors among parents of young children, the findings of this study may be an important first step in examining their effects. Health promoters may need to carefully consider the implications of creating messages in which the recommended behavior is portrayed in a public context among different populations to ensure that it does not have adverse effects on intention. More research is needed to test the effects of this factor in the health domain.

APPENDIX A

JUNE 2009 PRE-TEST QUESTIONNAIRE

Below is the letter that was sent to participants in the pre-test of intention measures that was carried out in June, 2009:

Hi,

I am preparing a survey for my dissertation thesis and would be very grateful to you if you could respond to some questions (it shouldn't take more than 5 minutes to fill in). My survey is about what parents of children who are (currently) aged five through nine years old (up to 10) do with regard to sun protection and nutrition, and how they might respond to different messages about this.

We know that some parents do these behaviors rarely, or not at all, while other parents do them more frequently. I am interested in whether you intend to do the following behaviors for your child during the current summer. Your answers will be kept strictly confidential so please be as honest as possible (note – there is no need to put your name on the forms – your response alone will be fine).

Your response will assist in the process of checking that the measures will work well among parents like yourselves when I run the survey in August.

Thank you for your assistance,

Please think of your child who is aged 5 through 9 when you answer the questions.

Scenario 1

Imagine you are in a local park or playground with your child (think of your child aged between 5 and 9, at their current age) on a typical summer (weekend) day at noon. You and your child are not accompanied by other family members or friends.

How likely are you that you would do the following?

Keep my child out of the sun as much as possibly (i.e. seek out shade)

Extremely unlikely likely									Extremely
1	2	3	4	5	6	7	8	9	10

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Extremely unlikely likely									Extremely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a shirt that covers his/her chest and arms

Extremely unlikely likely									Extremely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a hat

Extremely unlikely likely									Extremely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing sunglasses

Extremely unlikely likely								Extremely	
1	2	3	4	5	6	7	8	9	10

Scenario

Imagine you are home with your child (think of your child aged between 5 and 9) at 5pm on a typical Sunday evening. Your child (the child aged five through nine, at their current age) has a friend over for an afternoon play date, and you are about to prepare an evening meal for the children to eat.

[14]As you begin preparing the meal, your child's friend's parent arrives and you invite him/her to join you in the kitchen and stay until the children have had dinner.

Please list foods that you are likely (you can list more than one option – think of foods you might choose from in this particular scenario) to serve your child and his/her friend for their meal?

Meat / Main dish
1.
2.
3.

Side dishes / snacks
1.
2.
3.

Drinks
1.
2.

Dessert / other
1.
2

[14] *This sentence was included for approximately half the parents surveyed for this stage.*

APPENDIX B

RESULTS OF PRE-TEST WITH PARENTS (JUNE 2009)

Sun Protection

Scenario 1 – Playground/park – Not observable (N=8)

Behavior	**No. responses**	**Mean response** 1 = Extremely unlikely 10 = Extremely likely	**SDEV**
Keep child out of the sun	8	**5.50**	2.93
Sunscreen	8	**5.38**	2.77
Shirt that covers chest and arms	8	**6.63**	3.58
Hat	8	**5.50**	3.89
Sunglasses	8	**3.13**	1.89

Nutrition

Scenario 3 – Sunday- evening meal – Observable (n=18)

Meat / Main dish	**No. times listed**
Chicken / Ham / Turkey (includes lunchmeat, meatballs, meatloaf)	7
Hot dogs / Burgers	4
Pizza	2
Fish sticks / Chicken nuggets	2

Side dishes / snacks	**No. times listed**
Fruit (e.g. grapes, apples, etc.)	5
Vegetables or salad (e.g. carrots, broccoli etc.)	7
Potatoes / Corn	1
Pasta / Macaroni and cheese	4
Rice	2
Cheese / cheese sticks	4

Drinks	**No. times listed**
Water (tap or bottled)	7
Milk (whole/ skim /organic)	2
Juice	3
Lemonade (or other soda)	3

Dessert / Other	**No. times listed**
Cookies /brownies / cake	5
Crackers	1
Popsicles	2
Ice-cream	5
Fruit roll ups / granola or energy bar	2

APPENDIX C

PILOT STUDY
STUDY INSTRUMENT (JULY 2009)

ORDER OF SURVEY QUESTIONS

1. Demographic questions
2 Traits and moderators
3 Scenario (intention measure)
4 Manipulation check
5 Integrative Model questions

GROUPS

1. SUN PROTECTION – PLAYGROUND/PARK – OBSERVABLE
2. SUN PROTECTION – PLAYGROUND/PARK – NOT OBSERVABLE
3. SUN PROTECTION – BEACH – OBSERVABLE
4. SUN PROTECTION – BEACH – NOT OBSERVABLE
5. NUTRITION – PLAYDATE – OBSERVABLE
6. NUTRITION – PLAYDATE – NOT OBSERVABLE
7. NUTRITION – OUTING – OBSERVABLE
8. NUTRITION – OUTING – NOT OBSERVABLE

[Introduction: SUN PROTECTION (groups 1, 2, 3, & 4)]

"Please help us learn more about sun protection.

As you may know, sun protection behaviors vary widely. Some parents engage in sun protection behaviors for their children rarely, or not at all, while other parents do these behaviors more frequently. The present survey is part of a study that tries to discover some of the reasons why parents do or do not engage in sun protection behaviors for their child.

Specifically, we are interested in whether you intend to do perform a range of sun protection behaviors for your child during the coming summer and your personal opinions about these behaviors.

Please read each question carefully and answer it to the best of your ability. There are no correct or incorrect responses; we are merely interested in your point of view. Your answers to the questions in this survey are completely confidential and will never be shared with anyone. Your name cannot be connected to your survey response.

Thank you for participating!"

[Introduction: NUTRITION (Groups 5, 6, 7, & 8)]

"Please help us learn more about nutrition.

As you may know, nutrition behaviors vary widely. Parents vary widely in the quantity and type of foods and drinks that they give to their children at home and outside of the home. The present survey is part of a study that tries to discover some of the reasons why parents provide the types of foods and drinks that they do for their child.

Specifically, we are interested in whether you intend to give your child a range of foods and drinks at home or outside of the home, and your personal opinions about the nutrition you provide for your child.

Please read each question carefully and answer it to the best of your ability. There are no correct or incorrect responses; we are merely interested in your point of view. Your answers to the questions in this survey are completely confidential and will never be shared with anyone. Your name cannot be connected to your survey response.

Thank you for participating!"

Demographic questions: All participants

These questions are about your personal and family characteristics. As with all the questions in this survey, your answers are completely confidential and will not be shared with anyone.

Please answer every item.

How old are you?

18-29	o
30-39	o
40-49	o
50 or older	o

Please note the highest level of education you have reached?

8th grade or less	o
Some high school, but did not graduate	o
High school diploma or GED	o
Some College or 2-year degree	o
4-year college graduate	o
More than 4-year college degree	o

Are you currently… choose only one answer:

Employed for wages	o
Self-employed	o
Out of work, but looking for work	o
A homemaker	o
A student	o
Retired	o
Unable to work	o

Do you consider yourself to be Hispanic or Latino?

No	o
Yes	o

What is your race? Check all that apply:

White / Caucasian	o
African American / Black	o
Asian American	o
Native American / Alaskan Native	o
Native Hawaiian / Pacific Islander	o
Other	o

What is your current marital status?

Married	o
Unmarried couple, living together	o
Separated	o
Divorced	o
Widowed	o
Never been married, not currently living with a partner	o

What is your gender?

Male	o
Female	o

How many children do you have (living at home and aged up to 18)?

One	o
Two	o
Three	o
Four	o
Five or more	o

How many of your children are aged 5 through 9 (including age 9)?

One	o
Two	o
Three	o
Four or more	o
None	o

Please think of your <u>youngest child aged 5 through 9</u> for the purpose of responding to this survey (for example if you have a five year old child and a seven year old child please think of your five-year old child).

What is the gender of this child?

Male	o
Female	o

What is this child's age?

Five	o
Six	o
Seven	o
Eight	o
Nine	o

Is this child

Your oldest or your only child	o
A younger child with at least one older sibling	o
A twin or multiple	o

.How good would you say that this child's health is, generally?

Poor	o
Fair	o
Good	o
Very good	o

[The question below is only for parents in groups 1,2,3, & 4 (sun protection scenarios)]

Thinking back over previous years, how does this child's (think of your youngest child aged 5 through 9) skin tend to react to exposure to the sun?

tends to burn easily	o
tends to burn at first but then tan	o
tends to burn occasionally and tans slowly	o
rarely burns and always tans	o
never burns and tans quickly	o

[The questions below are only for parents in groups 5,6,7, & 8 (nutritional scenarios)]

What is this child's height (approximate)?

Please write in the number of feet and inches separately.

For example, if your child is 3'9" tall, write "3" in the feet space and "9" in the inches space

_____ feet

_____ inches

What is this child's weight? (approximate) _____ lbs

Compared to other children who are the same age and gender as your child (think of your youngest child aged 5 through 9), is your child

Very underweight	o
Underweight	o
About average weight	o
A little overweight	o
Very overweight	o

Trait Measures and Moderators: All participants

Other-Directedness

The following statements concern your perception about yourself in a variety of situations. Please indicate the strength of your agreement with each statement, using a scale in which 1 indicates strong disagreement, 5 indicates strong agreement, and 2, 3, and 4 represent intermediate judgments.

In the boxes after each statement, choose a (only one) number from 1 to 5 from the following scale:

1. **Strongly disagree**
2. **Disagree**
3. **Neither disagree nor agree**
4. **Agree**
5. **Strongly agree**

There are no "right" or "wrong" answers, so select the number that most closely reflects you on each statement. Take your time and consider each statement carefully.

- **Be sure to answer all items**
- **Never choose more than one number on a single item**

Item	Strongly disagree =1	Disagree = 2	Neither disagree nor agree = 3	Agree = 4	Strongly agree = 5
In different situations and with different people, I often act like very different persons	o	o	o	o	o
In order to get along and be liked, I tend to be what people expect me to be rather than anything else	o	o	o	o	o
I am not always the person I appear to be	o	o	o	o	o
I guess I put on a show to impress or entertain people	o	o	o	o	o
Even if I am not enjoying myself, I often pretend to be having a good time	o	o	o	o	o

I may deceive people by being friendly when I really dislike them	o	o	o	o	o
I would not change my opinions (or the way I do things) in order to please someone or win their favor	o	o	o	o	o
I feel a bit awkward in company and do not show up quite as well as I should	o	o	o	o	o
When I am uncertain how to act in social situations, I look to the behavior of others for cues.	o	o	o	o	o
My behavior is usually an expression of my true inner feelings, attitudes, and beliefs	o	o	o	o	o
At parties and social gatherings, I do not attempt to do or say things that others will like	o	o	o	o	o

Private Self-Consciousness

Please answer the following questions about yourself by choosing the appropriate circle. For each of the statements indicate how much each statement is like you by using the following scale:

3 = a lot like me
2 = somewhat like me
1 = a little like me
0 = not at all like me

Please be as honest as you can throughout, and try not to let your responses to one question influence your response to other questions. There are no right and wrong answers.

- **Be sure to answer all items**
- **Never choose more than one number on a single item**

Item	0 = Not at all like me	1 = a little like me	2 = somewhat like me	3 = a lot like me
I'm always trying to figure myself out	o	o	o	o
I often daydream about myself	o	o	o	o
I never take a hard look at myself	o	o	o	o
I generally pay attention to my inner feelings	o	o	o	o
I'm constantly thinking about my reasons for doing things	o	o	o	o
I sometimes step back (in my mind) in order to examine myself from a distance	o	o	o	o
I'm quick to notice changes in my mood	o	o	o	o
I know the way my mind works when I work through a problem	o	o	o	o
I think about myself a lot	o	o	o	o

Perceived group identification

The following statements concern your perception about yourself as a parent in relation to other parents of young children. Please indicate the strength of your agreement with each statement, using a scale in which 1 indicates 'not at all' and 7 indicates 'to a very great extent', and 2, 3, 4, and 5 represent intermediate judgments.

In the boxes after each statement, choose a number from 1 to 5 from the following scale:

1 = not at all
2 = very little
3 = somewhat
4 = to a great extent
5 = to a very great extent

Please be as honest as you can, and try not to let your responses to one question influence your response to other questions. There are no right and wrong answers.

- **Be sure to answer all items**
- **Never choose more than one number on a single item**

Item	1 = not at all	2 = very little	3 = somewhat	4 = to a great extent	5 = to a very great extent
How much do you identify with most of the other parents of young children that you know?	o	o	o	o	o
How much do you feel yourself as belonging to the group of people who are parents of young children?	o	o	o	o	o
How much do you get along with most of the other parents of young children that you know?	o	o	o	o	o
How much do you feel strong ties with most of the other parents of young children that you know?	o	o	o	o	o
How attached do you feel to most of the other parents of young children that you know?	o	o	o	o	o
How similar do you feel in terms of general attitudes and opinions to most of the other parents of young children that you know?	o	o	o	o	o

Other moderators and control variables

[THIS QUESTION IS ONLY FOR PARENTS RECEIVING THE NUTRITION INTENTION SCENARIO – GROUPS 5,6,7, & 8]

Please note the extent to which you agree or disagree with the following statements:

Item	Never	Rarely	Half of the time	Most of the time	Always
When your child (think of your youngest child aged 5 through 9) is at home, how often are you responsible for feeding him or her?					
How often are you responsible for deciding what your youngest child's (think of your child aged 5 through 9) portion sizes are?					
How often are you responsible for deciding if your child (think of your youngest child aged 5 through 9) has eaten the right kind of foods?					

[ONLY FOR PARENTS RECEIVING THE SUN PROTECTION INTENTION SCENARIO – GROUPS 1,2,3,4,5, & 6]

Please note the extent to which you agree or disagree with the following statements

Item	Never	Rarely	Half of the time	Most of the time	Always
When your child (think of your youngest child aged 5 through 9) is outdoors, how often are you responsible for protecting him or her from the sun (i.e. seeking shade)?					
How often are you responsible for deciding whether your child (think of your youngest child aged 5 through 9) should wear a hat or other protective clothing when outdoors and exposed to the sun?					
How often are you responsible for deciding if your child (think of your youngest child aged 5 through 9) should wear sunscreen when outdoors and exposed to the sun?					

ONLY FOR PARENTS RECEIVING THE NUTRITION INTENTION SCENARIO – GROUPS 5,6,7, & 8

Please note the extent to which you agree or disagree with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately agree	Strongly Agree
I eat a low fat diet						
I eat a low sugar diet						
I eat at least three servings of fruit per day						
I eat at least three servings of vegetables per day						

[ONLY FOR PARENTS RECEIVING THE SUN PROTECTION INTENTION SCENARIO – GROUPS 1,2,3, & 4]

Please note the extent to which you agree or disagree with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately agree	Strongly Agree
When out in the sun I regularly apply sunscreen with an SPF of 15 or more on myself						
When outside in summer I try to seek shade during the midday hours.						
When outside in summer I usually wear protective clothing (i.e. a shirt with sleeves)						
When outside in summer I usually wear a hat						
When outside in summer I usually wear sunglasses						

Behavioral Scenario – Intention Measure

[INTRODUCTION: (FOR ALL GROUPS)]

"We know that some parents do these behaviors rarely, or not at all, while other parents do them more frequently. We are interested in whether, in the scenario you will read, you would be likely to do the following behaviors for your child. Think of your youngest child who is aged 5 through 9 when you answer the questions.

Please take time to read the scenario carefully and to imagine yourself in the specific situation described.

Your answers are completely confidential. We appreciate your honesty and cooperation."

SUN PROTECTION - SCENARIO 1

GROUPS 1 AND 2

Imagine you are in a local park or playground with your child (think of your youngest child aged between 5 and 9) on a typical summer (weekend) day at midday.

[OBSERVABLE]
You are accompanied by friends - who are also parents of young children like yourself .

[NOT-OBSERVABLE] You are not accompanied by other family members or friends.

How likely are you that you would do the following? (answer every question)

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a shirt that covers his/her chest and arms

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a hat

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing sunglasses

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

SUN PROTECTION - SCENARIO 2

GROUPS 3 AND 4

Imagine you are at the beach with your child (think of your youngest child aged between 5 and 9) on a typical summer's day on the weekend at noon.

[OBSERVABLE]

You are accompanied by friends - who are also parents of young children like yourself.

[NOT OBSERVABLE]

You are not accompanied by other family members or friends.

How likely are you that you would do the following? (answer every question)

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a shirt that covers his/her chest and arms

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a hat

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing sunglasses

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

SCENARIO 3 – NUTRITION

GROUPS 5 AND 6

Imagine you are home with your child (think of your youngest child aged between 5 and 9) at 5pm on a typical Sunday evening. Your child has a friend over for an afternoon play date, and you are about to prepare dinner for the children to eat.

[OBSERVABLE ONLY]

As you begin preparing the meal, your child's friend's parent arrives and you invite him/her to join you in the kitchen and stay until the children have had dinner.

How likely are you to include the following foods in the meal you serve your child and his/her friend?

Food item	Extremely Unlikely									Likely
	1	2	3	4	5	6	7	8	9	10
Meat (e.g. chicken / ham / beef)										
Fish (e.g. tuna, salmon, shellfish)										
Hot dogs / hamburger / chicken nuggets										
Pasta / macaroni / rice / potatoes / sandwiches										
Pizza										
Water (bottled or tap)										
Milk (skim / soy / whole / organic)										
Lemonade / soda / juice										
Fruit (at least one serving)										
Vegetables (at least one serving)										

Cookies / brownies / Cake										
Ice Cream / popsicle										

SCENARIO 4 – NUTRITION

GROUPS 7 AND 8

Imagine you and your child (think of your youngest child aged between 5 and 9) are preparing to go on an outing on a typical weekend day and you are packing food and drinks to bring along for lunch.

[OBSERVABLE]

You will be accompanied on the outing by friends who are also parents of young children like yourself and will be eating lunch together.

[NOT OBSERVABLE]

You are not accompanied by other friends or family members and will eat lunch with your child.

How likely are you to include the following foods for your child to eat for lunch?

Food item	Extremely Unlikely									Likely
	1	2	3	4	5	6	7	8	9	10
Meat – grilled or baked (for example, chicken, ham, or beef)										
Fish (for example, tuna, salmon, shellfish)										
Meat – fried or pre-cooked (for example, hot dogs, hamburger, or lunchmeat)										
Side dish (for example, pasta, macaroni, rice, potatoes)										
Sandwiches										
Water (bottled or tap)										

Milk (skim / soy / whole / organic)										
Drinks other than milk/water (for example, lemonade, soda, or juice)										
Fruit (at least one serving)										
Vegetables (at least one serving)										
Dessert – baked (for example, cookies, brownies or cake)										
Dessert – frozen (for example, ice Cream or popsicle)										

Manipulation Check (observability)

[All participants]

Please think back to the scenario you read earlier and choose the option that most accurately describes who was (said to be) present in this scenario:

o	I was alone
o	I was with my child only
o	I was with my child and other friends who are parents of young children
o	I was with my child and my partner
o	I was with my child and other family members
o	I don’t recall

TRA / INTEGRATIVE MODEL MEASURES

Injunctive norms

[Introduction]

Please answer the following questions by choosing the number that best describes your opinion. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully and think of your youngest child aged 5 to 9 when you respond.

GROUPS 1 AND 2

Most parents of a child aged 5 to 9 like myself (who are important to me) think I should do the following this summer at the local park or playground on a typical summer's weekend day at noon.

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen with an SPF of 15 or more to my child (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a shirt that covers their chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 3 AND 4

Most parents of a child aged 5 to 9 like myself (who are important to me) think I should do the following this summer at the beach on a typical summer's weekend day at noon.

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen with an SPF of 15 or more to my child (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a shirt that covers their chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 5 AND 6

Most parents of a child aged 5 to 9 like myself (who are important to me) think I should give my child the following foods and drinks for dinner on a typical Sunday evening at home when the child has a friend over for a play date.

Meat – grilled or baked (for example, chicken, ham, or beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (for example, tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or chicken nuggets)

Disagree	1	2	3	4	5	6	7	Agree

Side dish (for example, pasta, macaroni, rice, potatoes)

Disagree	1	2	3	4	5	6	7	Agree

Pizza

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Drinks other than milk/water (for example, lemonade, soda, or juice)

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – baked (for example, cookies, brownies or cake)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – frozen (for example, ice Cream or popsicle)

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 7 AND 8

Most parents of a child aged 5 to 9 like myself (who are important to me) think I should give my child the following foods and drinks for lunch when we are together are on an outing on a typical weekend day.

Meat – grilled or baked (for example, chicken, ham, or beef)

Disagree	1	2	3	4	5	6	7	**Agree**

Fish (for example, tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	**Agree**

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or lunchmeat)

Disagree	1	2	3	4	5	6	7	**Agree**

Side dish (for example, pasta, macaroni, rice, potatoes)

Disagree	1	2	3	4	5	6	7	**Agree**

Sandwiches

Disagree	1	2	3	4	5	6	7	**Agree**

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	**Agree**

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	**Agree**

Drinks other than milk/water (for example, lemonade, soda, or juice)

Disagree	1	2	3	4	5	6	7	**Agree**

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	**Agree**

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	**Agree**

Dessert – baked (for example, cookies, brownies or cake)

Disagree	1	2	3	4	5	6	7	**Agree**

Dessert – frozen (for example, ice Cream or Popsicle)

Disagree	1	2	3	4	5	6	7	**Agree**

Descriptive norms

GROUPS 1 AND 2

Most parents of a child aged 5 to 9 like myself (who are important to me) will do the following this summer at the local park or playground on a typical summer's weekend day at noon.

Keep their child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen with an SPF of 15 or more to their child (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing a shirt that covers their chest and arm

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 3 AND 4

Most parents of a child aged 5 to 9 like myself (who are important to me) will do the following this summer at the beach on a typical summer's weekend day at noon.

Keep their child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen with an SPF of 15 or more to their child (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing a shirt that covers their chest and arm

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 5 AND 6

Most parents of a child aged 5 to 9 like myself (who are important to me) will give their child the following foods and drinks for dinner on a typical Sunday evening at home when the child has a friend over for a play date.

Meat – grilled or baked (for example, chicken, ham, or beef)

Disagree	1	2	3	4	5	6	7	**Agree**

Fish (for example, tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	**Agree**

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or chicken nuggets)

Disagree	1	2	3	4	5	6	7	**Agree**

Side dish (for example, pasta, macaroni, rice, potatoes)

Disagree	1	2	3	4	5	6	7	**Agree**

Pizza

Disagree	1	2	3	4	5	6	7	**Agree**

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	**Agree**

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	**Agree**

Drinks other than milk/water (for example, lemonade, soda, or juice)

Disagree	1	2	3	4	5	6	7	**Agree**

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	**Agree**

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	**Agree**

Dessert – baked (for example, cookies, brownies or cake)

Disagree	1	2	3	4	5	6	7	**Agree**

Dessert – frozen (for example, ice Cream or popsicle)

Disagree	1	2	3	4	5	6	7	**Agree**

GROUPS 7 AND 8

Most parents of a child aged 5 to 9 like myself (who are important to me) will give their child the following foods and drinks for lunch when they are together are on an outing on a typical weekend day.

Meat – grilled or baked (for example, chicken, ham, or beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (for example, tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or lunchmeat)

Disagree	1	2	3	4	5	6	7	Agree

Side dish (for example, pasta, macaroni, rice, potatoes)

Disagree	1	2	3	4	5	6	7	Agree

Sandwiches

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Drinks other than milk/water (for example, lemonade, soda, or juice)

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – baked (for example, cookies, brownies or cake)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – frozen (for example, ice Cream or Popsicle)

Disagree	1	2	3	4	5	6	7	Agree

Attitudes

Please read the following questions and circle one number in each row for each item. .

GROUPS 1 AND 2

My keeping my child (think of your youngest child aged 5 to 9) out of the sun during the midday hours at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My applying sunscreen with an SPF of 15 or more to my child (think of your youngest child aged 5 to 9), and reapplying as necessary at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

Making sure that my child (think of your youngest child aged 5 to 9), is wearing a shirt that covers their chest and arms at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My making sure that my child (think of your child aged 5 to 9), is wearing a hat at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My making sure that my child (think of your youngest child aged 5 to 9) is wearing sunglasses at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

GROUPS 3 AND 4

My keeping my child (think of your youngest child aged 5 to 9) out of the sun during the midday hours at the beach on a typical summer's weekend day would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My applying sunscreen with an SPF of 15 or more to my child (think of your youngest child aged 5 to 9), and reapplying as necessary at the beach on a typical summer's weekend day would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

Making sure that my child (think of your youngest child aged 5 to 9), is wearing a shirt that covers their chest and arms at the beach on a typical summer's weekend day would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My making sure that my child (think of your child aged 5 to 9), is wearing a hat at the beach on a typical summer's weekend day would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My making sure that my child (think of your youngest child aged 5 to 9), is wearing sunglasses at the beach on a typical summer's weekend day would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

GROUPS 5 AND 6

Please read the following questions and circle one number in each row for each item. .

My giving the following foods and drinks to my child (think of your youngest child aged 5 to 9) for dinner on a typical Sunday evening at home when the child has a friend over for a play date would be.

Meat (e.g. chicken / ham / beef)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Fish (e.g. tuna, salmon, shellfish)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Hot dogs / hamburger / chicken nuggets	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Pasta / macaroni / rice / potatoes / sandwiches	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Pizza	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Water (bottled or tap)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Milk (skim / soy / whole / organic)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Lemonade, soda or juice	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Fruit at least one serving)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Vegetables (at least one serving)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Cookies / brownies / Cake	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Ice Cream / popsicle	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

GROUPS 7 AND 8

Please read the following questions and circle one number in each row for each item.

My giving the following foods and drinks to my child (think of your youngest child aged 5 to 9) for lunch when we are on an outing on a typical weekend day would be.

Meat – grilled or baked (for example, chicken, ham, or beef)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Fish (e.g. tuna, salmon, shellfish)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or lunchmeat)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Side dish (for example, pasta, macaroni, rice, potatoes)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Sandwiches	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Water (bottled or tap)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Milk (skim / soy / whole / organic)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Drinks other than milk /water (for example, lemonade, soda, or juice)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Fruit at least one serving)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Vegetables (at least one serving)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Cookies / brownies / Cake	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Ice Cream / popsicle	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Self-efficacy

GROUPS 1 AND 2

If I really wanted to, at a local park or playground with my child (think of your youngest child aged between 5 and 9) on a typical summer (weekend) day at midday, I could do the following:

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a shirt that covers his/her chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 3 AND 4

If I really wanted to, at the beach with my child (think of your youngest child aged between 5 and 9) on a typical summer's day on the weekend at noon, I could do the following:

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a shirt that covers his/her chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 5 AND 6

If I really wanted to, I could give the following foods and drinks to my child for dinner on a typical Sunday evening at home when the child has a friend over for a playdate:

Meat – grilled or baked (for example, chicken, ham, or beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (for example, tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or chicken nuggets)

Disagree	1	2	3	4	5	6	7	Agree

Side dish (for example, pasta, macaroni, rice, potatoes)

Disagree	1	2	3	4	5	6	7	Agree

Pizza

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Drinks other than milk/water (for example, lemonade, soda, or juice)

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – baked (for example, cookies, brownies or cake)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – frozen (for example, ice Cream or popsicle)

Disagree	1	2	3	4	5	6	7	Agree

GROUPS 7 AND 8

If I really wanted to, I could give the following foods and drinks to my child for lunch on an outing on a typical weekend day:

Meat – grilled or baked (for example, chicken, ham, or beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (for example, tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Meat – fried or pre-cooked (for example, hot dogs, hamburger, or lunchmeat)

Disagree	1	2	3	4	5	6	7	Agree

Side dish (for example, pasta, macaroni, rice, potatoes)

Disagree	1	2	3	4	5	6	7	Agree

Sandwiches

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Drinks other than milk/water (for example, lemonade, soda, or juice)

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – baked (for example, cookies, brownies or cake)

Disagree	1	2	3	4	5	6	7	Agree

Dessert – frozen (for example, ice Cream or Popsicle)

Disagree	1	2	3	4	5	6	7	Agree

APPENDIX D

QUESTIONNAIRE FOR PRE-TEST OF MESSAGES WITH PARENTS

(OCTOBER AND NOVEMBER 2009)

Message type: Attitudinal / Normative / Both

Behavior: Nutrition / Sun

Respondent (initials): _____

Male / Female: _____

1. What did the message say?

2. What reasons were given for doing the behavior?

3. To what extent did the message describe the health benefits of sun-safety / healthy nutrition[15] for your child

    a. I don't remember
    b. The message didn't mention this
    c. A little
    d. Somewhat
    e. There was a strong emphasis on this aspect

[15] This varied according to the message shown to the participant.

4. To what extent did the message mention that, as a parent, there are expectations from people around you to keep your child protected from the sun / serve them healthy food?

    a. I don't remember
    b. The message didn't mention this
    c. A little
    d. Somewhat
    e. There was a strong emphasis on this aspect

5. Did you find the images appealing? If not, why not?

6. Was this message persuasive? Did it change your mind about sun protection / nutrition for children or reinforce your intentions?

7. Did you relate to the people in the pictures? How similar are they to you? How similar are they to other people you know? Other parents?

8. What would you change about the text if you could?

9. What would you change about the visual images if you could?

10. What did you like about the message?

11. What do you think you will remember about the message an hour from now?

APPENDIX E

RESULTS OF PRE-TEST OF MESSAGES (OCTOBER AND NOVEMBER 2009)

The responses to the pre-test carried out in October and November of 2009 among parents were, for the most part, very positive. Some parents provided very useful feedback with regard to the wording of the text in the messages and issues I should take into account when revising them. Examples of responses to the messages included statements regarding the need to acknowledge the difficulty that parents can face when attempting to persuade children to comply with health behaviors, which was then reflected in changes to the text in the messages. Another example of parent feedback was to include specific examples of healthy foods rather than mentioning categories of recommended foods. Parents found the images appealing and identified the adults in the images as 'realistic looking' parents.

Some respondents did note, overall, that they found the attitudinally focused messages to be more persuasive than the normatively focused messages. Their response was based on the expressed rationale that, for those individuals, healthy behaviors such as sun protection and nutrition were performed for the child's benefit rather than to create a positive impression on others. The reasoned action approach recognizes that attitudes and norms play a role in forming intention (and self-efficacy) and that the relative weight of each factor may vary across individuals and behaviors. However, in order to be able to compare the effects of the two message types, attempts were made, when revising the

messages, to ensure that the normatively focused messages were as equivalent as possible in perceived persuasiveness to the attitudinally focused messages. This was done in order to reduce the risk that a difference in overall persuasiveness of the two message types would adversely affect tests of the study hypotheses. However, this factor may have adversely affected the outcomes of the study.

APPENDIX F

STUDY 2 – MESSAGES

SUN PROTECTION - NORMATIVE MESSAGE

Children and sun protection: Some important facts

Getting modest amounts of sun exposure can be beneficial for your health. It can help your body make vitamin D, which is important to keep your bones healthy and can prevent some cancers.

But too much sunlight can be harmful.

Too much sun is **particularly harmful to very young children**, who should be kept out of direct sunlight. Protecting children from the sun not only prevents painful sunburn, it also significantly **reduces the risk of developing skin cancer later in life.**

Why protect against the sun?

Like other parents of young children, you want what's best for your child. You want your child to grow up in a healthy environment and learn healthy habits for life.

Just as you would protect your child from any danger or harm, it is also your responsibility to protect your child from the damaging effects of sun exposure.

Set a great example and show your family and friends how important sun protection for your children

How can you protect your child in the sun during the coming summer?

- When possible, **seek out shade** between 10am and 2pm, when the sun's rays are at their strongest.
- Make sure your child wears a **hat, sunglasses and protective clothing.**
- **Apply sunscreen with an SPF of 15 or more** and reapply several times during a day in the sun.

Sometimes it can be difficult to get your young child to cooperate with your efforts to protect them in the sun, but its worth making an effort.

Over time it will become easier.

Show your family and friends that you are a sun-safe parent

Protect your child from the sun's damaging rays when outdoors

SUN PROTECTION - ATTITUDINAL MESSAGE

Children and sun protection: Some important facts

Getting modest amounts of sun exposure can be beneficial for your health. It can help your body make vitamin D, which is important to keep your bones healthy and can prevent some cancers.

But too much sunlight can be harmful.

Too much sun is **particularly harmful to very young children**, who should be kept out of direct sunlight. Protecting children from the sun not only prevents painful sunburn, it also significantly **reduces the risk of developing skin cancer later in life.**

Why protect against the sun?

As a parent of a young child you know how important it is to make sure that your child grows up in a healthy environment and learns healthy habits for life.

Just as you would protect your child from any danger or harm, it is also your responsibility to protect your child from the damaging effects of sun exposure.

Protecting your child from the sun's damaging rays will benefit their health now and in the future

How can you protect your child in the sun during the coming summer?

- When possible, **seek out shade** between 10am and 2pm, when the sun's rays are at their strongest.
- Make sure your child wears a **hat, sunglasses and protective clothing.**
- **Apply sunscreen with an SPF of 15 or more** and reapply several times during a day in the sun.

Sometimes it can be difficult to get your young child to cooperate with your efforts to protect them in the sun, but its worth making an effort.

Over time it will become easier.

Sun-safety is best for your child's health

Protect your child from the sun's damaging rays when outdoors

NUTRITION - NORMATIVE MESSAGE

Set a great example – Show your family and friends how important feeding your child healthy food is to you.

Children and nutrition: Some important facts

Proper nutrition will help your child's normal growth and development. Your child's nutrition has a **long-term impact on their health** and risk of developing obesity and other related health problems later in life.

It is never too early to teach children the value of avoiding high fat and high sugar foods and the importance of fiber, calcium, iron and other minerals in the diet. **Understanding the value of and adapting a well-balanced diet at an early age has life-long benefits.**

Why is it important to provide healthy food choices for your child?

Like other parents of young children, you want what's best for your child. You want your child to grow up in a healthy environment and learn healthy habits for life.

Just as you would protect your child from any danger or harm, it is also your responsibility to help reduce the amount of unhealthy foods your child eats, and to provide them with healthy and nutritious food choices.

Show your family and friends how much you care about your child's nutrition

How can you help your child eat healthy foods?

- **Increase your child's intake of whole-grain and fruits and vegetables**. Include vegetables in cooked foods for meals, or add fruits as a topping to food or as a snack. Substitute whole grain breads, cereals and pasta for refined grains, such as white bread, and high-sugar breakfast cereals.
- **Reduce the amount of high-fat and high-sugar foods your child eats** (for example, sweets, sugary snacks, and sodas). Check the nutritional labels to help decide whether foods are healthy.
- **Encourage healthy choices without nagging**. Do not restrict food, but make sure to praise healthy choices your child makes.
- **Keep a variety of healthy foods in your home**. Kids tend to eat what is available. It is important to set an example yourself and eat healthy foods for your own snacks.
- **Sit down to family dinners at night as much as possible**. Try to reduce the amount of times you order take-out for your family or eat at fast food restaurants.

Sometimes it can be difficult to get your young child to eat a healthy diet, but it's worth making an effort.

Over time it will become easier.

NUTRITION - ATTITUDINAL MESSAGE

Feeding your child healthy foods will benefit their health now and in the future

Children and nutrition: Some important facts

Proper nutrition will help your child's normal growth and development. Your child's nutrition has a **long-term impact on their health** and risk of developing obesity and other related health problems later in life.

It is never too early to teach children the value of avoiding high fat and high sugar foods and the importance of fiber, calcium, iron and other minerals in the diet. **Understanding the value of and adapting a well-balanced diet at an early age has life-long benefits.**

Why is it important to provide healthy food choices for your child?

As a parent, you want what's best for your child. You want your child to grow up in a healthy environment and learn healthy habits for life.

Just as you would protect your child from any danger or harm, it is also your responsibility to help reduce the amount of unhealthy foods your child eats, and to provide them with healthy and nutritious food choices.

Feeding your child nutritious foods will help them grow up healthy

How can you help your child eat healthy foods?

- **Increase your child's intake of whole-grain and fruits and vegetables**. Include vegetables in cooked foods for meals, or add fruits as a topping to food or as a snack. Substitute whole grain breads, cereals and pasta for refined grains, such as white bread, and high-sugar breakfast cereals.
- **Reduce the amount of high-fat and high-sugar foods your child eats** (for example, sweets, sugary snacks, and sodas). Check the nutritional labels to help decide whether foods are healthy.
- **Encourage healthy choices without nagging**. Do not restrict food, but make sure to praise healthy choices your child makes.
- **Keep a variety of healthy foods in your home**. Kids tend to eat what is available. It is important to set an example yourself and eat healthy foods for your own snacks.
- **Sit down to family dinners at night as much as possible**. Try to reduce the amount of times you order take-out for your family or eat at fast food restaurants.

Sometimes it can be difficult to get your young child to eat a healthy diet, but it's worth making an effort.

Over time it will become easier.

APPENDIX G

STUDY 2 - STUDY INSTRUMENT (DECEMBER 2009 AND JANUARY 2010)

[Introduction - SUN PROTECTION - GROUPS 1,2,3,4,5 AND 6 - General information about the study]

"Please help us learn more about sun protection.

As you may know, sun protection behaviors vary widely. Some parents engage in sun protection behaviors for their children rarely, or not at all, while other parents do these behaviors more frequently. The present survey is part of a study that tries to discover some of the reasons why parents do or do not engage in sun protection behaviors for their child.

Specifically, we are interested in whether you intend to do perform a range of sun protection behaviors for your child during the coming summer and your personal opinions about these behaviors.

Please read each question carefully and answer it to the best of your ability. There are no correct or incorrect responses; we are merely interested in your point of view. Your answers to the questions in this survey are completely confidential and will never be shared with anyone. Your name cannot be connected to your survey response.

Thank you for participating!"

[Introduction: NUTRITION – GROUPS 7,8,9,10,11 AND 12 - General information about the study]

"Please help us learn more about nutrition.

As you may know, nutrition behaviors vary widely. Parents vary widely in the quantity and type of foods and drinks that they give to their children at home and outside of the home. The present survey is part of a study that tries to discover some of the reasons why parents provide the types of foods and drinks that they do for their child.

Specifically, we are interested in whether you intend to give your child a range of foods and drinks at home or outside of the home, and your personal opinions about the nutrition you provide for your child.

Please read each question carefully and answer it to the best of your ability. There are no correct or incorrect responses; we are merely interested in your point of view. Your answers to the questions in this survey are completely confidential and will never be shared with anyone. Your name cannot be connected to your survey response.

Thank you for participating!"

Demographic questions: All participants

These questions are about your personal and family characteristics. As with all the questions in this survey, your answers are completely confidential and will not be shared with anyone.

Please answer every item.

How old are you?

18-29	o
30-39	o
40-49	o
50 or older	o

Please note the highest level of education you have reached?

8th grade or less	o
Some high school, but did not graduate	o
High school diploma or GED	o
Some College or 2-year degree	o
4-year college graduate	o
More than 4-year college degree	o

Are you currently… choose only one answer:

Employed for wages	o
Self-employed	o
Out of work, but looking for work	o
A homemaker	o
A student	o
Retired	o

Unable to work	o

Do you consider yourself to be Hispanic or Latino?

No	o
Yes	o

What is your race? Check all that apply:

White / Caucasian	o
African American / Black	o
Asian American	o
Native American / Alaskan Native	o
Native Hawaiian / Pacific Islander	o
Other	o

What is your current marital status?

Married	o
Unmarried couple, living together	o
Separated	o
Divorced	o
Widowed	o
Never been married, not currently living with a partner	o

What is your gender?

Male	o
Female	o

How many children do you have (living at home and aged up to 18)?

One	o
Two	o
Three	o
Four	o
Five or more	o

How many of your children are aged 5 through 9 (including age 9)?

One	o
Two	o
Three	o
Four or more	o

Please think of your youngest child aged 5 through 9 for the purpose of responding to this survey (for example if you have a five year old child and a seven year old child please think of your five-year old child).

What is the gender of this child?

Male	o
Female	o

What is this child's age?

Five	o
Six	o
Seven	o
Eight	o
Nine	o

Is this child

Your oldest or your only child	o
A younger child with at least one older sibling	o
A twin or multiple	o

How good would you say that this child's health is, generally?

Poor	o
Fair	o
Good	o
Very good	o

[THIS QUESTION IS ONLY FOR PARENTS RECEIVING THE SUN PROTECTION INTENTION SCENARIO (GROUPS 1,2,3,4,5, & 6)]

Thinking back over previous years, how does this child's (think of your youngest child aged 5 through 9) skin tend to react to exposure to the sun?

tends to burn easily	o
tends to burn at first but then tan	o
tends to burn occasionally and tans slowly	o
rarely burns and always tans	o
never burns and tans quickly	o

[THE NEXT 3 QUESTIONS ARE ONLY FOR PARENTS RECEIVING THE NUTRITION INTENTION SCENARIO (i.e. GROUPS 7,8,9,10,11, & 12]

What is this child's height (approximate)?

Please write in the number of feet and inches separately.

For example, if your child is 3'9" tall, write "3" in the feet space and "9" in the inches space

_____ feet

_____ inches

What is this child's weight? (approximate) _____ lbs

Compared to other children who are the same age and gender as your child (think of your youngest child aged 5 through 9), is your child

Very underweight	o
Underweight	o
About average weight	o
A little overweight	o
Very overweight	o

Trait Measures and Moderators: All participants

Other-Directedness

The following statements concern your perception about yourself in a variety of situations. Please indicate the strength of your agreement with each statement, using a scale in which 1 indicates strong disagreement, 5 indicates strong agreement, and 2, 3, and 4 represent intermediate judgments.

In the boxes after each statement, choose a (only one) number from 1 to 5 from the following scale:

6. **Strongly disagree**
7. **Disagree**
8. **Neither disagree nor agree**
9. **Agree**
10. **Strongly agree**

There are no "right" or "wrong" answers, so select the number that most closely reflects you on each statement. Take your time and consider each statement carefully.

- **Be sure to answer all items**
- **Never choose more than one number on a single item**

Item	Strongly disagree =1	Disagree = 2	Neither disagree nor agree = 3	Agree = 4	Strongly agree = 5
In different situations and with different people, I often act like very different persons	o	o	o	o	o
In order to get along and be liked, I tend to be what people expect me to be rather than anything else	o	o	o	o	o
I am not always the person I appear to be	o	o	o	o	o
I guess I put on a show to impress or entertain people	o	o	o	o	o
Even if I am not enjoying myself, I often pretend to be having a good time	o	o	o	o	o

I may deceive people by being friendly when I really dislike them	o	o	o	o	o
I would not change my opinions (or the way I do things) in order to please someone or win their favor	o	o	o	o	o
I feel a bit awkward in company and do not show up quite as well as I should	o	o	o	o	o
When I am uncertain how to act in social situations, I look to the behavior of others for cues.	o	o	o	o	o
My behavior is usually an expression of my true inner feelings, attitudes, and beliefs	o	o	o	o	o
At parties and social gatherings, I do not attempt to do or say things that others will like	o	o	o	o	o

Private Self-Consciousness

Please answer the following questions about yourself by choosing the appropriate circle. For each of the statements indicate how much each statement is like you by using the following scale:

3 = a lot like me
2 = somewhat like me
1 = a little like me
0 = not at all like me

Please be as honest as you can throughout, and try not to let your responses to one question influence your response to other questions. There are no right and wrong answers.

- **Be sure to answer all items**
- **Never choose more than one number on a single item**

Item	0 = Not at all like me	1 = a little like me	2 = somewhat like me	3 = a lot like me
I'm always trying to figure myself out	o	o	o	o
I often daydream about myself	o	o	o	o
I never take a hard look at myself	o	o	o	o
I generally pay attention to my inner feelings	o	o	o	o
I'm constantly thinking about my reasons for doing things	o	o	o	o
I sometimes step back (in my mind) in order to examine myself from a distance	o	o	o	o
I'm quick to notice changes in my mood	o	o	o	o
I know the way my mind works when I work through a problem	o	o	o	o
I think about myself a lot	o	o	o	o

Perceived group identification

The following statements concern your perception about yourself as a parent in relation to other parents of young children. Please indicate the strength of your agreement with each statement, using a scale in which 1 indicates 'not at all' and 7 indicates 'to a very great extent', and 2, 3, 4, and 5 represent intermediate judgments.

In the boxes after each statement, choose a number from 1 to 5 from the following scale:

1 = not at all
2 = very little
3 = somewhat
4 = to a great extent
5 = to a very great extent

Please be as honest as you can, and try not to let your responses to one question influence your response to other questions. There are no right and wrong answers.

- **Be sure to answer all items**
- **Never choose more than one number on a single item**

Item	1 = not at all	2 = very little	3 = somewhat	4 = to a great extent	5 = to a very great extent
How much do you identify with most of the other parents of young children that you know?	o	o	o	o	o
How much do you feel yourself as belonging to the group of people who are parents of young children?	o	o	o	o	o
How much do you get along with most of the other parents of young children that you know?	o	o	o	o	o
How much do you feel strong ties with most of the other parents of young children that you know?	o	o	o	o	o

How attached do you feel to most of the other parents of young children that you know?	o	o	o	o	o
How similar do you feel in terms of general attitudes and opinions to most of the other parents of young children that you know?	o	o	o	o	o

Other moderators and control variables

[ONLY FOR PARENTS RECEIVING THE NUTRITION INTENTION SCENARIO – GROUPS 7,8,9,10,11 AND 12]

Please note the extent to which you agree or disagree with the following statements:

Item	Never	Rarely	Half of the time	Most of the time	Always
When your child (think of your youngest child aged 5 through 9) is at home, how often are you responsible for feeding him or her?					
How often are you responsible for deciding what your youngest child's (think of your child aged 5 through 9) portion sizes are?					
How often are you responsible for deciding if your child (think of your youngest child aged 5 through 9) has eaten the right kind of foods?					

[ONLY FOR PARENTS RECEIVING THE SUN PROTECTION INTENTION SCENARIO – GROUPS 1,2,3,4,5, & 6]

Please note the extent to which you agree or disagree with the following statements

Item	Never	Rarely	Half of the time	Most of the time	Always
When your child (think of your youngest child aged 5 through 9) is outdoors, how often are you responsible for protecting him or her from the sun (i.e. seeking shade)?					
How often are you responsible for deciding whether your child (think of your youngest child aged 5 through 9) should wear a hat or other protective clothing when outdoors and exposed to the sun?					
How often are you responsible for deciding if your child (think of your youngest child aged 5 through 9) should wear sunscreen when outdoors and exposed to the sun?					

[ONLY FOR PARENTS RECEIVING THE NUTRITION INTENTION SCENARIO – GROUPS 7,8,9,10,11 AND 12]

Please note the extent to which you agree or disagree with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately agree	Strongly Agree
I eat a low fat diet						
I eat a low sugar diet						
I eat at least three servings of fruit per day						
I eat at least three servings of vegetables per day						

[ONLY FOR PARENTS RECEIVING THE SUN PROTECTION INTENTION SCENARIO – GROUPS 1,2,3,4,5, & 6]

Please note the extent to which you agree or disagree with the following statements

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately agree	Strongly Agree
When out in the sun I regularly apply sunscreen with an SPF of 15 or more on myself						
When outside in summer I try to seek shade during the midday hours.						
When outside in summer I usually wear protective clothing (i.e. a shirt with sleeves)						
When outside in summer I usually wear a hat						
When outside in summer I usually wear sunglasses						

MESSAGE EXPOSURE

[INSTRUCTIONS TO PARTICIPANTS IN GROUPS 1 THROUGH 4 AND 7 THROUGH 10 PRIOR TO SEEING MESSAGES IN STEP 3 – ALL 8 OF THESE CONDITIONS SHOULD RECEIVE THESE INSTRUCTIONS]

"In the next two screens you will see a message. Please pay close attention to all parts of the message, including text and images.

In order for you to have enough time to look at the message at both screens, this section is set up so that the option of clicking to the next screen will be delayed for about 20 seconds.

Thank you for your attention"

[Following these instructions groups receive the message type that is listed in the table below:
Each message includes the two screens with image and text – with the 25 second delay for each screen before participants can move on to the next.]

GROUP #	**Behavior type**	**Message Type**	**Observable behavioral scenario / Not observable**
GROUP 1	Sun protection	Attitudinal	Observable
GROUP 2	Sun protection	Attitudinal	Not observable
GROUP 3	Sun protection	Normative	Observable
GROUP 4	Sun protection	Normative	Not observable
GROUP 5	Sun protection	No message	Observable
GROUP 6	Sun protection	No message	Not observable
GROUP 7	Nutrition	Attitudinal	Observable
GROUP 8	Nutrition	Attitudinal	Not observable
GROUP 9	Nutrition	Normative	Observable
GROUP 10	Nutrition	Normative	Not observable
GROUP 11	Nutrition	No message	Observable
GROUP 12	Nutrition	No message	Not observable

Behavioral Scenario – Intention Measure

[INTRODUCTION: All participants]

"We know that some parents do these behaviors rarely, or not at all, while other parents do them more frequently. We are interested in whether, in the scenario you will read, you would be likely to do the following behaviors for your child. Think of your youngest child who is aged 5 through 9 when you answer the questions.

Please take time to read the scenario carefully and to imagine yourself in the specific situation described.

Your answers are completely confidential. We appreciate your honesty and cooperation."

SUN PROTECTION - OBSERVABLE SCENARIO
[GROUPS 1, 3 AND 5]

Imagine you are in a local park or playground with your child (think of your youngest child aged between 5 and 9) on a typical summer (weekend) day at midday.

You are accompanied by friends - who are also parents of young children like yourself.

How likely are you that you would do the following? (answer every question)

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a shirt that covers his/her chest and arms

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a hat

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing sunglasses

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

SUN PROTECTION – NOT OBSERVABLE SCENARIO
[GROUPS 2, 4 AND 6]

Imagine you are in a local park or playground with your child (think of your youngest child aged between 5 and 9) on a typical summer (weekend) day at midday.

You are not accompanied by other family members or friends.

How likely are you that you would do the following? (answer every question)

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a shirt that covers his/her chest and arms

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing a hat

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

Make sure that my child is wearing sunglasses

Extremely unlikely									Extremely likely
1	2	3	4	5	6	7	8	9	10

NUTRITION - OBSERVABLE SCENARIO
[GROUPS 7, 9 AND 11]

Imagine you are home with your child (think of your youngest child aged between 5 and 9) at 5pm on a typical Sunday evening. Your child has a friend over for an afternoon play date, and you are about to prepare dinner for the children to eat.

As you begin preparing the meal, your child's friend's parent arrives and you invite him/her to join you in the kitchen and stay until the children have had dinner.

How likely are you to include the following foods in the meal you serve your child and his/her friend?

Food item	Extremely Unlikely									Likely
	1	2	3	4	5	6	7	8	9	10
Meat (e.g. chicken / ham / beef)										
Fish (e.g. tuna, salmon, shellfish)										
Hot dogs / hamburger / chicken nuggets										
Pasta / macaroni / rice / potatoes / sandwiches										
Pizza										
Water (bottled or tap)										
Milk (skim / soy / whole / organic)										
Lemonade / soda / juice										
Fruit (at least one serving)										
Vegetables (at least one serving)										
Cookies / brownies / Cake										
Ice Cream / popsicle										

NUTRITION – NOT OBSERVABLE SCENARIO
[GROUPS 8, 10 AND 12]

Imagine you are home with your child (think of your youngest child aged between 5 and 9) at 5pm on a typical Sunday evening. Your child has a friend over for an afternoon play date, and you are about to prepare dinner for the children to eat.

How likely are you to include the following foods in the meal you serve your child and his/her friend?

Food item	Extremely Unlikely									Extremely Likely
	1	2	3	4	5	6	7	8	9	10
Meat (e.g. chicken / ham / beef)										
Fish (e.g. tuna, salmon, shellfish)										
Hot dogs / hamburger / chicken nuggets										
Pasta / macaroni / rice / potatoes / sandwiches										
Pizza										
Water (bottled or tap)										
Milk (skim / soy / whole / organic)										
Lemonade / soda / juice										
Fruit (at least one serving)										
Vegetables (at least one serving)										
Cookies / brownies / Cake										
Ice Cream / popsicle										

Manipulation Check (Observability)

[All participants]

Please think back to the scenario you read earlier and choose the option that most accurately describes who was present in this scenario:

o	I was alone
o	I was with my child only
o	I was with my child and other friends who are parents of young children

TRA / INTEGRATIVE MODEL MEASURES

Injunctive norms

[Introduction: All participants]

"Please answer the following questions by choosing the number that best describes your opinion. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully and think of your youngest child aged 5 to 9 when you respond."

[GROUPS 1,2,3,4,5 AND 6]

Most parents of a child aged 5 to 9 like myself (who are important to me) think I should do the following this summer at the local park or playground typical summer's weekend day at noon.

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen with an SPF of 15 or more to my child (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a shirt that covers their chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

[GROUPS 7,8,9,10,11 AND 12]

Most parents of a child aged 5 to 9 like myself (who are important to me) think I should give my child the following foods and drinks for dinner on a typical Sunday evening at home when the child has a friend over for a play date.

Meat (e.g. chicken / ham / beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (e.g. tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Hot dogs / hamburger / chicken nuggets

Disagree	1	2	3	4	5	6	7	Agree

Pasta / macaroni / rice / potatoes / sandwiches

Disagree	1	2	3	4	5	6	7	Agree

Pizza

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Lemonade / soda / juice

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Cookies / brownies / Cake

Disagree	1	2	3	4	5	6	7	Agree

Ice Cream / popsicle

Disagree	1	2	3	4	5	6	7	Agree

Descriptive norms

[GROUPS 1,2,3,4,5 AND 6]

Most parents of a child aged 5 to 9 like myself (who are important to me) will do the following this summer at the local park or playground typical summer's weekend day at noon.

Keep their child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen with an SPF of 15 or more to their child (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing a shirt that covers their chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that their child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

[GROUPS 7,8,9,10,11 AND 12]

Most parents of a child aged 5 to 9 like myself (who are important to me) will give their child the following foods and drinks for dinner on a typical Sunday evening at home when the child has a friend over for a play date.

Meat (e.g. chicken / ham / beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (e.g. tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Hot dogs / hamburger / chicken nuggets

Disagree	1	2	3	4	5	6	7	Agree

Pasta / macaroni / rice / potatoes / sandwiches

Disagree	1	2	3	4	5	6	7	Agree

Pizza

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Lemonade / soda / juice]

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Cookies / brownies / Cake

Disagree	1	2	3	4	5	6	7	Agree

Ice Cream / popsicle

Disagree	1	2	3	4	5	6	7	Agree

Attitudes

[GROUPS 1,2,3,4,5 AND 6]

Please read the following questions and circle one number in each row for each item. .

My keeping my child (think of your youngest child aged 5 to 9) out of the sun during the midday hours at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My applying sunscreen with an SPF of 15 or more to my child (think of your youngest child aged 5 to 9), and reapplying as necessary at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

Making sure that my child (think of your youngest child aged 5 to 9), is wearing a shirt that covers their chest and arms at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My making sure that my child (think of your child aged 5 to 9), is wearing a hat at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

My making sure that my child (think of your youngest child aged 5 to 9) is wearing sunglasses at the local park or playground typical summer's weekend day at noon would be.

Useless	1	2	3	4	5	6	7	Useful
Unenjoyable								Enjoyable
Foolish								Wise

[GROUPS 7,8,9,10,11 AND 12]

My giving the following foods and drinks to my child (think of your youngest child aged 5 to 9) for dinner on a typical Sunday evening at home when the child has a friend over for a play date would be.

(*Please circle one number in every row for every item*)

Meat (e.g. chicken / ham / beef)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Fish (e.g. tuna, salmon, shellfish)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Hot dogs / hamburger / chicken nuggets	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Pasta / macaroni / rice / potatoes / sandwiches	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Pizza	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Water (bottled or tap)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Milk (skim / soy / whole / organic)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Lemonade, soda or juice	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Fruit at least one serving)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Vegetables (at least one serving)	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Cookies / brownies / Cake	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Ice Cream / popsicle	Useless	1	2	3	4	5	6	7	Useful
	Unenjoyable								Enjoyable
	Foolish								Wise

Self-Efficacy

[GROUPS 1, 2,3,4,5 AND 6]

If I really wanted to, at a local park or playground with my child (think of your youngest child aged between 5 and 9) on a typical summer (weekend) day at midday, I could do the following:

Keep my child out of the sun during the midday hours as much as possible (i.e. seek out shade)

Disagree	1	2	3	4	5	6	7	Agree

Apply sunscreen to my child with an SPF of 15 or more (and reapply as necessary)

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a shirt that covers his/her chest and arms

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing a hat

Disagree	1	2	3	4	5	6	7	Agree

Make sure that my child is wearing sunglasses

Disagree	1	2	3	4	5	6	7	Agree

[GROUPS 7,8,9,10,11 AND 12]

If I really wanted to, I could give the following foods and drinks to my child for dinner on a typical Sunday evening at home when the child has a friend over for a playdate:

(*Please circle one number in every row for every item*)

Meat (e.g. chicken / ham / beef)

Disagree	1	2	3	4	5	6	7	Agree

Fish (e.g. tuna, salmon, shellfish)

Disagree	1	2	3	4	5	6	7	Agree

Hot dogs / hamburger / chicken nuggets

Disagree	1	2	3	4	5	6	7	Agree

Pasta / macaroni / rice / potatoes / sandwiches

Disagree	1	2	3	4	5	6	7	Agree

Pizza

Disagree	1	2	3	4	5	6	7	Agree

Water (bottled or tap)

Disagree	1	2	3	4	5	6	7	Agree

Milk (skim / soy / whole / organic)

Disagree	1	2	3	4	5	6	7	Agree

Lemonade / soda / juice

Disagree	1	2	3	4	5	6	7	Agree

Fruit (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Vegetables (at least one serving)

Disagree	1	2	3	4	5	6	7	Agree

Cookies / brownies / Cake

Disagree	1	2	3	4	5	6	7	Agree

Ice Cream / popsicle

Disagree	1	2	3	4	5	6	7	Agree

MANIPULATION CHECK 2 – FOR MESSAGE EXPOSURE GROUPS

[SUN PROTECTION (For Groups 1 through 4)]

Please think back to the message about sun protection that you saw earlier (the message includes the first and second pages you saw which featured written text together with visual images of parents and children).

Please indicate whether you recall whether the message you saw included the following elements:

Facts about sun protection and children

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

Ways in which to protect children in the sun

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

Reasons why sun protection can benefit your child's health

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

The importance of setting a good example for others (such as family and friends) by protecting your child from the sun

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

An image or images of a parent with a child

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

[NUTRITION - For Groups 7 through 10]

Please think back to the message about nutrition that you saw earlier (the message includes the first and second pages you saw which featured written text together with visual images of parents and children).

Please indicate whether you recall whether the message you saw included the following elements:

Facts about healthy food and children

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

Ways in which to feed healthy foods to your child

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

Reasons why feeding your child nutritious foods can benefit your child's health

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

The importance of setting a good example for others (such as family and friends) by feeding your child healthy foods

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

An image or images of a parent with a child

Definitely do not Recall that									Definitely do recall that
o	o	o	o	o	o	o	o	o	o

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