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Message framing effects in the delivery of sleep hygiene information to parents of elementary and middle school children

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MESSAGE FRAMING EFFECTS IN THE DELIVERY OF SLEEP HYGIENE INFORMATION TO PARENTS OF ELEMENTARY AND MIDDLE SCHOOL CHILDREN

by

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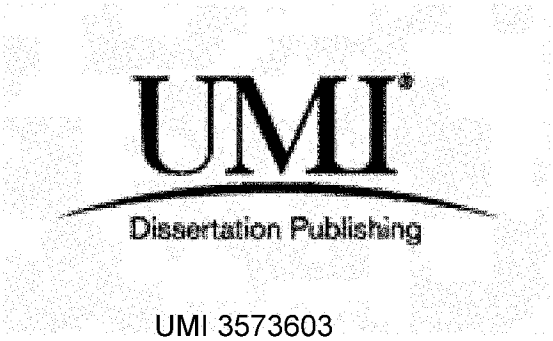

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ABSTRACT

In order to achieve all the benefits of sleeping, adequate quantity and quality of sleep are required, particularly for children and adolescents because of the issues of physical, emotional, and psychological development. Recent reviews of the literature have concluded children and adolescents consistently do not get enough sleep, and childhood sleep problems have serious negative effects on children and their families. Self-help guides have been proven to be effective, but the particular framing of the message is vital to its overall persuasiveness. Many researchers have found that these framing effects are important to the overall persuasiveness of a message. However, the interaction of message frame with individual characteristics of the decision-maker has not been explored in the way presented in this study. This study sought to determine what type of framing a factsheet regarding sleep in children and adolescents needs to have to induce the greatest amount of intended behavioral change, and what individual characteristics vis-à-vis dysfunctional parental discipline are related to message framing effects. Results showed expected correlational relationships between subscales of the Parenting Scale, with all other analyses lacking statistical significance. The current results are consistent with recent meta-analyses of the literature. Explanations for a lack of statistical significance are discussed.

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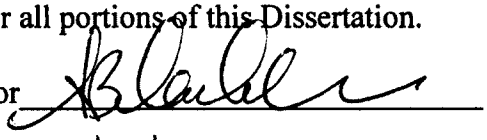
Author 

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CHAPTER ONE

INTRODUCTION

The typical human being spends a full one-third of his or her lifetime asleep. For something so critical to everyday existence, sleep research has yet to uncover the exact function of sleep (Dahl, 1996a; Tobler, 2000; Zepelin, 2000). Even determining what should be universal components of high quality sleep is difficult because sleep is so individualized. Sleep requirements are determined by genetic and physiological factors, influenced by age and sex, and affected by complex psychological, developmental, environmental, and social aspects of life. What is clear is that sleep is important for performing daily activities as well as an overall high quality of life (Owens, 2005; National Sleep Foundation, 2004).

In order to achieve all the benefits of sleeping, adequate quantity and quality of sleep are required. During all stages of sleep the body is remarkably active, using this time for muscle repair, memory consolidation, and the release of hormones that regulate processes such as growth and appetite. Sleep is structured as a series of repeated stages over the course of approximately eight to nine hours. About every 90 minutes, the body cycles through alternating stages of rapid eye-movement (REM) and non-rapid eye-movement (NREM) sleep. REM is the period of sleep during which dreams occur, the eyes dart back and forth under closed lids, and the body becomes immobile and relaxed.

This REM period of sleep first occurs 90 minutes after sleep has been initiated, lasts longer each cycle throughout the night, and is particularly important to performance the following day (Carskadon & Dement, 2000). If these cycles are cut short by some type of restriction in overall time allotted for sleep or fragmentation/disruption of the expected sleep period, an individual wakes up less prepared to function and usually perceives a sense of sleepiness, a lower quality of mood, and an overall reduced ability to complete important tasks at home, school or work (National Sleep Foundation, 2004; Owens, 2005).

Some expression of the most common form of sleep disruption, insomnia, is thought to affect approximately 30% of the U.S. population over a given year, with about 15% of adults reporting chronic insomnia, which is defined as symptoms of insomnia which last longer than one month (Ohayon, 2002). Insomnia can be a diagnosable disorder in and of itself, or indicative of some other underlying disease or emotional problem. The relationships between insomnia and other disorders can be complicated. Buysse et al. (2008) reported longitudinal analyses of insomnia and insomnia comorbid with depression. The results indicated that patients are at high risk for future episodes of the same diagnosis as well as future episodes of the other diagnosis (Buysse et al., 2008). Cognitive therapies, behavioral therapies and hypnotic medications are effective methods of coping with this very common sleep disturbance (Chesson et al., 1999).

Ensuring high quality and quantity sleep in a technological age is not a problem exclusive to adults. High quality sleep is also important for children and adolescents, with the issues of physical, emotional and psychological development added to the mix for the younger population. Unfortunately, the research on sleep in children is less complete than

research in adults, and all of the questions that remain for adult sleep also remain for children's sleep (Dahl, 1996a). Studying sleep in children requires a broad base of disciplines to adequately address the myriad effects sleep has on behavior in children, particularly when researchers have reported sleep problems in children and adolescents at anywhere from 20-70% (Dahl, 1996a; Liu, Liu, Owens, & Kaplan, 2005; National Sleep Foundation, 2004; Owens, 2005; Thompson & Christiakis, 2005; Zuckerman, Stevenson, & Bailey, 1987). Parents of preschoolers have reported sleep problems estimated to range from 25-50%, and in samples of children aged 4-10 parents reported sleep problems around 37% (Owens, Spirito, McGuinn, & Nobile, 2000). More than 40% of adolescents reported significant sleep complaints (Ohayon, Roberts, Zulley, Smirne, & Priest, 2000).

Recent reviews of the literature have concluded children and adolescents consistently do not get enough sleep, in part due to television and other electronic media influencing sleep at younger and younger ages. Also, as children age there are increasing academic demands and earlier school schedules affecting sleep patterns and practices. Childhood sleep problems—regardless of etiology—have serious negative effects on children and their families (Lahl & Pietrowsky, 2006; Owens, 2005; Thompson & Christiakis, 2005; Zuckerman, et al., 1987). For example, for children and adolescents sleep has been linked to learning, attention and other cognitive functions important for their development (Sadeh, Gruber, & Raviv, 2002; Sadeh, Gruber, & Raviv, 2003). Complicating matters of sleep research in children is that sleep behavior changes dramatically during the first few years of life depending on a wide variety of factors such as the culture of the family of origin and parental attitudes toward television watching

and computer use (Gianotti, Cortesi, Sebastiani, & Ottaviano, 2002; Liu et al., 2005; Owens, 2005; Thompson & Christiakis, 2005).

Healthy sleep in children looks much like healthy sleep in adults. Preschoolers, children aged between three and five years, typically need 11-13 hours of sleep per night. Generally, daytime naps cease after about five years of age. For this population, difficulty falling asleep and waking up during the night are common. This is generally attributed to the growing imaginations of this age group; larger and more complex imaginations create more powerful and disturbing nightmares. Correspondingly, this is the age when sleep walking and night terrors peak (Anders & Eiben, 1997; Mindell, Owens, & Carskadon, 1999). The American Medical Association and the Sleep Foundation of America both recommend regular and consistent sleep schedules for preschoolers. This includes a relaxing bedtime routine, sleeping in the same cool, dark and quiet environment every night, and not placing a television in the child's bedroom (Owens et al., 2000; National Sleep Foundation, 2004; Thompson & Christiakis, 2005).

For school-aged children, those aged between five and twelve years, the recommended amount of sleep is between 10-11 hours per night. Children this age are just beginning to see increasing demands on their time. Larger quantities of homework (Gau & Soong, 1995; Levy, Gray-Donald, Leech, Zvagulis, & Pless, 1986; Wolfson & Carskadon, 1998), increased demands of school schedules (Carskadon, 1990; Carskadon, Wolfson, Acebo, Tzischinksy, & Seifer, 1998; Gau & Soong, 1995) and extracurricular sports and other activities (Carskadon, 1989) all begin to place demands on the time of the school-age child that have the potential to interfere with sleep duration and quality. Also, at this age television, computer games, and use of media including the Internet are

factors of note regarding sleep (Owens, 2005; Thompson & Christiakis, 2005). Additionally, as children grow and gain independence, parents become further removed from directly controlling the bedtime (Carskadon, 1990; Ferber, 1995; Gau & Soong, 1995).

The influence of electronic media on the sleep behavior of children as well as the gradual removal of the parent from controlling bedtime is most accurate for parents from Western cultures because of the cultural emphasis on the development of individualism (Liu et al., 2005). Even when just evaluating American culture, parenting researchers understand the malleability of the parental view of the child. As Diana Baumrind (1966) wrote in her seminal article on models of parental control, "the practices favored by American parents to influence the actions and character of their offspring have varied from time to time, with the predominant view of the child as a refractory savage, a small adult, or an angelic bundle from heaven" (Baumrind, 1966, p. 888). She argued that many ideas about children, parents, and parenting come less from scientific research than religious values, a fact that she sought to change with her classification of parental authority into three models (Baumrind, 1966, 1967).

The three models Baumrind (1966) developed were permissive, authoritarian, and authoritative. She wrote the permissive parent "attempts to behave in a nonpunitive, acceptant, and affirmative manner toward the child's impulses, desires, and actions" (Baumrind, 1966, p. 889). The authoritarian parent however, "values obedience as a virtue and favors punitive, forceful measures to curb self-will" (Baumrind, 1966, p. 890). In contrast to these two more dysfunctional styles of parenting is the authoritative parent, who values both "autonomous self-will and disciplined conformity" (Baumrind, 1966, p.

890). It is when parenting styles like these transform into specific discipline practices, especially at bedtime, that an interaction of serious consequence can occur.

One of the most pervasive problems of sleep disruption in children is the effect on the parents and the overall functioning of the family unit. Zuckerman, et al. (1987) wrote, "persistent sleep problems are part of more pervasive pattern of behavioral difficulties between a parent and child involving limits and boundaries" (Zuckerman et al., 1987, p. 669). Parenting style and discipline practices have been linked to increased resistance and general noncompliance at bedtime, and otherwise competent parents may be poor limit-setters at bedtime because of fatigue or conflicting priorities (Zuckerman et al., 1987; Owens-Stively et al., 1997). For example, when a child is taking longer than 30 to 60 minutes to fall asleep, it is referred to as bedtime resistance or limit-setting disorder. This is exemplified by the child who often discovers many immediate needs just after the lights have been turned off and the parent has left the room. In these cases, situations may vary from parents who may not really want to set limits at all because the child being up at night provides a secondary gain for them (a sign of dysfunctional permissive discipline), to yelling and threats or actual physical punishments to achieve compliance (a sign of dysfunctional authoritarian discipline) (Ferber, 1987; Owens-Stively et al., 1997).

The interaction between bedtime resistance on the part of the child and limit-setting difficulties on the part of the parent(s) has led sleep researchers to describe a cyclical effect to childhood sleep problems and the corresponding sleep deficit in the parents or caregivers. When parents are suffering from sleep deprivation and/or fragmentation they are at risk for mood imbalances and the subsequent poor parenting that usually comes with it (Eckerberg, 2002; Owens-Stively et al., 1997; Thompson &

Christiakis, 2005) and even when a child does not feel she is suffering any symptoms of a sleep disorder the parents or caregivers may be suffering exponentially more in having to cope with the nighttime behaviors of the child (Ferber, 1987).

Aside from the relationship of poor parenting and sleep deprivation of parents or caregivers, poor or negative parenting (e.g., inconsistent discipline, harsh discipline, poor monitoring and poor supervision) is linked to both internalizing behaviors like depression and anxiety, and externalizing behaviors such as conduct problems and delinquency (Barry, Frick, & Grafeman, 2008). Additionally, families suffering with a sleep-disturbed child or adolescent are not functioning at their best, and are likely coping with the busy schedule of the modern family as well. Fortunately, there are interventions designed to change parental behaviors that have been linked to improvements in sleep in children (Owens-Stively et al., 1997).

Research has suggested that parent-training can be effective for parents of younger children in addressing some of the behavioral manifestations of sleep disturbance such as bedtime resistance and night-waking (Owens-Stively et al., 1997). In contrast to treatments for adults, medication for children to assist with sleep is generally without empirical support, even though the practice of using both prescription and over the counter medications for sleep is common (Owens, Rosen, & Mindell, 2003). Other types of interventions directed at the parents or caregivers that have proven effective include the use of a therapist in a clinic environment, therapists visiting the home, written information in parental guides or booklets, and group therapy (Eckerberg, 2002; Ferber, 1995; Galbraith, Hewitt, & Pritchard, 1993). However, many parents do not achieve attendance at the full number of planned therapy sessions regarding their children, and

between 20% and 80% terminate prematurely. This can be a significant disadvantage for family-based therapy or intervention programs, including behavioral parenting programs (Ingoldsby, 2010; Mah & Johnson, 2008; Nock & Kazdin, 2005).

Many sleep researchers have suggested that simple education regarding sleep related issues is an important possible intervention that can be undertaken by a variety of professionals who work with families such as teachers, school counselors, or pediatricians. Information regarding the sleep needs of children and adolescents as well as how television, computers, and extracurricular activities can affect the amount and quality of sleep is often recommended (Carskadon et al., 1998; Crowley & Carskadon, 2010; Hagenauer, Perryman, Lee, & Carskadon, 2009; Sadeh et al., 2003). Many authors have suggested providing parents, teachers, and even older children with information about the sleep process and how to ensure high quality sleep (Hagenauer et al., 2009; Owens, 2005; Wolfson & Carskadon, 2005), with some authors suggesting sleep education be worked into the academic curriculum of elementary and middle school students (Wolfson & Carskadon, 2005). Self-help guides, written to assist parents with a wide range of common problems other than sleep, have been proven to be effective (McMahon & Forehand, 1981). Eckerberg (2002) hypothesized that written information given to parents of children with sleep disturbances would be beneficial, and the author reported that in most cases the written information was enough to affect significant change in the sleep patterns of the child and resulted in satisfaction for the parents (Eckerberg, 2002).

With the need for sleep education so high, the fact that written information has been demonstrated to be effective takes on new salience. Brochures, pamphlets, and

factsheets are a realistic intervention particularly for today's busy families that remain available whenever the need for a review of the material is needed. However, the particular phrasing of the message is vital to the effectiveness of the overall message. This phrasing of a message is called framing. Framing as a concept in psychological science can be traced to the early 1980s, when Tversky and Kahneman (1981) published research on what they called the framing effect (Tversky & Kahneman, 1981). They reported that even when all the outcomes of a set of messages are objectively equal, individuals changed their response based on the framing of the particular message or problem. According to the authors, the difference in the wording of the message, or the frame, was whether or not the outcome was perceived as a relative gain or a relative loss to the individual, even though the outcomes were mathematically the same (Tverksy & Kahneman, 1981).

The perception of a decision being a relative gain to an individual decision maker is based on whether or not performing the action in the message will provide the decision maker with a beneficial outcome. This type of message, where the result is a beneficial one after the decision maker has performed the task or behavior in the message, is referred to as a gain frame message. A statement with a negative outcome, associated with not completing the task or not engaging in the behavior in the stated problem, is referred to as a loss frame. However, the relative effectiveness of gain frames versus loss frames is still inconsistent in the literature with some studies suggesting gain frames are more effective, but with other studies finding loss frames more effective. What is clear is that there are myriad individual qualities or characteristics of the decision maker that have the possibility of affecting the message framing process, and more research is

required to understand the effects these differences have. Some individual differences that have been investigated in the recent literature include gender, personality, self-esteem, self-efficacy, mood, and psychological reactance (Mahoney, Buboltz, & Levin, 2011). The goal of message framing techniques is to change an individual's attitude, behavior, or intentions to perform a behavior, and individual characteristics of decision makers modulate the relative effectiveness of message frames (Mahoney et al., 2011).

Statement of the Problem

Sleep difficulties affect between one-quarter and three-quarters of all children in the U.S. and are one of the most common behavioral challenges for parents (Chamness, 2008; Dahl, 1996a; Eckerberg, 2002; Ferber, 1987 & 1995; Gregory & O'Connor, 2002; Wolfson, 1996). The International Pediatric Sleep Education Task Force concluded in 2003 that there are significant gaps in knowledge for what parents and pediatricians believe is healthy sleep for children and adolescents (Thompson & Christiakis, 2005). Some authors have reported pediatricians giving contraindicated advice to parents struggling with sleep disturbances in their children, or simply suggesting that the child will "grow out of" the problem (Gianotti et al., 2002).

The adverse effects of inadequate sleep quantity or quality in children parallel the effects of sleep deprivation or fragmentation in adults regarding mood and overall sense of wellbeing. However, children and adolescents also show deficits in neurobehavioral functioning (NBF) that have the possibility of disrupting this population's most important task: performance at school. Alertness, memory, reaction time, behavioral inhibition, verbal creativity, and abstract thinking are among the skills that have been demonstrated

to be affected by sleep disturbance in children and adolescents (Gianotti et al., 2002; Sadeh et al., 2002; Sadeh et al., 2003).

The challenges of sleep problems can have even broader effects on behavior in children and adolescents. Sleep difficulties have also been linked to poor behavior regulation, behavior problems, affective and anxiety disorders, and early stages of psychopathology in children and adolescents (Gregory & O'Connor, 2002; Johnson, Cohen, Kasen, First, & Brooks, 2004; Sadeh et al., 2002; Thompson & Christiakis, 2005). Gregory and O'Connor (2002) report a link between persistent sleep problems in childhood and a diagnosable anxiety disorder in adulthood (Gregory & O'Connor, 2002) and others have reported that adult insomniacs started in adolescence (Laberge et al., 2001). Older adolescents are at even greater risk for sleep difficulties. Recent studies indicate that only half of 9^{th} and 10^{th} grade students get an average of even seven hours of sleep per night and that over 45% of adolescents obtain inadequate sleep (Carskadon et al., 1998; Ohayon et al., 2000).

One of the challenges of the modern family is achieving the difficult balance between high quality sleep in the children and all of the choices they have of what to watch, listen to or play. For example, on average children in the U.S. watch greater than nineteen hours of television per week. For young children, 75% of parents report television viewing as a usual part of their child's routine, with 90% of these parents believing that this television watching did not have a significant effect on the sleep of their child (Owens et al., 1999; Thompson & Christiakis, 2005). However, research has demonstrated the adverse effects of excessive television watching in children and adolescents include higher rates of obesity and aggressive behavior, decreased physical

activity, attention problems and sleep disorders. Additionally, cell phones and text messaging, computer video games, and the Internet are all becoming increasingly common in the hands of children and adolescents giving parents even more to worry about (Van den Bulck, 2004).

The nature of the modern family's busy lifestyle often precludes getting support or treatment for sleep disturbances. Behavioral and cognitive interventions are effective but time-consuming and dependent on intense therapist support, so an alternative is written information that a parent can refer to many times over in their own home, even with their child (Seymour, Brock, During & Poole, 1989). Though the data supports written information as an effective method of intervention for parents of children with sleep problems (Eckerberg, 2002; McMahon & Forehand, 1981; Seymour, Brock, During, & Poole, 1989), the message framing research indicates that tailoring the message frame to target specific individual characteristics of the message reader is emerging as an important factor in effectiveness.

Of particular importance to addressing quantity and quality of sleep in children is the parents' discipline style. This particular variable is important because it is both affected negatively by sleep disturbance in children and can be effectively modified to create behavioral change in the child (Owens-Stively et al., 1997; Scott & Richards, 1990; Seymour et al., 1989). Ineffective parenting has been linked to both internalizing problems, such as depression and anxiety, and externalizing problems, such as "acting out," or oppositional-type behaviors which are similar to the bedtime resistance that many parents experience (Arnold, O'Leary, Wolff, & Acker, 1993; Barry et al., 2008). At older ages, externalizing behaviors are associated with drug and alcohol abuse, family

violence, crime, and psychopathology (Arnold et al., 1993). Either type of behavior can increase the parenting burden and the level of family stress, which in turn affects the ability of a parent to maintain adequate levels of functional discipline. Poor parenting can undermine a child's ability to manage emotions, particularly negative emotions, which can then disrupt relationships with parents, teachers, and peers (Bell & Belsky, 2008).

The self-perpetuating nature of a child's sleep disturbance leading to family stress and dysfunctional parenting that then may in turn lead to increased bedtime resistance of the sleep disturbed child is a problem of significant importance. Sleep is vital to overall well-being, particularly in children as they grow and develop. Parents often are unaware of how to manage sleep disturbances, and even when they seek help can end up being misinformed about how to manage the behavior. Parents' own discipline style may even be affecting the perpetuation of the sleep disturbance. However, these issues are not impermeable to change and adaptation. Simply perusing an educational pamphlet or brochure can increase a parent's ability to manage sleep behavior in their children. What is not represented in the current literature is an investigation of how the usefulness of an at-home brochure or pamphlet can be combined with message framing techniques to target individuals with certain salient characteristics to make the message even more evocative of intended behavioral change.

Justification

The unfortunate juxtaposition of lack of knowledge about appropriate and healthy sleep for school children and adolescents, increased time required for homework, and nearly 24-hour access to entertainment media is contributing to an epidemic of children and adolescents that are at risk for significant deficits in academic performance as well as

long-term and ongoing mental health problems and sleep disturbances (Gianotti et al., 2002; Sadeh et al., 2002; Sadeh et al., 2003). With parents and pediatricians misinformed or under-informed about what appropriate sleep needs for children and adolescents are, even if a family presents for treatment for a sleep disturbance, they may not be getting the appropriate advice or recommendations (Gianotti et al., 2002; Thompson & Christiakis, 2005).

Additionally, children and families are busier than ever before, spending what little time they have together in the car driving from one activity to another, with more structured and controlled activities like sports and homework replacing independent free play time that was once used for children to connect to their parents (Hofferth, 2001). Children have access to entertainment media, often in their own bedrooms, nearly 24 hours per day, which contributes to an environment that tolerates inadequate quantity and quality of sleep (Van den Bulck, 2004). Behavioral and cognitive interventions are very effective, but also time-consuming and require intensive therapist support (Seymour et al., 1989). The best alternative for busy families coping with sleeping difficulties is an at-home, self-help educational brochure or pamphlet that can be referred to again and again. There is evidence that this type of self-help information can improve satisfaction specifically with sleep quantity and quality for parents and children (Eckerberg, 2002; McMahon & Forehand, 1981; Seymour et al., 1989). What is not known at this time is if message framing can be used support this type of intervention when the individual characteristics of the parent or parents are taken into account.

If children are expected to perform well at school, be healthy and well-adjusted members of their communities and families, then it is the responsibility of the parent to

assist them in one of the largest expenditures of time directly related to their overall well-being: sleep. Involving the parents is particularly important given the bidirectional impact between sleep problems and child development. Also, because sleep disturbances in children increase the parenting burden as well as overall levels of family stress (Doo & Wing, 2006; Mindell & Durand, 1993; Sadeh, et al., 2002), addressing the parental discipline style is an appropriate locus given the interaction of dysfunctional parental discipline with bedtime resistance. The message parents receive in a pamphlet needs to be phrased--framed--in such a way that it induces an intention for behavioral change. As Ajzen, Czasch, and Flood (2009) wrote, a simple direct measure of intention can account for substantial variance in actual behavior, and there is a growing body of literature on tailoring interventions to individual characteristics (Ajzen, Czasch, & Flood, 2009; Mann, Sherman, & Updegraff, 2004; Updegraff, Sherman, Luyster, & Mann, 2007). By briefly questioning patients about a particular characteristic through the use of a short questionnaire and then providing the client with the concordant health communication is a nominal added step for clinicians that could maximize the effectiveness of the persuasive message (Mann et al., 2004). This study sought to determine what type of framing a brochure regarding sleep in children and adolescents needs to have to induce the greatest amount of intended behavioral change, and what individual characteristics vis-à-vis dysfunctional parental discipline are related to message framing effects.

Review of the Literature

Sleep

The history of sleep medicine begins in the late 19th century with Gelineau's description of the clinical features of narcolepsy, a condition characterized by brief

attacks of deep sleep. Research in sleep hit another major milestone in the early 1920s when Kleitman reported the results of deprivation experiments, where he found that sleep deprivation leads to an increase in sleepiness (Dement, 2000; Leo-chiong, 2008). These early data seem obvious now, but it was only just over 80 years ago that Berger developed the system that is now standard in sleep medicine and sleep research: the electroencephalograph. This device, used to measure the brain waves of a sleeping person, forms the foundation of modern sleep science. From Berger's detection of Beta waves in 1930 through Aserinksi and Kleitman's report of REM (rapid eye movement) sleep (Leo-chiong, 2008), scientists and researchers of the 20th century and beyond have discovered volumes of information about one of the most fundamental of human behaviors: sleep (Dement, 2000; Leo-chiong, 2008). This plethora of information is held back by one important factor that still does not have an adequate theory behind it. The one question still unanswered by modern sleep research is, *why* do we sleep? Although this question is too complex to answer here, it belies the importance of ongoing study in this area given that as much as we do know, we still do *not* know some very important details.

Phylogeny is the study of origins or beginnings, and is often used to provide clues to function. In sleep research, studying the sleep behavior in animal models of both higher and lower order organisms provides data on possible evolutionary mechanisms for the development of sleep. Animal model sleep research has revealed some clues about why mammals sleep, the different mechanisms that have evolved for handling sleep needs and the regulation of sleep, and what lower order animals (reptiles, insects) experience in place of sleep. Because humans fall into the category of higher order

mammals, a review of the criteria for sleep and some of the theories about why mammals (including humans) sleep is appropriate (Zepelin, 2000).

Theories of sleep. Likely due to the peaceful appearance most people take while sleeping, early researchers interpreted sleep as a passive state of being, even going so far as to describe sleep as an intermediate stage between life and death (Dement, 2000). Some of the earliest theories focused on blood leaving the brain for other parts of the body in accounting for the onset of sleep, or "hypnotoxins" accumulating in the body (much like alcohol) and requiring sleep to dissipate them (Dement, 2000). The primary theory as to the function of sleep during these early formulations centered on restoration of some type, suggesting that sleep is for the relief of bodily deficits caused by being awake. This theory did not explain the variation in sleep architecture seen across species, from higher order mammals to reptiles and insects, so it has been undermined by other theories with a more evolutionary perspective. Sleep does have some restorative properties and there is a neutralization of neurotoxins similar to the earliest hypnotoxin theories, but more recent theories tackle issues of energy conservation as it relates to the mammalian "warm-blooded" or endothermic nature, and comparative theories focus on the assumption that sleep varies with the complexity of the brain and therefore may have cerebral functions (Zepelin, 2000).

The argument supporting the energy conservation theory relies on the mammalian need for a reduction in energy expenditure that goes below the level of simple rest. In this sense, sleep can be seen as a light hibernation or torpor, suggesting that sleep, torpor and hibernation are all related dormant states with some type of common purpose yet to be identified. It is unlikely that the reduction of metabolic rate is all there is to temporary

dormancy given that sleep only results in about a 15% metabolic savings in an average adult human male (Zepelin, 2000). There is evidence that a version of the energy conservation theory that focuses on sleep as enforced rest to set a limit on activity and total energy expenditure of the organism is more appropriate.

Beginning with Zepelin and Rechtschaffen's (1974) study on sleep parameters, life span, and other constitutional variables, correlational findings have repeatedly suggested sleep occurs to keep energy at an affordable (for the particular organism) level. For example, there is less pressure to sleep in larger species because they typically have greater energy reserves: fat can be up to 30% of the body mass of a species weighing 1000 kilograms. This affordable energy theory also accounts for the high-energy requirement of an endothermic physiology; compared to exothermic animals of similar size a mammal requires five times more energy. However, for some species, particularly those that never truly rest, like dolphins, this theory is also lacking in some regard (Zepelin, 2000).

Theories regarding maintenance of body temperature are associated with the energy affordability theory to the extent that during sleep, there is a general decline in body temperature (Glotzbach & Heller, 2000). During REM sleep, the body loses central temperature control, relying on arousal or environmental conditions to maintain temperature. Some theorists argue that this is a vestigial remnant from our evolutionary history as exothermic reptiles, because this type of sleep is the only type present in most cold-blooded reptilian species, and in many birds (Zepelin, 2000). During REM sleep the hypothalamic neurons appear to rest, giving the hypothalamus the ability to more accurately control temperature during waking hours (Glotzbach & Heller, 2000;

Parmeggiani, 2000). In contrast, when sleep is severely restricted, the ability of the body to maintain adequate body temperature is destroyed. In severe sleep deprivation studies in rats that eventually led to death, there was a significant decrease in the rats' ability to maintain adequate body temperature. They also doubled their food intake while constantly losing mass (Rechtschaffen & Bergmann, 1995; Rechtshaffen, Gilliand, Bergmann, & Winter, 1983). The exact association between sleep, thermoregulation, metabolism and the sleep-wake cycle is unknown, but research has demonstrated there are clear relationships between all of these factors that are vital to survival (Van Dongen & Dinges, 2000).

Some evolutionary-behavioral theories align with the energy conservation theory by suggesting that sleep is a sort of enforced rest period. Based on the observations that larger mammals require less sleep and require more time for foraging for food, some theorists believe that sleep developed as an "adaptive non-responding" to prevent activity when it would be dangerous or inefficient for an animal to do so. Other comparative theories focus on the dominance of instinctive behaviors in lower order animals and their relative lack of REM sleep. Unfortunately, the data does not bear out the logical conclusion that mammals with the most learning ability (as opposed to instinctual behaviors) such as primates would therefore have the greatest REM quotas, so this theory is incomplete as well (Zepelin, 2000).

What is sleep? Sleep often is identified by a few simple observations of the sleeper: a calm and tranquil state, eyes closed, usually in a (species-specific) relaxed body position in a quiet and relatively safe location. There are, however, required criteria for sleep that require a scrutiny beyond simple observation. These two criteria are the

ease of restorability to a more alert state, and the characteristic readings from an electroencephalogram (EEG). The EEG is able to document the changes in brain activity that only occur during sleep episodes (Carskadon & Dement, 2000). Additional sleep-monitoring devices include the electro-oculograph (EOG), which records eye movements, and electromyograph (EMG), which measures muscle tension, usually in the chin and neck. The three measures are collectively referred to as polysomnography (Carskadon & Rechtshaffen, 2000).

In terms of an adult human population, there are three states of being in regard to the sleep-wake experience: wakefulness, non-rapid eye movement (NREM) and rapid eye movement (REM). The state of wakefulness is characterized by alpha and beta wave reading on an EEG. Alpha waves are exhibited during the natural states of just awakening from sleep and just before sleep onset. This is a state of being awake, being relaxed, and of not processing many stimuli. Beta waves are characteristic of the general awake, active and alert state of being most people experience during the day when being productive. In simple terms, sleep is the absence of alpha and beta waves and the presence of theta waves; this point is broadly termed sleep onset (Carskadon & Dement, 2000). Humans enter sleep at a NREM stage, and cycle through stages of sleep (stages one, two, and three of NREM, and REM) several times over a night. The first REM does not occur until about 80 minutes after sleep onset. The sleeper will cycle through all stages every 90 minutes or so (Carskadon & Dement, 2000; Carskadon & Rechtshaffen, 2000).

Precise sleep onset is a difficult point to localize, and many researchers have different definitions of what readings from an EEG are required to suggest a pattern consistent with sleep. Part of the difficulty lies with human subjects. Subjects do not

always report feeling asleep when researchers rouse them at the point on an EEG reading when the rhythmic alpha waves have transitioned to a low-voltage, mixed frequency pattern characteristic of stage one sleep. It is for this reason that some researchers require the presence of the K-complex or sleep spindle (typical EEG patterns of stage two sleep) to acknowledge that sleep has begun. In addition, EMG levels may show a gradual reduction in readings but can be indistinguishable from readings when the subject is fully asleep if the subject is very relaxed. EOG readings indicate the onset of slow eye movement sometimes coincides with the subject's perception of being asleep, but not definitively (Carskadon & Dement, 2000).

K-complexes are negative sharp waves followed by a slower positive wave and are characteristic of stage two sleep. The K-complexes are associated with the sleep spindle, and both are generally required to appear within a three-minute span to indicate stage two has been reached due to the sporadic nature of their appearance on an EEG reading. In stage two, the K-complex is very easily distinguished from background activity, an important distinction from stage three when the K-complex may not be noticeable against the high-voltage, slow waves that characterize this last NREM stage (Carskadon & Rechtshaffen, 2000). Stage one sleep only lasts for a period of one to seven minutes and is associated with a low arousal threshold, meaning the sleeper can be easily awakened. Stage one also appears throughout the night as a transitional stage. Stage two follows stage one and lasts about 10 to 25 minutes. A stimulus in stage one that would produce arousal may only create a K-complex on an EEG reading but not awaken the sleeper during stage two (Carskadon & Dement, 2000).

The slow waves that characterize stage three are referred to as delta waves. This portion of the sleep cycle is when the sleeper experiences what is colloquially referred to as 'deep sleep' as this is the time when the sleeper is very difficult to wake. This slow wave sleep (SWS) is most prevalent in the early cycles during the night. Altogether, the NREM portion of sleep over a night is approximately 75% of the total sleep period. The first REM cycle of the night is very short, approximately one to five minutes, but gets longer in the later cycles of sleep period overnight, such that stage three may be eliminated altogether as the sleeper spend more time in REM and stage two (Carskadon & Dement, 2000; Carskadon & Rechtshaffen, 2000).

REM sleep was first identified by the behavior that originated the name of the stage, the rapid eye movements under closed lids that can be observed during sleep. More specifically, this stage is characterized by low-voltage reading from an EEG and an absence of muscle tone (with the exception of muscle twitches in the limbs and face) in addition to the eye movements. Other features of the REM sleep stage are an irregular heartbeat and changes in blood pressure. When awakened during this stage, 80% of subjects will report vivid dream recall. The absence of muscle tone mentioned above is thought to prevent self-injury during this time of dreaming. Carskadon and Dement suggest the shorthand for REM sleep to be, "a highly activated brain in a paralyzed body" (Carskadon & Dement, 2000, p. 16).

All of these sleep processes are governed by 24-hour, or circadian, rhythms (Turek, 2000). These rhythms serve as internal clocks and vary in length from hours (sleep), months (menstrual cycles), to years (puberty, menopause) (Strubbe & Woods, 2004). It was discovered in 1972 that destruction of portions of the hypothalamus, the

suprachiasmatic nuclei or SCN, leads to the loss of basic circadian rhythmicity. Since then, many researchers have focused on the neural basis for the generation of human circadian rhythms (Turek, 2000). However, these rhythms are known to be influenced by a variety of factors, including light, hormonal secretions, and social behavior (Czeisler & Khalsa, 2000).

Sleep in infants and children. Studying the sleep of infants and children requires a complex perspective. Internal factors, like the biological, developmental, medical ones that are specific to an individual child, as well as the external factors such as environmental, cultural, and familial, have to be considered (Sadeh & Anders, 1993). These factors, when taken together, focus on the role the parents and caregivers have in ensuring high quality sleep for children. The sleeping environment, scheduling of sleep, routines to prepare for sleep are practices commonly referred to as "sleep hygiene" and in this population are strongly dependent on the initiative and commitment of the parents and caregivers (Lebourgeois, Gianotti, Cortesi, Wolfson, & Harsh, 2005).

Across the lifetime of the individual, from birth to elderly adulthood, sleep physiology, architecture, regulation and distribution vary significantly (Lee-chiong, 2008). Regardless of the basic function of sleep, it is an extremely important process during early development. For example, during the first two years of a child's life, she will spend more time asleep than in all her waking behaviors combined (Dahl, 1996a; National Sleep Foundation, 2000; Wolfson, 1996). Infancy, childhood, and adolescence are periods of intense cognitive, physical, emotional change and development. Daytime activities, any change in the environment, and idiosyncratic personal factors can all affect the sleep of children. Subsequently, the patterns that children develop in their sleep

behavior affect their ability to think clearly, as well as manage their emotions and behavior during their waking hours (National Sleep Foundation, 2006; Wolfson, 1996). A basic understanding of the typical or normal sleep behaviors of infants, children and adolescents (and in particular the considerable changes that take place during this time) is vital to understanding the consequences of disrupted, fragmented, and restricted sleep in this population as it pertains to the current research.

The first detectable electrophysiological milestone occurs at 32 to 34 weeks gestation with the *tracé alternant* pattern of quiet sleep. From birth to approximately six months of age, infants gradually develop the typical adult pattern of sleep. By six months, infants have developed the distinct encephalographic pattern that allows differentiation into the standard three stages of NREM sleep (Leo-chiong, 2008; Wolfson, 1996). There are some significant differences between children and adults in regard to sleep behaviors. Newborn infants spend approximately 70% of a 24-hour day asleep, and adults spend about 25-35% of the day asleep. Infants typically acquire "nocturnal sleep consolidation," the ability to sleep through the night, at approximately six to nine months of age. In addition, until about three months of age, the infant experiences the equivalent of REM sleep first in the sleep cycle, whereas in adults the REM stage is at the end of the sleep cycle. At three months of age the adult pattern of NREM first followed by REM begins, but at a much shorter cycle length of approximately every 50 minutes (Lee-chiong, 2008; Wolfson, 1996).

At this time, however, the infant is still not experiencing standard adult NREM or REM sleep. Sleep in newborns qualifies as "polyphasic," or occurring several times throughout the day. The sleep stages of the very young infant, from birth to

approximately six months of age, are described as active, quiet, indeterminate, or transitional sleep stages. Active sleep is the first stage of sleep in infants and comprises a full 60% of all sleep in the newborn. This sleep behavior of frequent body and facial twitches with limb movements, rapid eye movements, and irregular breathing decreases to about 30% in a three-month-old infant and to about 20% of a child aged two to six years (Leo-chiong, 2008).

Quiet sleep in infants is characterized by minimal or the complete absence of body movements and with regular breathing. Polysomnography reveals that this stage is characterized by high voltage, slow wave EEG activity. Indeterminate sleep describes those stages of infant sleep that are not fully active or fully quiet, and transitional sleep describes those times when the infant is in transition between active, quiet, and indeterminate stages (Leo-chiong, 2008). The proportion of NREM to REM (or its equivalent in the very young infant) is equal, but declines throughout childhood. During early childhood, children spend most of their sleep in NREM stage three. This declines with aging until the adult pattern is reached in early adulthood (Leo-chiong, 2005; Wolfson, 1996).

Factors affecting sleep in infants and children. There are several factors that influence the development of sleep-wake patterns even at this early age. In general there are two types of infant: the "self-soothers" and the "signalers." These infants differ in their ability to settle, or to return to sleep when they awake during the nighttime sleep period. Self-soothers can do this without parental or caregiver assistance, but signalers cry out for parental attention and require it before they can settle again (Wolfson, 1996). Once the infant reaches the age of one to two years, developmental changes usually

include a parent or caregiver initiating routines at bedtime. These routines often include bathing, reading a story, singing songs, and taking what Winnicott (1953) terms a "transitional object" to bed (such as a blanket or stuffed animal). These routines facilitate behavioral associations with bedtime, increasing the consistency of a consolidated nighttime sleep period (Weissbluth, 1995; Winnicott, 1953; Wolfson, 1996).

Transitional objects are particularly useful at bedtime as they serve as a maternal substitute or psychologic representation of the mother and are often used during times of stress to provide comfort and security. Transitional objects are usually chosen by the infant and can lead to distress when absent. For many children, bedtime can be experienced as a stressful time of separation. There are two developmental periods that are particularly sensitive to separation and the associated need for a transitional object: when a child moves from attachment and dependency (less than one year of age, usually around nine months) to independence and autonomy (about three years of age, often corresponding with preschool or daycare) (Anders, Sadeh, & Appareddy, 1995). Transitional objects are associated with fewer sleep problems and disruptions and more self-soothing behaviors (Crowell, Keener, Ginsburg, & Anders, 1987; Wolfson, 1996).

Another major component of infant and toddler sleep that often extends through the preschool and even into the kindergarten years is napping. At about four months of age, an infant is taking two to three naps per day. By the time children reach 15 months of age, about 50% of toddlers will have reduced their napping to one nap per day. The length of the nap also decreases as children age, with infants at six months spending approximately three to four hours napping but decreasing nap duration until at 24 months 90% of toddlers nap for a total duration of one to three hours (Fukuda & Ishihara, 2001;

Wolfson, 1996). Children who nap may have longer attention spans and seem less "fussy." Some children will outgrow naps naturally, but for other children parents or caregivers will intervene to stop the child from napping for a variety of reasons. Depending on the age of the child, napping can often interfere with scheduled school or other activities, parents simply might prefer an earlier bedtime, or there may be stressful home events that prevent a regular napping schedule such that it is easier to eliminate them altogether (Wolfson, 1996).

The development of sleep-wake patterns is also influenced by the individual temperament of the child (Sadeh & Anders, 1993; Weissbluth, 1995), significant events surrounding pregnancy and birth (Anders, Keener, & Kraemer, 1985), developmental issues such as teething and separation anxiety (Ferber, 1985), the daily interactions and activities that a young child experiences (Dahl, 1996a; National Sleep Foundation, 2006; Wolfson, 1996), and the particular sleeping arrangements that a family chooses (Dahl, 1996a; Ferber, 1995; Sadeh & Anders, 1993; Wolfson, 1996). Sleeping arrangements are a particularly well-studied area in sleep research and can include the manner in which a child falls asleep, where exactly the child sleeps (with or without siblings, in their own bed or with the parents), and whether or not parents or caregivers are present at the time of falling asleep or if the child is left alone to fall asleep. Having an infant "room-in" at the hospital with the mother after delivery has been reported to result in more quiet sleep, less indeterminate sleep, and fewer spells of crying (Wolfson, 1996).

As children approach the age of four years and the associated introduction to a pre-school environment, an important developmental task is the control and regulation of their emotions. The daily activities of a preschooler or kindergartener now include

learning to adjust her own needs to the larger goals of a classroom and her peers. She now faces specific demands in regard to academic learning, paying attention, listening, and developing social relationships with a variety of people. At this age children may still need naps, mostly because daytime sleep is qualitatively different than nighttime sleep in regard to the relative amounts of REM/NREM during sleep sessions (Wolfson, 1996). Total sleep time declines from about 14 hours per every 24 to about 11-12 hours per every 24, and by the end of this stage most napping stops; however, night wakings remain common. It is important to recognize that these night wakings are only a problem when they disrupt the child's or the family's life. In particular, it is the child's response to being awake at night (rather than the being awake in and of itself) that is the problem. Children that have learned to self-soothe still wake at night, the parents and caregivers are just not aware (Chamness, 2008; Ferber, 1985 & 1987).

Sleep in adolescents. The biological development that occurs during adolescence underlies the cognitive, social and behavioral changes that take place. Nearly simultaneously, however, there are new social roles within the family of origin, a greater emphasis on independence, an increase in the importance of peers and social activity, and changes in responsibilities in regard to academics, sports, and other extracurricular activities. All of these factors coalesce into an extremely dynamic time both physically and emotionally for adolescents, and the sleep/wake patterns of adolescents are not free from this dynamism. Research by Carskadon, et al. (1980) indicates that adolescents require nine hours of sleep every night for optimal alertness during the day (Carskadon et al., 1980). Recent studies indicate that only half of 9th and 10th grade students get an average of even seven hours of sleep per night (Carskadon, et al., 1998; National Sleep

Foundation, 2006). The National Sleep Foundation found that over 45% of adolescents obtain inadequate sleep (National Sleep Foundation, 2000 & 2006). The unfortunate fact is that adolescents chronically do not get enough sleep. As a result, daytime sleepiness is a chronic problem for adolescents (Carskadon et al., 1980; Carskadon, 1990; Levy et al., 1986; Smith & Maben, 1993).

Some of the dramatic changes in sleep/wake patterns during adolescence include a decrease in sleep duration corresponding to a one to three hour delay in the timing of sleep (Carskadon, Viera, & Acebo, 1993; Carskadon et al., 1998), and an increasingly large discrepancy between weekday and weekend sleep patterns (Laberge et al., 2001; Strauch & Meier, 1988; Wolfson & Carskadon, 1998). Subjective sleep quality is reduced as well. Studies across Europe, Asia, and the United States indicate that between 6% and 37% of adolescents report difficulty on a variety of measures of sleep quality. Sleep related behaviors such as going to bed, falling asleep, maintaining sleep, returning to sleep after waking up at night, and feeling fully awake in the morning are all issues that adolescents cope with around the globe. In some studies, 16% of adolescents have presented with clinically significant insomnia (Lebourgeois et al., 2005; Strauch & Meier, 1988). This is because in early adolescence circadian patterns of sleep begin to change. Nearly every parent is familiar with what is commonly referred to as the "late and long" sleep recovery pattern (staying up late at night on school nights and then sleeping long into the morning on weekends) of the teenager, either through personal experience or the commonly held stereotype (National Sleep Foundation, 2000 & 2006; Wolfson & Carskadon, 1998). Recently research has indicated an organic, biological change is responsible for much of what was once attributed to the characteristic oppositional

behavior of this age group. The likelihood is that adolescent development is associated with both psychosocial and biological factors that push adolescents toward having later bedtimes and rising later in the morning the next day (Laberge et al., 2001; Levy et al., 1986; Carskadon et al., 1998).

Once thought to be strictly the "adolescent psychosocial milieu" (Crowley & Carskadon, 2010, p. 1471), it is now known that the adolescent tendency to go to bed later at night and then have difficulty waking early in the morning is part of a "biologically mediated phase-delay" linked to puberty (Carskadon et al., 1993; Laberge et al., 2001). Individuals can often be classified into their own individual propensity for "morningness" or "eveningness," the so-called morning "lark" or night "owl," respectively, and adolescents also experience this differentiation as well (Gianotti et al., 2002). However, both adolescent larks and adolescent owls show an age-related increase in eveningness. This biological push corresponds with the behavioral pattern of experiencing restricted sleep duration during the school week and then attempting to acquire extra sleep on weekends as a compensatory mechanism (Laberge et al., 2001).

Even though nearly all adolescents experience a biological phase delay, some differences among adolescents remain: adolescent evening-types (E-types) typically get less sleep on school nights than morning-types (M-types), and M-types get less sleep on weekends than E-types (Andrade, Benedicto-Silva, & Menna-Barreto, 1992; Gianotti et al., 2002). The E-type adolescent is more likely to experience daytime sleepiness, delayed bed and rise-time, shortened nocturnal sleep, and a greater need for weekend compensation sleep (Gau & Soong, 2003). Gau et al. (2007) reported in their study of 1332 students aged 12-13 years that eveningness might be an indicator of

psychopathology. After correcting for confounding factors, children in the group with the strongest eveningness ratings experienced more anxiety and depression than students with weaker eveningness ratings, as well as experiencing other emotional-behavioral problems including inattention, aggressive and delinquent behaviors, thought problems and social problems (Gau et al., 2007). Gianotti, et al. (2002) made similar conclusions, reporting significant prevalence of sleep problems in E-type subjects, (Gianotti et al., 2002). This delayed circadian phase is demonstrated even after several weeks of regulated schedules and under laboratory conditions where there is little chance of social influence (Hagenauer et al., 2009).

Puberty also comes with an ability to tolerate sleep pressure for longer. The homeostatic drive for sleep, also referred to as sleep pressure, increases the longer an individual is awake and then dissipates once the individual has slept (Hagenauer et al., 2009). Jenni, Achermann, and Carskadon (2005) reported that older adolescents were able to stay awake longer than children that have yet to reach puberty even though the recovery process during sleep episodes appears to remain the same (Jenni, Achermann, & Carskadon, 2005). By combining this ability to resist sleep pressure and the biological delay in circadian phase, Carskadon (2008) has developed a model of delayed sleep phase during adolescence: the resistance to sleep pressure allows adolescents to stay awake later at night, and the circadian delay provides the drive to stay awake later at night (Carskadon, 2008).

There is evidence in adults for circadian phase shifts as well. It is well known in sleep research that without any time constraints, the adult circadian cycle is closer to 25 hours than 24 hours. Often this leads to a gradual phase delay when people are on

vacation, which leads to a later bedtime and then later sleeping-in the following morning because when on vacation most people do not have the societal time constraints (such as work or school) typically experienced during their non-vacation days. Valdez, Ramirez and Garcia (1996) reported that adult subjects engaging in a five-day work week and two-day rest schedule did not achieve full synchronization with the artificially imposed sleep schedule most adults are required to follow (Valdez, Ramirez, & Garcia, 1996). In other words, when individuals forced themselves to go to bed early to prepare for getting up early the next morning for work or school, and then compensated on the weekends with extra sleep, they still experienced a tendency to stay up later at night even if they attempted to compensate on the weekend with extra sleep. Five days on a particular schedule and two days off that schedule is not enough time for the body to adjust, because the body naturally drifts a little each day. The authors argued that there are two effects working: free time during the weekends allows for additional rest and increased social activities, and when not being forced to get up for work or school, humans have a natural tendency to stay up later and approach a 25-hour circadian cycle (Valdez et al., 1996).

There are other neurobiological changes during adolescence. During adolescence there is a decrease in delta wave activity. Between the ages of 10 years and 20 years there is a 40% decrease in delta wave activity. This is thought to be part of the normal adolescent process of "cortical pruning," which is a general loss of cortical synaptic density. Another significant biological change at this age is the reduced latency of REM sleep (Carskadon et al., 1980). In general, these changes indicate a need for adolescents to obtain more sleep to function at previous levels but in reality adolescents frequently

obtain much less (Carskadon, 1990). This typically results in significant daytime sleepiness, which is also a frequent subjective adolescent complaint. Given the symptomology for other psychiatric disorders that frequently occur in this population (i.e., major depressive disorder), it is important for the nature of the sleepiness to be evaluated. The subjective feeling of sleepiness could be experienced as a difficulty staying awake, a general sense of fatigue, or a decreased interest in activities. The frequency and duration of the feeling of excessive sleepiness as well as any particular situational factors need to be considered, but receiving an insufficient quantity of sleep, disturbed nocturnal sleep, and circadian schedule disorders can usually account for the sleepiness (Dahl & Carskadon, 1995).

As mentioned previously, adolescence is a time of extensive physical, emotional and social growth. Some of the interactions in regard to adolescent development and sleep are the relationships between sleep, emotional turmoil, and stress. Emotional turmoil and stress can affect the sleep system directly by causing difficulty falling asleep or dramatic dreams that cause disrupted sleep. Additionally, sleep deprivation caused by the aforementioned natural biological changes in circadian patterns can cause or exacerbate emotional difficulties. This is particularly true in modern Western adolescents who often follow erratic late night schedules. Also, consistent with other challenging exploratory or oppositional behaviors of this age group, experimentation with drugs, alcohol, and other substances can interfere with an adolescent getting enough high quality sleep (Dahl & Carskadon, 1995). Use of psychoactive substances is greater in individuals who are considered "evening-typed" which most adolescents become during this time of rapid development (Gianotti et al., 2002).

Another phenomena related to the emotionality of adolescence and its interaction with sleeping behaviors is focused on the adolescent's repeated attempts to modify his or her own sleep duration. In adolescents a cyclical pattern of "onset insomnia" can develop. This is a situation in which an adolescent attempts to adjust their sleep schedule against their natural tendency and goes to bed and tries to fall asleep earlier, possibly to correct their subjective experience of daytime sleepiness. Due to the nature of the pubertal phase delay, both M- and E-types will still likely experience difficulty in falling asleep. This creates a feeling of anxiety about not getting enough sleep and creates a perception of poor sleep quality. This cycle repeats itself such that an adolescent begins to experience anxiety even when preparing for sleep, creating even more of an inhibition to smooth sleep onset and restful sleep (Gianotti et al., 2002). Unfortunately, the E-type adolescent is at significantly greater risk for a variety of adverse effects, including poor school performance, more difficulty in adjusting to school life, attention problems, and falling asleep at school in the mornings. The pattern that both types of adolescents use to compensate, the aforementioned late and long weekend recovery schedule, is itself linked to poor academic performance, depressed mood, and an increase in risk-taking behaviors (Crowley & Carskadon, 2010; Gianotti, et al., 2002; Wolfson & Carskadon, 1998).

Factors affecting sleep in adolescents. Adolescence is a time of physical maturation. Second to this physical experience is the psychosocial experience of the adolescent and the increasing importance of independence, social interaction, peer pressure, extracurricular activities, and academic responsibilities, to name a few. Adolescence is a time of many changes and sleep patterns underlie all of those changes that manifest during waking hours, regardless of the particular domain of life. Often, to

cope with the myriad demands on their time, adolescents compensate by reducing their sleep duration and attempt to compensate with extra sleep on the weekends, which is referred to as weekend recovery sleep. (Carskadon, 1990; Crowley & Carskadon, 2010; Gau & Soong, 2003; Yang, Kim, Patel & Lee, 2005). Environmental and social factors have a significant influence on the lives of young people. Adolescents are often interested in becoming more independent and making their own decisions. This often comes with a decrease in parental monitoring of bedtime and time in bed. Older adolescents must cope with the increasing demands of academic requirements, social activities, extracurricular activities and employment and often the time pressure is relieved by reducing sleep duration (Carskadon, 1990; Crowley & Carskadon, 2010; Gau & Soong, 2003; Yang et al., 2005). When these social pressures are combined with the biological phase delay that occurs at puberty, significant disruptions in the sleep patterns of adolescents can occur.

As early as 1913, researchers were concerned about school children and sleep, and whether or not children were getting enough for optimum academic performance. When American and European children were compared by these early sleep researchers and found the Europeans to get slightly more sleep, researchers attributed the difference in part to school start times (Epstein, Chillag, & Lavie, 1998). When Tynjala, Kanna and Valimaa (1993) reported on the sleep habits of European students 80 years later, the sleep duration across countries varied significantly, partly attributable to cultural differences in school start times (Tynjala, Kanna & Valimaa, 1993).

Carskadon et al. (1998) reported on the effects of transitioning to an early school start time on 9th and 10th graders. Their data show a significant sleep deprivation and daytime sleepiness. In adjusting to the approximately one hour (8:25am to 7:20am) start

time change, students reported going to bed later, sleeping less, and shortened sleep latency. Physiological changes included later onset of melatonin secretion and increases in REM sleep (Carskadon et al., 1998). Late sleep onset and early wake times for school reduced the amount of time for sleep, which may contribute to decrements in academic performance (Crowley & Carskadon, 2010). Epstein et al. (1998) reported that 5th graders in Israel with early school start times had shorter overnight sleep duration and demonstrated more attention problems (Epstein et al., 1998). Gianotti et al. (2002) reported that adolescents, especially those who fall in the E-type, experienced extraordinary difficulty adjusting to the early demands of a school schedule (Gianotti et al., 2002).

Recent research indicates that many people interested in the idea of changing early morning school start times to later in the morning believe that positive outcomes are likely (Wolfson & Carskadon, 2005). Wolfson and Carskadon (2005) reported that 50% of those surveyed believed a change in the start time of high schools would lead to improved attendance, lower rates of tardiness, and an overall increase in the happiness of students. The authors reported nearly 30% of those surveyed believed a change would lead to better grades and increases in teacher satisfaction. Even with few negative outcomes predicted very few schools have delayed start times of local schools to any significant degree, with most citing after-school athletic practices being the major barrier. Other issues of concern include other after-school extracurricular activities, teacher and parent schedules, the expense of changing schedules particularly around busing, and child care issues for before and after school hours (Wolfson & Carskadon, 2005).

Given the high rates of understanding of the need for later start times but the low rates of school systems being able to overcome the obstacles, Wolfson and Carskadon argued for a collaborative approach between adolescent health researchers, school administrators, parents, teachers, and students in order to get adolescents more sleep. A significant portion of their recommendations concerned educating the community regarding sleep, sleep disorders, and the biological rhythms that govern sleep and in particular how theses rhythms change during adolescence. Additional recommendations included consideration of a variety of school schedules that will benefit both the sleep and daytime functioning needs of adolescents; developing a system for evaluating students that show clear disturbances in regard to their ability to arrive to school on time, maintain wakefulness during school hours, and perform as expected academically; developing sleep curriculums in middle school health and biology classes; and setting limits on the number of hours of homework required per night and evening school activities such as sports practices (Wolfson & Carskadon, 2005).

Television can affect the lifestyles of children and adolescents in a variety of ways. Some of these have more behavioral consequences than others, but all can have an affect on the sleep patterns that are required for children to be healthy (Thompson & Christiakis, 2005). Television watching, and more recently access to other types of media (computers, cell phones) have been linked with obesity and poor eating habits (Saelens et al., 2002), decreased physical activity and fitness (Gortmaker et al., 1996), and poor school performance (Owens et al., 1999). In many cases the link between obesity and television watching can be at the home environment level. Saelens et al. (2002) reported a significant relationship between the numbers of meals spent watching television and total

time watching television, which is linked with the development of obesity (Saelens et al., 2002). This study also supports previous research insofar as the more television subjects watched, the higher Body Mass Index they accrued (Gortmaker et al., 1996; Saelens et al., 2002).

The content as well as the quantity of television watched affects daytime behaviors and sleep behaviors, replacing more healthful behaviors with sedentary ones, and reducing the healthy fatigue that comes at the end of a physically active day. Watching television extensively and using other media limits the time that families have to interact socially (Owens et al., 1999). Unfortunately for parents, television is no longer the only option children and adolescents have to entertain themselves. Computer or television game playing, having a mobile phone, and using the Internet have all become easy ways for youth to access "entertainment media" (Van den Bulck, 2004).

Van den Bulck (2004) draws several powerful conclusions regarding the relationship between sleep and access to and use of entertainment media (Van den Bulck, 2004). Most importantly, Van den Bulck argues it is no longer sufficient to worry only about television viewing because other media play an important role in the lives of young people. Also, not only is the excessive use of electronics like computers and televisions an indicator of the possibility of disturbed sleep patterns, but just the presence of electronic devices in a child's bedroom can be used as an indicator of disturbed sleep patterns. In contrast, structured activities, such as participating on an after-school sports team, do not disrupt sleep patterns as unstructured leisure activities (like video game playing or television watching) do. The data also suggested that using the Internet was a

significant cause of secondary school students going to bed later and spending less time in bed (sleep restriction) (Van den Bulck, 2004).

Television watching also correlates with difficulty getting to sleep and staying asleep because of the bright light interfering with the body's typical release of sleep hormones (Kubota et. al., 2002; Laberge et al., 2001). Tazawa and Okada (2001) reported excessive light exposure from television-game playing contributes to general exhaustion and exhaustion of the muscles around the eyes. They also report excessive television-game players have increased rates of muscle stiffness in the head, neck, and shoulders (Tazawa & Okada, 2001). Though no interaction with the brightness of the display was found on sleep latency, Higuchi, Motohashi, Liu, & Maeda (2005) reported playing a computer video game before bedtime resulted in significantly increased sleep latency and significantly decreased subjective feelings of sleepiness (Higuchi, Motohashi, Liu, & Maeda, 2005).

Sleep and the family. Sleep problems are very common among children though most are behavioral, interactive and schedule-related (Chamness, 2008; Ferber, 1995; Liu, et al., 2005; Owens, 2005; Thompson & Christiakis, 2005; Zuckerman et al., 1987). According to Dahl (1996b), pediatric sleep disorders represent the most common behavioral problems facing most parents (Dahl, 1996b). The most common problem that parents of young children have is the management of bedtime behaviors and other issues related to sleep, such as night waking (Seymour et al., 1989). In general, this is more of a challenge for mothers than fathers as it is typically the mother who is responsible for most of the direct child rearing (Yeung, Sandberg, Davis-Kean, and Hoferth, 2001). Because mothers accept a higher proportion of parenting responsibilities, their patience is

more often compromised, leading to a more emotional style of discipline (Bronstein, 1984).

Though these problems present with a different nature at each stage of development from infancy through late adolescence or early young adulthood, no stage is exempt from potential problems. When a family with a young child presents for treatment for a sleep problem to their pediatrician or other clinical professional it is often the caregiver that has the concern, but not the child. In this sense, it is the parental perception of the problem that needs to be assessed (i.e., a problem in sleeping does not necessarily indicate a true sleep disorder) (Ferber, 1995; Zuckerman et al., 1987). Reviewing some common recommendations for sleep disorder assessment is illustrative of the myriad issues involved in childhood sleep and provides an interesting perspective on the challenges of maintaining healthy sleep practices with children.

Assessment. It is important to recognize that the actual sleeping behavior of a child can be technically considered normal, though occurring at times and in patterns that the parents or caregivers find problematic (Dahl, 1996b; Ferber, 1995). Complete and detailed sleep, general medical, and social histories are necessary. Psychological and developmental screenings along with a physical examination are also important to determine the age-appropriateness of certain sleep behaviors (Anders & Eiben, 1997; Dahl, 1996b; Ferber, 1995). Some important disruptive but usually age-limited disturbances are colic in early infancy, separation anxiety from about nine to fifteen months, and fears surrounding adjusting to a new pre-school at about three years (Ferber, 1995). It is important to know what is "normal sleep" at each stage so parents can be reassured as appropriate or referred as necessary (Chamness, 2008). Knowledge of the

current or most recent sleep pattern and presenting complaint are important details that need to be evaluated in light of the fact that there are different routes to the same symptomology (Dahl, 1996b; Ferber, 1995). Education may also be an important component of assessment for possible sleep disturbances. For example, infants spend roughly half of their time asleep in the adult equivalent of REM sleep and experience twitches and facial movements similar to an adult in this sleep stage. Because this may occur for fully half the time a child is sleeping, parents may be concerned that the child is not sleeping well. In addition, sleep cycles in young children are much shorter and the usual fluctuations in alertness can alarm parents due to their frequency. A parent or caregiver may feel the child is waking and pick her up in an attempt to soothe but actually cause a return to full alertness (Chamness, 2008).

The differences in perception of the problem between parent and older child can be addressed by discussing the nature, seriousness and specific details of the problem with the child (if possible) and adding to that any confirmation by the parents (Anders & Eiben, 1997). When both parents are present, important information can be learned about the dynamics in the family and the functions of certain behaviors the child may have acquired secondarily to the initial sleep disturbance. For example, Richard Ferber argues the difference between the primary involvement of a sleep disturbance (anything that can cause even a temporary disruption in usual sleep behaviors such as frightening cartoons or the anticipation of a upcoming holiday) and the secondary involvement of the effects of the disturbance on the family. A child's poor sleep may cause sleep deprivation in the parent(s) leading to parental anger, arguments with the child or spouse/partner, tension, threats, spankings – such that the child develops anxiety about sleep that becomes a

secondary problem, and is usually more ongoing than the initial primary cause (Ferber, 1987, 1995).

When parents significantly overestimate the amount of time the child spends awake when she should be sleeping or how much time the parents spend addressing the sleeping problems, it is important to consider this as an indication of the amount of distress they are experiencing. It is of clinical significance to consider the parents may be experiencing other problems in their spousal or partner relationship or with their work life that are difficult to discuss, so the parent displaces their concern onto the child. This is where comparing the child's nighttime sleep to their napping sleep or the differences in sleeping behaviors that may occur in different settings with different people present can be beneficial to identifying the presence of a true sleep disorder versus a challenging behavioral problem (Ferber, 1995).

Family Systems

It is also important to consider factors that may be distinctive to the specific parents or caregivers, such as the possible presence of certain mental health issues or unrealistic parenting priorities. It may be the case that the parents or caretakers are poor limit-setters or poor enforcers of rules in general (Thompson & Christiakis, 2005). It may be the case, as Zuckerman et al. (1987) wrote, "persistent sleep problems are part of more pervasive behavioral difficulties between parent and child involving limits and boundaries" (p. 689). In fact, there has been a demonstrated association between general daytime behavior problems and problems with sleeping (Zuckerman et al., 1987). It may be helpful for a clinician to view the family as a complex interactive system based in the genetic similarities between (biological) parents and their children, but with the

temperament and character of the child eliciting behavior from the parents towards the children in a cyclical fashion (Kitamura et al., 2009).

A systems orientation, according to Conger (1981) is based on three factors: the elements within a bounded unit of some type are interdependent, the activities of any one of these elements has a direct and/or indirect influence on the other elements of the system, and the elements are related through some type of feedback loop such that the actions of one element in the system eventually have an effect on itself (Conger, 1981). These types of systems can be evaluated on three different levels: the individual family member, the family system, and the community. Taking a step away from focusing on the "problem child" and exploring the cultural forces at work is integral to understanding the parenting style potentially at the root of the presenting problem.

Western culture emphasizes independence in child rearing, with a focus on the individual (Liu et al., 2005). For example, one of the most common Western cultural practices involves placing an infant to sleep in a crib or bed alone and allowing the child to fall asleep by herself (Lozoff, Wolf, & Davis, 1984). However, the "psychosocial and cultural contexts in which young children's sleep patterns and bedtime routines develop influence how sleep problems are defined" wrote Gianotti et al. (2002). Determining the cultural influences on a particular family system is important given that research has demonstrated parental involvement at the time of falling asleep was significantly associated with longer sleep latency, higher incidence of night wakings, and – as a consequence – shorter nighttime sleep duration for both the parent and the child (Gianotti et al., 2002). Parents from non-Western cultures may be resistant for cultural reasons to putting their child to sleep alone in her room, but the end result of a difficult bedtime and

frequent night wakings and reduced sleep duration for all is not culturally limited (Gianotti et al., 2002; Liu et al., 2005; Thompson & Christiakis, 2005).

A child not sleeping well means at least one parent is not sleeping well, and often the whole family is affected. This can directly affect the quality and quantity of parental sleep and result in fatigue and mood disturbances and lead to a decrease in effective parenting (Boergers, Hart, Owens, Streisand, & Spirito, 2007; Eckerberg, 2002; Ferber, 1995; Thompson & Christiakis, 2005). A parent's "parenting style" is one such aspect of parenting that is involved in this feedback loop between parent and child regarding bedtime resistance. Baumrind (1973) defined parenting style as the consistent patterns with which parents interact with their children along two dimensions: demandingness and responsiveness. Demandingness refers to the effort parents make to integrate the child into the family through expectation of behavior and disciplinary practices. Responsiveness is parental action that is supportive and consistent with the needs and demands of the child (Baumrind, 1973).

Baumrind (1966, 1973) used these dimensions to define three parenting styles: authoritative, authoritarian, and permissive. Authoritative parenting combines a high demand for maturity with a high degree of emotional responsiveness and warmth toward the child with a deep valuing of both autonomy and conformity; authoritarian parents have high demand for mature behavior with low levels of responsiveness toward the child with a corresponding valuing of strict obedience; and permissive parents have few demands regarding maturity but have high levels of responsiveness while attempting to be nonpunitive in any way (Baumrind, 1966).

Research examining the relationship between parenting style and outcomes has yielded consistent results. Parenting style has been found to be linked to a child's well-being in a variety of domains, including those related to social competence, academic performance, general psychosocial development and resistant or problem behaviors. In particular, authoritative parenting increased child and adolescent competence and adjustment in areas of academic achievement, mental health, and psychosocial competence with a reduced rate of resistant or problem behaviors (Steinberg, 1990). Generally, authoritative parenting has been found to be conducive to children's growth, development and psychological health (Maccoby & Martin, 1983). This parenting influence may continue to have an effect even when children and adolescents are no longer in daily contact with their parents (Lapsley, Rice, & FitzGerald, 1990). In general, research suggests that parental responsiveness predicts social competence and psychosocial functioning, while parental demandingness is associated with academic competence and behavioral control (Darling & Steinberg, 1993). Authoritative parenting has consistently been associated with both instrumental and social competence and lower levels of problem behavior in both males and females at all developmental stages (Maccoby, 1994). Children and adolescents from authoritarian families tend to perform moderately well in school and be less involved in problem behavior, yet they have poorer social skills, lower self-esteem, and higher levels of depression. Conversely, children and adolescents from permissive families are more likely to be involved in problem behavior and perform less well in school, but they have higher self-esteem, better social skills, and lower levels of depression (Darling, 1999).

Any particular family system is dealing with challenges idiosyncratic to their specific child, a fact that limits generalizability. However, a child that is excessively emotional or possesses a temperament that is principally active tends to experience higher levels of distress and a lower level of "soothability" (Owens-Stively et al., 1997). The feedback loop in a systems perspective with a child identified as the level of analysis may resemble a situation where a child with a general difficulty in modulating her own arousal leads parents or caregivers to not be stern at bedtime for fear of angering the child, which also leads to a quick response to the child during night wakings, creating a pattern of learned behavior on the part of the child and the parents. Nighttime wakings and late bedtimes may be reinforced by the contact parents provide at these times. This creates a cyclical situation that can be both initially created in part by a poor fit between parenting style and child temperament, or contribute to its continuation and exacerbation. In addition, this pattern can eventually interfere with the development of a normal diurnal sleep pattern and keep the child dependent on what is essentially a series of naps (Wolfson, 1996). This loop must be evaluated with the understanding that parents who are chronically sleep deprived may be more likely to perceive the behavior of their child in a negative light (Owens-Stively et al., 1997).

Sleep Pathology: What is Poor Sleep?

In 1975, Webb and Agnew asked if American society was chronically sleep deprived. They reported a comparative analysis in which children and adolescents from 1910 and 1963 were compared on total amount of sleep. In 1910, youth reported a total sleep duration of 1.5 hours longer than youth in 1963. In a 1937 study 50% of youth

surveyed indicated they did not feel well rested upon waking in the morning (Carskadon & Dement, 1981; Webb & Agnew, 1975).

In general, less than five to six hours of sleep per day for an adult is consistent with symptoms of sleep deprivation and is referred to as a sleep debt. How the sleep debt is generated is important to the associated reduction in alertness: performance tests for memory and alertness are worse after rapid sleep loss then when the sleep loss is accumulated over time (Sadeh et al., 2003). This data suggests the existence of some type of compensatory mechanism within the human sleep experience to either improve sleep quality when the body is experiencing chronic sleep shortages or learns to adapt to functioning with less sleep (Sadeh et al., 2003). Research by Devoto, Lucidi, Violani, and Bertini (1999) reported an increase in the slow wave sleep and sleep efficiency in subjects who had been placed on a sleep restricted schedule (Devoto et al., 1999). The authors described this effect as a "physiological compensatory mechanism that regulates sleep physiology in response to variations in sleep duration" (p. 451). Webb and Agnew reported in 1975 that under laboratory conditions when sleep was left unrestricted it showed a sharp increase in amount, and described the normal seven to eight hours usually reported as the day-to-day average as a chronic "sleep diet" (Carskadon & Dement, 1981; Webb & Agnew, 1975).

In the human brain, the prefrontal cortex, the location of our uniquely human "executive controls," is particularly sensitive to sleep deprivation, sleep disorders, or reduced alertness (Sadeh et al., 2003). Descriptions of frontal lobe functions include the ability to plan and coordinate actions and make choices amongst alternatives, to adjust actions as necessary in the face of new information, and to attend to the task at hand

without being distracted by extraneous interference. These constructs are difficult to test, so researchers have focused on tasks believed to be measure of the general function of the frontal lobe, such as creative thinking, verbal fluency, and temporal memory. Tests that have been used to assess frontal lobe functional impairment after sleep deprivation include Wisconsin Card Sorting Test (WCST), the Stroop task, and the Torrance Test of Creative Thinking (Jones & Harrison, 2001). Besides sleep deprivation, disruption during long sleep episodes is also problematic. Fragmented sleep is a combination of the number of times an individual is awakened during sleep, and the duration of wakefulness after sleep onset (Sadeh, Gruber, & Raviv, 2002).

Sleep disorders of childhood and adolescence. The DSM-IV classifies sleep disorders into four broad categories: primary sleep disorders, sleep disorder related to another mental disorder, sleep disorder due to a general medical condition, and substance induced sleep disorder (American Psychiatric Association, 1994). Some authors argue that other classification systems are more appropriate for work with children. Other diagnostic systems focus on dyssomnias, or sleep disorders characterized by insufficient, excessive or inefficient sleep. According to Anders and Eiben (1997), the International Classification of Sleep Disorders: Diagnostic and Coding Manual, published in 1990, differentiates dyssomnias based on the characteristics of the disorder that contribute to its continuation and is a better fit for discussing childhood sleep problems (Anders & Eiben, 1997). The *intrinsic* dyssomnias stem from causes within the body, the *extrinsic* dyssomnias are dependent on external factors to produce and maintain the disorder, and *circadian* dyssomnias are based on the inappropriate timing of sleep in a 24-day (American Sleep Disorders Association, 1990).

Extrinsic. The extrinsic or behavioral sleep disorders (BSD) are sleep onset association disorder, limit-setting disorder and adjustment sleep disorder, and represent the most common behavioral problems facing most parents (Dahl, 1996a). For children, sleep onset association disorder is typically related to those factors that she cannot control, such as falling asleep in a car seat or being rocked to sleep. In other words, the young child cannot ask to be left to fall asleep on her own and cannot help falling asleep when the body demands it even if the location is less than ideal. These problems are issues of development as well, as it is difficult for a parent or caregiver to tell when an infant, who may sincerely require parental assistance in returning to sleep, has grown to a point where difficulties in sleeping are habit related only (Ferber, 1987).

When a child is taking longer than 30 to 60 minutes to fall asleep, it is often referred to as bedtime resistance or limit-setting disorder. This is the child who often discovers many immediate needs just after the lights have been turned out and the parent has left the room. Necessities such as a drink of water, needing to use the bathroom, being too cold or too warm, or remembering something important to share with a parent, are all ways that children can resist bedtime. Ferber (1987) writes, "a child is not apt to go to sleep if he will not stay in bed, and he is not likely to go to sleep if the parents keep going back into his room to carry out his endless requests" (Ferber, 1987, p. 646). Situations vary greatly: parents may want to set limits for the child and do not know how, parents may also not really want to set limits at all as the child being up at night provides a secondary gain for them. Issues of depression, illness, or marital problems may be interfering with the desire to set appropriate limits. Ferber (1987) recommends educating the family on appropriate sleep behaviors, keeping in mind the nature of the limit-setting

problem in order not to exacerbate problems of neglect if the case is so extreme (Ferber, 1987).

An important distinction between this behavioral resistance and an actual inability to fall asleep needs to be made. For example, a child who is suffering from a sleep phase delay (a circadian dyssomnia) is truly not sleepy at a standard age appropriate bedtime. These children may present with the same behavioral resistance as a child without a phase delay (an extrinsic dyssomnia), but in fact cannot fall asleep at the time set for bed. In addition, Owens, Opipari, Nobile, & Spirito (1998) wrote, "children with behaviorally-based sleep disorders also often have significant sleep disturbance, with irregular sleep-wake schedules, and/or fragmented or insufficient sleep. Thus, they may present with daytime behavioral problems related to daytime sleepiness that are similar to those described in children with obstructive sleep apnea syndrome" (Owens, et al., 1998, p. 1178). The differential diagnosis process for sleep disorders is a complex system that needs to be navigated carefully by any clinician. If the child or adolescent is participating in a late and long sleep schedule (staying up late on school nights and sleeping in long on weekends) and feels well-rested after the extended weekend sleep, it is possible that they are suffering from delayed sleep phase syndrome and intervention will be different than the sleep hygiene and limit-setting parents can initially use to address the behavioral issues (Chamness, 2008; Ferber, 1987). As mentioned earlier, even when a child does not feel she is suffering any symptoms of a sleep disorder, the parents or caregivers may be suffering exponentially more in having to cope with the nighttime behaviors of the child. According to Ferber (1987), the most strictly behavioral disorders occur in emotionally normal children with normal physiology, and are caused by habits, associations, and the

usual limit testing of a particular age group. However, these behavioral problems often co-exist or present similarly with true medical or emotional problems and complicate the assessment, diagnosis, and treatment of the issue (Ferber, 1987).

Intrinsic. Some sleep problems in children are considered to be medical in nature and can have solutions that require medical intervention. For example, in children and adolescents, sleep onset or initiation can be disrupted by restless leg syndrome. Children often have difficulty describing the physical sensation other than to say they cannot get comfortable in bed or have an itchy or achy feeling in their legs (Chamness, 2008). Sleep maintenance issues in children and adolescents of a medical or organic nature need to be distinguished from behavioral issues. More specific than the general term dyssomnias, parasomnias are sleep disorders that are characterized by behaviors intruding upon ongoing sleep (Anders & Eiben, 1997). The most common are disorders of arousal, the disruptive nighttime behaviors that are classified in three categories: sleep terrors, confusional arousals, and sleepwalking (Anders & Eiben, 1997; Rosen, Ferber, & Mahowald, 1996; Rosen, Mahowald, & Ferber, 1995). These can be very disturbing to the parent or caregiver because the child is usually not aware of what is going on and can be very difficult to comfort. These three disorders share similar timing in the sleep cycle and important clinical features such as duration of the episode, presence of family history, amnesia for the episode, and degree of arousal (Anders & Eiben, 1997; Chamness, 2008).

Parasomnias typically occur during slow-wave sleep, such that anything that disrupts the depth and duration of sleep can exacerbate the problem in those children predisposed to arousal disorders. Maintaining a safe environment for the sleeping child

and educating parents and caregivers about the nature of the arousal disorder is important, though often the best advice for parents is to not intervene at all other than to keep the child from hurting herself or others. Extending sleep duration for as little as 30 minutes or addressing clear specific stressors can also help. In addition, older children and adolescents may experience arousal disorders as a response to emotional distress. Some type of psychological intervention may be appropriate in these situations. Similarly, nightmares can awaken a child at night but in these situations the child can be comforted and returned to bed with little difficulty (Chamness, 2008; Rosen et al., 1996). As a last resort, medications can used as a short-term treatment when the child appears to be at significant risk for self-harm during episodes (Chamness, 2008, Rosen et al., 1996). Other medical sleep disorders include rhythmic movement disorders, nocturnal seizure disorders, nocturnal enuresis, and gastro-esophageal reflux disorder (Anders & Eiben, 1997).

Sleep disordered breathing (SDB) is another common problem in both childhood and adulthood. The symptoms can appear at any age and range from snoring to life-threatening apneas (Pelayo, 2006). Often this occurs in association with obstructive sleep apnea, a disruption of air flow preventing the body from receiving enough oxygen and causing the brain to reduce sleep depth and semi-awaken throughout the night (Pelayo, 2006; Thorpy & Yager, 2001). In any of the three types of identified sleep apneas (obstructive, central, and mixed) these "microarousals" to restore the ventilation and oxygenation of the blood may occur over 200 times per night. This causes a serious fragmentation of sleep and sleep deprivation (Anders & Eiben, 1997). In some cases other types of irregular breathing, snoring, and mouth breathing during sleep can cause

problems. Guilleminault, Eldridge, Simmons, and Dement (1976) described the first report of obstructive sleep apnea in children and concluded that excessive daytime sleepiness, decreases in school performance, abnormal daytime behavior, enuresis, headache, abnormal weight, and development of hypertension were all suggestive of a sleep apnea syndrome. Since then, testing of irregular breathers has indicated that even though still within the normal range, overall cognitive abilities, some language functions, and some visual-spatial functions are significantly lower in children that snore compared to controls (Pelayo, 2006). In obstructive sleep apnea patients, sleepiness-sensitive tasks such as attention, tracking, memory and learning are primary areas of deficit (Jones & Harrison, 2001). Often sleep disordered breathing has a surgical solution that is beneficial in reducing the problem (Anders & Eiben, 1997; Chamness, 2008; Pelayo, 2006).

Owens et al. (1998) discovered an interesting compensation effect in children with obstructive sleep apnea syndrome (OSAS). The authors write that the average sleep duration of children diagnosed with a behavioral sleep disorder (BSD) was significantly shorter than the sleep duration for children in the OSAS group, suggesting the presence of a compensatory mechanism in the OSAS group. They note that both groups suffered from an increased frequency of bedtime struggles that would presumably reduce sleep duration in both groups. However, the OSAS group slept on average 2.1 hours longer per night than the BSD group. The authors speculate that is may be this compensatory mechanism develops in response to the sleep fragmentation in OSAS, essentially by increasing the overall sleep duration to mitigate the microarousals that occur during OSAS, and may also play a role in the mitigation of the daytime neurobehavioral consequences of OSAS (Owens et al., 1998).

Risk of adult psychopathology. The American Psychiatric Association reports a strong association between sleep problems and depression in adults (American Psychiatric Association, 1994). Studies with adults who reported episodes of insomnia during consecutive interviews were more likely to develop episodes of major depression over the next year. If the subject was able to resolve the insomnia before the time of the second research interview, the risk for developing major depression decreased (Ford & Kamerow, 1989).

Significant research has been done with adolescent subjects, and it appears that sleep difficulties and internalizing problems (depression, anxiety) are associated. Gregory and O'Connor (2002) explored the link between insomnia and depression, and insomnia and anxiety in a longitudinal study. The authors reported that their findings support a link between persistent sleep problems in childhood and a diagnosable anxiety disorder in adulthood, and speculated that it is possible there are similar underlying risk factors to account for the link (Gregory & O'Connor, 2002).

Childhood psychopathology. Children suffering from fragmented, disturbed or restricted sleep often present with attentional difficulties and irritability, and less often with subjective feelings of tiredness (Pelayo, 2006). In extreme cases children may present with a syndrome similar to failure to thrive, which is likely related to insufficient release of growth hormones during sleep (Anders & Eiben, 1997). Sleep problems are also associated with affective disorders, anxiety disorders and symptoms consistent with PTSD in school-age children (Sadeh et al., 2002). Sleep problems and manifestations of poor impulse control, behavior problems, and psychopathology have been linked to children in clinical and non-clinical populations. Dahl (1996a) wrote that children and

adolescents with psychiatric, behavioral, or emotional problems had a significantly elevated rate of sleep related symptoms and problems; also, children with sleep problems showed a significant elevation in rates of psychiatric diagnoses and behavioral/emotional symptoms (Dahl, 1996a). Children that are diagnosed with PDD, autism or other autism-spectrum disorders tended to have a higher prevalence of disorganized sleep when compared to controls (Sadeh et al., 2002).

The qualities of sustained attention and behavioral inhibition are frequently used to understand developmental psychopathology, and are also affected by sleep fragmentation and deprivation (Sadeh et al., 2003). When adults are sleep deprived they often experience a subjective sense of sleepiness, but children and adolescents with excessive daytime sleepiness may present as being easily frustrated, agitated, irritable, aggressive, moody, emotionally labile, impulsive--all of which can lead to school and learning problems (Chamness, 2008; Fallone, Owens, & Deane, 2002). Collectively this pattern of symptoms is referred to as *eds*, or excessive disruptive symptoms. In assessing the *eds* of a particular child, the similarity between them and symptoms of attention deficit disorders should be noted (Chamness, 2008; Pelayo, 2006). The conclusion is for parents and professionals to be very well-educated on the consequences of poor quality or reduced duration of sleep in children, particularly when the child is being evaluated for some type of psychopathology (Pelayo, 2006). It can be beneficial to treat sleep disturbances at a younger age, because Gregory and O'Connor (2002) reported that sleep problems at age four years predicted behavioral/emotional problems during the middle adolescent years (Gregory & O'Connor, 2002).

O'Brien et al. (2003) report on sleep disordered breathing in children by interviewing parents of children with reported attention deficit symptoms. Utilizing the Conners' Parent Rating Scale Attention Deficit Hyperactivity Disorder (ADHD) index, these authors concluded that there existed a high prevalence of snoring among the children exhibiting mild symptoms of ADHD (O'Brien et al., 2003). The similarity between the daytime symptoms of children with sleep-disordered breathing and the symptoms of children with attention disorders has lead to research attempting to find a link between ADHD and sleep disturbance. However, most studies have failed to detect a clinically significant difference between children with ADHD and controls. Corkum, Tannock, and Moldofsky (1998) reported their only consistent finding was that the subjects in the ADHD group moved more at night in comparison to the non-ADHD group. They also reported that stimulant medication used to control the daytime behaviors of ADHD diagnosed children led to changes in the children's sleep, e.g. sleep latency was prolonged and there was an increased length of onset to first REM cycle (Corkum, Tannock, & Moldofsky, 1998).

As described earlier, children experience a biological push toward eveningness at the onset of puberty, which is consistent across cultures (Carskadon et al., 1993; Yang et al., 2005). Gau et al., (2007) reported in their study of 1332 students aged 12-13 years that eveningness might be an indicator of psychopathology. After correcting for confounding factors, children in the group with the strongest eveningness ratings experienced more anxiety and depression than students with weaker eveningness ratings, as well as experiencing other emotional-behavioral problems including inattention, aggressive and delinquent behaviors, thought problems and social problems. Even the

group with the strongest morningness ratings was at risk for depression although not for aggressive or delinquent behaviors. The authors also reported a link between eveningness and suicidality (Gau et al., 2007). Gangwisch, et al. (2010) also reported an association between short sleep duration and suicidal ideation (Gangwisch et al., 2010).

Depression and anxiety are the most common outcomes associated with sleep problems, but sleep problems are linked to a variety of psychiatric disorders (Gregory & O'Connor, 2002), and sleep problems and depression co-occur during adolescence (Dahl, 1996a). In older adolescents, data from survey research indicates that the late and long weekend recovery schedule employed by adolescents to compensate for daytime sleepiness is associated with poor academic performance, depressed mood, and an increase in risk-taking behaviors (O'Brien & Mindell, 2005; Wolfson & Carskadon, 1998).

In regard to personality characteristics such as introversion or extroversion and level of ambition, studies have shown inconsistent findings (Gau, 2000). Two studies on the relationship between sleep and personality in a clinical adolescent population have concluded that poor sleepers present with more neurotic traits and good sleepers present with more sociopathic and externalized traits (Bertelson & Monroe, 1979). In nonclinical samples, Gau (2000) reported that high ratings on neuroticism corresponded with feelings of sleep insufficiency, tiredness, moodiness, and difficulty waking up in the morning. The high neuroticism group had a higher risk of early and middle insomnia, nightmares, sleep talking, and a stronger eveningness preference. The high neuroticism subjects were more likely to fall asleep during class, doing homework, taking an exam and studying than those in the low neuroticism group. In addition, the teachers of the students in the high

neuroticism group rated them as performing less well academically than their actual ability would indicate (Gau, 2000). Dagan, Stein, Steinbock, Yovel, and Hallis (1998) report similar results. Using a clinical population, the authors described an interrelationship between personality disorders characterized by emotional lability and delayed sleep phase syndrome (Dagan et al., 1998). Giannotti et al., (2002) reported higher rates of emotionality among evening types, which was related to a greater incidence of emotional problems (Giannotti et al., 2002).

Neurobehavioral functioning (NBF). There is ample evidence that inadequate sleep quantity and quality are linked to significant problems in several domains of adolescents' lives (Carskadon et al., 1998; Gibson, et al., 2006; Lebourgeois et al., 2005; Wolfson & Carskadon, 1998). According to Jones and Harrison (2001) the distinction between the different brain functions that appears to be affected by sleep loss remains without a "unifying explanation at the level of cognitive mechanisms" (Jones & Harrison, 2001, p.465). The authors argued that poorly defined concepts of attention, executive function, and memory are being measured using task challenges that are designed for more severe levels of impairment and as such this process inhibits the research in this area (Jones & Harrison, 2001). Even with overlap between studies attempting to measure psychopathology as it relates to sleep deprivation or fragmentation and studies attempting to measure deficits in neurobehavioral functioning as a result of inadequate sleep, the clinical and observational data tend toward a picture of inadequate sleep quality and/or quantity being linked to tiredness/daytime sleepiness, difficulty with focused attention, irritability, ease of frustration, and impulse control problems (Dahl, 1996b).

One of the most salient aspects of sleep disturbance in children and adolescence is the potential impact on the primary activity of this population: school. Sleepiness may be a widespread problem in the school setting, where reduced sleep quantity and poor sleep quality are associated with reduced academic performance, including problems with attention and an increased number of absences (Crowley & Carskadon, 2010). In older adolescents, data from survey research indicates that the late and long weekend recovery schedule employed by adolescents to compensate for daytime sleepiness is associated with poor academic performance, as well as depressed mood and other behavioral problems (O'Brien & Mindell, 2005; Wolfson & Carskadon, 1998). In 2002, Eliasson, Eliasson, King, Gould, & Eliasson (2002) reported a complete lack of association between sleep duration and quality and academic performance. However, the only questionnaire that was used to ascertain sleep data from students was developed by the research team and evaluated on its ease of use but not reliability or validity (Eliasson, Eliasson, King, Gould, & Eliasson 2002).

Gibson et al. (2006) report 70% of Canadian high school students surveyed described bedtime habits (consistent routine, staying up late) that were significantly associated with high scores on the Epworth Sleepiness Scale (ESS). The students who scored highest on the ESS were more likely to feel their grades had dropped because of sleepiness and were the students most likely to be late for school and feel extremely sleepy in the early school hours (Gibson et al., 2006). One possible explanation for this is that students who got more sleep were able to obtain better grades because of their ability to be more alert during class time, and to be able to pay greater attention during class and while completing homework (Wolfson & Carskadon, 1998).

Randazzo, Muehlback, Schweitzer, and Walsh (1998) report that students aged 10 to 14 years were significantly impaired on the WCST and portions of the Torrance Test of Creative Thinking after being placed on a one night's sleep episode restricted to five hours. These tests were used to measure impairment in higher cognitive functions such as verbal creativity and abstract thinking. Overall or routine levels of performance were the same when compared to the group assigned an 11-hour overnight sleep episode. The authors concluded that abstract thinking and verbal creativity--the higher cognitive functions--were more sensitive to sleep restriction in children (Randazzo et al., 1998). Other researchers utilizing experimental conditions where children were subject to reduced overall sleep duration or significantly fragmented sleep have suggested that there may be a compensatory mechanism at work. Carskadon et al., (1998) report that sleep restriction may not lead to the same degree of dysfunction in NBF that total sleep deprivation does. Consistent with the Carskadon et al. study, Sadeh et al. (2002 & 2003) suggested the adverse effects in NBF from sleep fragmentation stem from the increase in less-restorative sleep and the relative decrease in deeper and more restorative stages of sleep (Carskadon et. al., 1998; Sadeh et al., 2002 & 2003).

Eager to determine if the deficits in neurobehavioral functioning measured in previous studies had significant effects on academic performance in the classroom, Fallone, Acebo, Seifer, and Carskadon (2005) placed school-age students on a one-week sleep restriction (to as little as six and a half hours per night) and then measured the effects *in vivo* through teacher ratings. They reported that children in the sleep-restricted condition were slower to process new information, were more forgetful, were more likely

to be rated by the teacher as experiencing academic difficulty in the classroom, and presented with a hypo-active demeanor (Fallone et al., 2005).

Treatment: Sleep hygiene. The only activities that should be undertaken the last two hours before bedtime are those that prepare the brain and body for sleep. In some cases this may be idiosyncratic to the particular child. For example, many children and adolescents have a bedtime routine that includes bathing or showering. However, some young children find a bath and associated play in the tub exciting or stimulating. For these children, it would be best to bathe earlier in the evening or in the morning (Chamness, 2008). Galbraith, Hewitt, and Pritchard (1993) reported increasing the parental attention to sleep induction rather than intervening at the points of night-waking created a 73% satisfaction rate from parents (indicating significant improvement with the targeted behaviors), and with a 62% satisfaction rate at follow-up (Galbraith et al., 1993).

In a comparison between Italian and American adolescents, Lebourgeois et al. (2005) reported, "cross-cultural differences in sleep quality...were due to differences in sleep hygiene practices. Sleep hygiene is an important predictor of sleep quality in Italian and American adolescents, thus supporting the implementation and evaluation of educational programs on good sleep-hygiene practices" (Lebourgeois et al., 2005, p.263). Parents and professionals should also be aware of the potential benefits of even a modest extension in sleep duration, which can be easily achieved by increasing the parental monitoring of bedtime and (for younger children) simply going to bed earlier (Sadeh et al., 2003). Unfortunately, this type of knowledge is not always the case, even among pediatricians (Gibson et al., 2006). It can be beneficial to treat sleep disturbances at a younger age, because Gregory and O'Connor (2002) reported that sleep problems at age

four years predicted behavioral/emotional problems during the middle adolescent years. This result was achieved after accounting for the sex of the child, adoptive status, and the stability of the behavioral/emotional problems. The authors concluded there is an important developmental change that occurs in the overlap between sleep problems and behavioral/emotional problems that may exacerbate symptoms of both (Gregory & O'Connor, 2002).

Other interventions. Even with sleep difficulties possibly affecting over half of all children in the U.S., the International Pediatric Sleep Education Task Force concluded in 2003 that there are significant gaps in knowledge for what parents and pediatricians believe is healthy sleep for kids and adolescents (Thompson & Christiakis, 2005). Therefore, it seems that significant education about sleep hygiene, appropriate sleep quantity, and how to achieve high quality sleep is needed. Education regarding a wide variety of sleep related issues is an important intervention described by many leading authors of research on sleep with children and adolescents (Carskadon, 1998; Crowley & Carskadon, 2010; Hagenauer et al., 2009; Sadeh et al., 2003). Other commonly suggested interventions are reducing computer, TV and video game playing activity before bed, and increasing morning activity outdoors (Hagenauer et al., 2009). However, research is still ongoing into how well these interventions work in practice.

For example, the National Sleep Foundation (2000) recommends that adolescents avoid the extremes of the late and long weekend recovery schedule as much as possible. The Foundation suggests delaying bedtimes on weekends by no more than one hour, and suggests to adolescents that they wake-up on weekends within two hours of their normal weekday rise time. To cope with daytime sleepiness, the Foundation also suggests an

early afternoon nap. However, Crowley and Carskadon (2010) in testing similar interventions, determined that in healthy adolescents this intervention did not keep the circadian system balanced between weekday and weekend. The authors suggested alternative approaches need to be tested (Crowley & Carskadon, 2010).

Interventions for sleep problems have taken the form of support groups for parents and caregivers, visits to a clinic to see an individual therapist (Minde et al., 1993), individual therapists visiting the home (Galbraith et al., 1993), and written information (Seymour et al., 1989). Self-help guides, written to assist parents with a wide range of common problems other than sleep, have been proven to be effective (McMahon & Forehand, 1981). Specific to interventions for sleep disturbance in children, studies have demonstrated that groups receiving written information improved significantly more over wait-list groups in regard to the number of night wakings the child experienced as well as in time taken to settle and fall asleep (Seymour et al., 1989). Eckerberg (2002) hypothesized that written information given to parents of children with sleep disturbances would be more beneficial when combined with what he termed "emotional support," which was a phone call with the author. However, Eckerberg reported that in most cases the written information was enough (2002).

The Strategic Use of Messages

The framing of messages as a concept in psychological science can be traced to the early 1980s, when Tverksy and Kahneman published research on what they called the framing effect. They reported that even when all the outcomes of a set of messages were objectively equal, individuals would change their response based on the framing of a particular message or problem. According to the authors, even when the outcome of two

separate messages was mathematically the same, there was a differential response based on the framing of the message (Tversky & Kahneman, 1979). When a message is attempting to persuade an individual to perform a behavior that involves some personal risk, information presented in a negative frame should be more effective than the same information presented in a positive frame. This framing postulate stems from Prospect Theory, also developed by Tversky and Kahneman. Prospect Theory states that individuals avoid risks when they are considering a situation that involves a relative gain and prefer risks when considering possible losses. Therefore, an individual's preference for an option seen as risky depends on whether or not the message is framed in terms of the possible gains or the possible losses (Tverksy & Kahneman, 1981; Rothman, Salovey, Antone, Keough, & Martin, 1993).

Messages in Healthcare

Message framing research has always had a close relationship with the healthcare field because of the need for prompting large groups of people to engage in healthy behaviors such as smoking cessation or weight loss and exercise. Brief, self-help types of interventions such as brochures or pamphlets have the potential to reach a larger proportion of a targeted group of individuals, and therefore have become the focus of much of the message framing research (McCaul, Johnson, & Rothman, 2002). In addition, the nature of early detection of disease being so vital to the availability of treatment options that can reduce the risk of more serious illness or death has lead many researchers to pursue message framing research in a health education context (Smith, Cokkinides, & Eyre, 2007). Also, providing information to patients as part of informed choice or informed consent for certain surgical procedures or other medical interventions

has also received attention in the message framing literature (Garcia-Retamero & Galesic, 2010).

However, as early as 1993, researchers were discovering that message framing did not always result in a consistent effect on the behavior of individuals, even in a specifically health-related context (Rothman et al., 1993). This was determined to be partially due to differences in the operational definitions of message framing (i.e., the difference between both frames emphasizing different or the same consequences, a message frame depicting the same consequences in terms of either performing or not performing a certain behavior, or a message frame emphasizing a quality of the choices available). These different types of framing were found to have different underlying processes that affect an individual's response to information (Levin, Schneider, & Gaeth, 1998). These types of framing, referred to as risky choice, goal framing, and attribute framing have come to form a typology underlying message framing research that has been useful in clarifying some of the contradictory results from the early years of framing research (Levin et al., 1998; Mahoney et al., 2011). Much of the body of research on persuasion that is pertinent to the current study focuses on goal framing. Goal framing is based on the question of whether or not the decision maker perceives the potential benefits of engaging in the behavior that is presented in the message (gain frame), or perceives the possible costs of not engaging in the behavior that is presented in the message (loss frame) (Bartels, Kelley, & Rothman, 2010).

Prevention and detection. Another factor determined to make a difference in effectiveness of message framing was the particular behavior being advocated in the message. After controlling for the same type of message framing described above,

Rothman et al. (1993) reviewed studies that still reported inconsistent framing effects among research utilizing the same consequences format. They argued that it is the target behavior being promoted in the message that interacts with the message frame and creates a moderating effect (Rothman et al., 1993). The two types of behaviors considered by Rothman et al. were referred to as prevention and detection behaviors. Those behaviors related to one's personal health that seek to maintain a current good health status or minimize the risk of developing a health problem are called prevention behaviors. In contrast, those behaviors that involve discovering a previously unknown health problem are called detection behaviors (Bartels et al., 2010). Prevention behaviors are usually considered to be risk avoidant, insofar as they ensure that one will not become ill in the future if one engages in the behavior. Detection behaviors are considered risk attractive because they involve the risk of discovering (and subsequently requiring the treatment of) a previously unknown health problem (Bartels et al., 2010; Rothman & Salovey, 1997). Because there appeared to be risk involved in the detection of a previously unknown health problem, consistent with the message-framing postulate of Prospect Theory, loss-framed messages were considered more effective for detection behaviors in the early stages of message framing research (Bartels et al., 2010; Rothman, Bartels, Wlaschin, & Salovey, 2006; Rothman et al., 1993).

The prevention/detection paradigm stems from research by Meyerowitz and Chaiken (1987) on the framing effects regarding messages about breast self-examination for the detection of breast cancer. In this study, the authors started with the American Cancer Society recommendation that beginning in their 20s women should be told about the benefits and limitations of breast self-exam (BSE), and women should know how

their breasts normally look and feel so that any changes can be reported to a health professional immediately (America Cancer Society, 2011). Meyerowitz and Chaiken presented groups of female college-aged subjects with a loss-frame pamphlet, a gain-frame pamphlet, a no-arguments pamphlet, or no pamphlet at all to test which frame would be more persuasive. The pamphlets described both the importance of completing BSE as well as proper techniques for completing the self-exam. The authors' hypothesis, that the pamphlet stressing the negative consequences of not performing BSE would be more persuasive, was supported both immediately after the intervention and at re-test four months later. The subjects who received the loss-frame message had more positive attitudes, intentions and behaviors than the other three conditions. The loss-frame subjects also reported the greatest levels of self-confidence on measures of perceived self-efficacy (Meyerowitz & Chaiken, 1987). However, in a follow-up study, it was only for those women in the loss-framed condition who considered BSE to be a risky behavior that the loss frame was more effective. For women who did not perceive BSE to be risky, the gain-frame was slightly more effective (Bartels et al., 2010; Meyerowitz, Wilson, & Chaiken, 1991).

As inconsistent or conflicting accounts persisted in message framing research, several meta-analyses have been published seeking to clarify expected effect sizes. O'Keefe and Jensen reported in 2006 that when the primary outcome variable was persuasion, including the intention to change, attitude, and actual demonstrated behaviors, loss frame appeals were not any more persuasive than gain fame appeals. When the prevention or detection type of message was included in their analysis, they found gain frame appeals to be more persuasive when the goal was increasing prevention

behaviors (O'Keefe & Jensen, 2006). In their second meta-analysis published in 2009, the authors examined whether the relative persuasiveness of gain- and loss-framed appeals varied depending on the particular detection behavior being advocated. They found that it was only for breast cancer detection behaviors that loss-framed appeals were more effective and not any other type of detection behavior e.g., skin cancer detection, dental problem detection, etc. (O'Keefe & Jensen, 2009).

Individual Differences

As a parallel path to determining the underlying causes of the inconsistency in message framing studies, some researchers have explored the nature of the individual characteristics of the decision makers themselves, rather than the particular qualities of the message (for review see Mahoney et al., 2010; O'Keefe & Jensen, 2009). In fact some researchers argue that the individual characteristics of the decision makers being targeted are the most important factors to consider when developing framed appeals (Bartels et al., 2010; Petty & Cacioppo, 1990). Mann, Sherman, and Updegraff (2004) wrote that the message framing phenomena is essentially an interaction effect based on two major components: the type of message and the characteristics of an individual message recipient. (Mann et al., 2004). These individual characteristics illustrate important differences in the susceptibility of an individual to any given message frame (Mann et al., 2004; Sherman, Updegraff, & Mann, 2008). For example, those individuals with lower levels of academic attainment demonstrated a stronger response to framing than do highly educated individuals (Armstrong, Schwartz, Fitzgerald, Putt, & Ubel, 2002). Factors such as affect and mood, ambivalence, personality, self-regulatory focus, temporal distance, culture, gender, regulatory fit, self-efficacy, self-esteem, and personal

involvement are all recently represented in the literature (Garcia-Retamero & Galesic, 2010; Mahoney et al., 2011). Several of these studies will be reviewed here to illustrate the breadth of current research in message framing.

The relationship between affect and message framing was investigated by Keller, Lipkus, and Rimer (2003). When subjects were induced into a positive mood, they were more persuaded by a loss-framed message, whereas the opposite was true for those subjects induced into a negative mood. The result remained consistent when the mood of the participant was measured before processing a message frame rather than being induced by the researchers (Keller et al., 2003). In contrast to studying the effects of mood induction, Van'Triet, Ruiter, Werrij, Candel and de Vries (2010) investigated affect as a product of the message itself. It is this message induced affect that the authors determined leads to greater levels of acceptance of information depending on the message frame. The authors report that gain-framed messages evoked greater levels of positive affect in test subjects, and as a consequence these subjects accepted information at greater levels. This positive affect as induced by gain-framed information was also found to result in more positive attitudes than the loss-framed condition (Van'Triet et al., 2010.)

One of the more complex individual factors in the persuasion literature is the concept of personal relevance, also referred to as personal or issue involvement. Personal relevance refers to the extent to which the attitudinal issue under consideration is of personal importance to the individual decision maker (i.e., whether or not the message matters to the person making the decision). This is important to research in persuasion because decision makers respond to message frames based on how involved they are in the material being presented and this level of involvement is linked to the depth or level

of cognitive processing that takes place. Additionally, when a persuasive message is processed easily, it is more likely to be judged as true separately from the quality of the information given (Uskul & Oyserman, 2010).

Decision-Making and Cognitive Processing

Several groups of researchers are exploring different models of decision-making as it relates to message framing and personal involvement. For example, Maheswaran and Myers-Levy (1990) hypothesized that for an individual decision maker, finding the message to be personally highly involving would lead to the loss frame being more persuasive because the more involved the decision maker is with the issue in the message, the deeper or more detailed the cognitive processing is. This deep level of processing (also referred to as systematic processing) leads to an emphasis on the negative information and causes the loss frame to be prominent in the mind of the decision maker, and is therefore more persuasive. In contrast, when the messages were framed positively and issue involvement was low, decision makers did not process the material deeply but simply relied on inferences to determine their attitude. This is also referred to as heuristic processing. The inferences were elicited from the positive framing of the message, and because when decision makers infer their attitude from a message they have a tendency to agree with positive messages more, this positive frame condition was more persuasive for this group (Maheswaran & Myers-Levy, 1990). Follow-up research suggested that this model, and its third component, a hybrid type of processing that mixes both heuristic and systematic processing, have accounted for some of the mixed results in message framing research (Meyers-Levy & Maheswaran, 2004).

Other models of information processing reached similar conclusions. Petty and Cacioppo (1979) reported that the mode of information processing, either central or peripheral, affected responses to messages. When a central processing route was used, negative information was weighed more heavily; therefore, for individuals who are highly involved with an issue negatively framed messages were more persuasive (Petty & Cacioppo, 1990). Petty and Cacioppo developed this concept into the Elaboration Likelihood Model (ELM) of persuasion. Designing a message to fit a particular individual characteristic (such as the personal relevance one feels for the topic in the message) made the message more effective because the recipient was more like to carefully attend to and consider the message that holds significant personal relevance (Petty & Cacioppo, 1990; Updegraff et al., 2007).

Other researchers have focused on a linear process of decision-making and how each stage has its own qualities that can affect the cognitive processing of a message frame. Mann, et al. (2004) argued that to get from communicating health messages to a measurable behavioral change, a three-step process occurs. First, there is the act of perceiving and remembering the message, then forming an intention to make a behavioral change, then finally selecting a strategy to implement the goal or intention (Mann et al. 2004; O'Keefe & Jensen, 2009). In their study of approach and avoidance motivations, Mann et al. (2004) reported on their test of the congruency hypothesis: avoidance-oriented people responded more to a loss-framed message, and approach-oriented people responded more to a gain-framed message. They believed that the approach/avoidance motivation of an individual influenced each of these steps in behavior change (Mann et al., 2004).

The process of behavior change in the Mann et al. study is similar in focus to the Theory of Planned Behavior by Ajzen (Ajzen et al., 2009). The authors argued that large proportions of variance in behavior could be explained by an individual's behavioral intentions. These behavioral intentions are a sense of commitment on behalf of the decision maker to produce the response (i.e., a specific plan about when, where and how the intended action will be carried out). Possessing an implementation intention regarding a particular behavior activates the mental representation of a specified situation and makes it chronically accessible, much like a habit in its automaticity. When a research subject possessed this implementation intention, the correspondence increased dramatically between intended and actual behavior (Ajzen et al., 2009).

According to Pelletier and Sharp (2008), the process of behavior change is one of detection, decision, and implementation. Detection refers to an individual's sensitivity to a message that will help the person gather information and determine if a problem is present. The decision stage occurs after a problem has been detected and the problem is seen as important, and reflects a sensitivity to messages that help an individual decide to take action and decide what action to take. The implementation stage occurs after a decision to act has been made, and is characterized by sensitivity to messages that provide information about how to implement, maintain, or integrate a behavior into one's lifestyle. In regard to message framing, the authors argued that messages should be targeted toward an individual's specific concerns, but also communicated in such a way to maximize the influence on the thoughts of the specific phase of the decision maker (Pelletier & Sharp, 2008). This is consistent with the work of Rothman and Salovey (2007) who wrote that a persuasive message, to have optimal effectiveness, should be

guided by the process by which people change their behavior (Rothman & Salovey, 2007).

Pelletier and Sharp (2008) explained that framing a message to address the potential costs or benefits of a behavior in the detection phase will lead to the loss frame garnering more attention and having a larger impact because the costs of failing to adopt a particular behavior are most consistent with the purpose that defines the detection phase: determining if an issue is problematic. For an individual in the decision phase, messages that help people make decisions and achieve the goal of risk reduction are most effective. These messages, being gain-framed, were more congruent with the action that could potentially eliminate the fear or sense of risk involved with a specific issue. Once a decision maker is in the implementation stage, the primary challenge is continuing the individual's initial efforts and sustaining the behavior after experiencing the new behavior. The authors suggested that extrinsic motivation is adequate early on in this process, but that to maintain behavior change an intrinsic motivation is more effective (Pelletier & Sharp, 2008).

Self and self-other. The differences between intrinsic and extrinsic motivation were targets of research by Loroz (2007) in her investigation of message frame and point of reference in prosocial appeals such as recycling behaviors or other pro-environmental behaviors. Loroz (2007) argued that the reference point, either self (this is how your behavior may affect you) or self-other (this is how your behavior may affect others) is a process of personal involvement with a message and resource activation for processing the message, which therefore moderated the effectiveness of a message frame. In regard to self-referencing behaviors, the volume of cognitive associations that one has to their

self-enhanced involvement in the persuasion attempt and increased the cognitive resources available for the processing of the message. In contrast, mental representations of others are less rich, less distinctive and less accessible, and therefore less involving. This activated fewer cognitive resources for processing the intended message. Therefore, a self-referencing message was most effective when paired with a cognitively demanding message (i.e., those presented in a negative frame). If a negative frame was paired with a self-other message, cognitive resources were overwhelmed and persuasion was undermined (Loroz, 2007).

The self-other concept in persuasive message research is also important to issues of charity advertising and public service announcements (Chang & Lee, 2009; Jung & Villegas, 2011). In their study of message framing in the promotion of a charitable donation, Chang and Lee (2009) reviewed other research that cited both negative framing and positive framing as effective for enhancing the evaluation of a charitable issue relative to information presented neutrally. Similar to research described above, negatively framed messages were thought to arouse the decision-makers self-relevance and sympathy regarding the negative consequences if action is not taken. In essence, donors gave to avoid negative beneficiary outcomes. This result was supported in their research. Jung and Villegas (2011) wrote that anti-smoking public service announcements typically emphasized the negative consequences of failing to quit smoking, a negative frame. Their data supported the aforementioned processing arguments developed by Petty and Cacioppo (1979) insofar as their subjects highly involved in smoking behaviors processed information centrally, and those subjects less involved utilized a more peripheral processing approach. As their data indicated, positive

messages produced more favorable attitudes toward the anti-smoking advertisement under low-addiction conditions, and negative messages produced more favorable attitudes toward the advertisement under high-addiction conditions (Jung & Villegas, 2011; Petty & Cacioppo, 1979).

Self-referencing may also interfere with persuasion when there is too much focus on the self. Debevec and Romeo (1992) reiterated a truism of cognitive psychology in their study of self-referencing and perception of information in advertising. They wrote that individuals who self-reference new information were better able to learn and recall information because the self-referencing incoming information was associated with previously stored information and therefore provided that new information with meaning. The authors argued that a simple message manipulation, such as "I" versus "you" statements in persuasive messages, were powerfully evocative of the elaborate network of self-associations in memory and therefore cause a differential response to similarly worded messages (Debevec & Romeo, 1992). Advertising and marketing professionals have used message framing to understand how a particular message can influence perceptions of a product's quality, reputation, and attractiveness. Political strategists have used message framing to understand how to gather support for a particular candidate or voter initiative. However, the relative effectiveness of gain frames versus loss frames is still inconsistent in the current literature with some studies suggesting gain frames are more effective, but other studies have found loss frames more effective (Mahoney et al., 2011).

At this time, the research on message framing is incredibly dynamic with many models and theories being tested and the literature constantly expanding. The interaction

of various fields of study with myriad individual characteristics and theories of decision making create a complex body of work that not only spans several decades but is constantly changing terminology and incorporating terms from a broad range of research modalities. Relevant to the current research project is the conceptualization that prevention behaviors are influenced to a greater degree by positively famed messages focusing on gains, and that detection behaviors show increased response when treated to a negative or loss frame, combined with the idea that personally relevant information is required to get the needed level of attention to the problem described in the message. The method described herein does not duplicate any previous research known at this time, but seeks to incorporate several of the most salient design components reflected in the literature to provide a unique but theoretically supported addition to the field, while providing for interesting possibilities in future research.

Hypotheses

Hypothesis One

a) On the Total Scale measure of the Parenting Scale, females will score higher than males.

b) On the Laxness subscale of the Parenting Scale, females will score higher than males.

c) On the Overreactive subscale of the Parenting Scale, females will score higher than males.

Justification for hypothesis one. The most common problem that parents of young children have is the management of bedtime behaviors and other issues related to sleep, such as night waking (Seymour et al., 1989). In general, this is more of a challenge

for mothers than fathers as it is typically the mother who is responsible for most of the direct child rearing (Yeung, Sandberg, Davis-Kean, and Hoferth, 2001). Because mothers accept a higher proportion of parenting responsibilities, their patience is more often compromised, leading to a more emotional style of discipline (Bronstein, 1984). This is true in regard to the reported personal experience of mothers as well as in previous research using the Parenting Scale (Bronstein, 1984; Harvey & O'Leary, 1997; Rhoades & O'Leary, 2007).

Hypothesis Two

a) For respondents who score in the high range on the Overreactive subscale of the Parenting Scale, those exposed to a gain-framed message will report a greater likelihood to implement recommendations when compared to a loss-framed message.

b) For respondents who score in the low range on the Overreactive subscale of the Parenting Scale, those exposed to a loss-framed message will report a greater likelihood to implement recommendations when compared to a gain-framed message.

Hypothesis Three

a) For respondents who score in high range on the Overreactive subscale of the Parenting Scale, those exposed to a gain-framed message will report finding the factsheet more persuasive when compared to a loss-framed message.

b) For respondents who score in the low range on the Overreactive subscale of the Parenting Scale, those exposed to a loss-framed message will report finding the factsheet more persuasive when compared to a gain-framed message.

Hypothesis Four

a) For respondents who score in the high range on the Laxness subscale of the Parenting Scale, those exposed to a gain-framed message will report a greater likelihood to implement recommendations when compared to a loss-framed message.

b) For respondents who score in the low range on the Laxness subscale of the Parenting Scale, those exposed to a loss-framed message will report a greater likelihood to implement recommendations when compared to a gain-framed message.

Hypothesis Five

a) For respondents who score in the high range on the Laxness subscale of the Parenting Scale, those exposed to a gain-framed message will report finding the factsheet more persuasive when compared to a loss-framed message.

b) For respondents who score in the low range on the Laxness subscale of the Parenting Scale, those exposed to a loss-framed message will report finding the factsheet more persuasive when compared to a gain-framed message.

Justification for hypotheses two through five. It is generally understood that gain-framed messages more effectively promote *preventive* health behaviors (i.e., those behaviors that maintain health or minimize the risk of a health problem) (Bartels et al., 2010). Health prevention behaviors are usually considered to be risk avoidant, insofar as these behaviors ensure that one will not become ill in the future (Rothman, et al., 2006). For the purposes of this study, subjects who indicated the frequent use of dysfunctional discipline were construed to be risk avoidant, as it is the parents who express varying degrees of Laxness (eventually giving in to their children after a short period of misbehavior), Overreactivity (openly expressing frustration and threats of physical

punishment), or Hostility (hitting, cursing, insulting or name calling) who are both avoiding the exercise of control and seeking to avoid conflict with the child in the short-term (Arnold et al., 1993; Baumrind, 1966; Rhoades & O'Leary, 2007).

Loss-framed messages are generally more effective at promoting health *detection* behaviors (i.e., those behaviors that involve the risk of discovering a problem that was previously unknown) (Bartels et al., 2010). These types of health detection behaviors are usually considered to be risk attractive in the sense that one might discover a problem of which he or she was previously unaware (Rothman, et al., 2006). For the purposes of this study, subjects who indicated the infrequent use of dysfunctional discipline were construed to be risk attracted. These are the parents or caregivers who provide clear, firm, consistent and appropriate consequences in the face of noncompliant and aggressive behaviors of their children and put aside their own self-interest to promote the best long-term interests of the child (Arnold et al., 1993; Baumrind, 1966; Rhoades & O'Leary, 2007).

Hypothesis Six

a) Those respondents who are exposed to a gain-framed message will have a lower incidence of email address disclosure than those exposed to a loss frame.

b) Those respondents who are exposed to a gain-framed message will have a lower interest in attending an educational seminar than those exposed to a loss frame.

Hypothesis Seven

a) Those respondents who are exposed to a loss-framed message will have a higher incidence of email address disclosure than those exposed to a gain frame.

b) Those respondents who are exposed to a loss-framed message will have a greater interest in attending an educational seminar than those exposed to a gain frame.

Justification for hypotheses six and seven. Individuals who seek to reduce their risk in a health-behavior context are more likely to be influenced by a message written with a loss frame due to their risk attraction. Detective health behaviors (i.e., those who involve discovering a problem previously unknown), are considered to be risk attracted (Bartels et al., 2010; Rothman, et al., 2006). Therefore, individuals who select detective behaviors, such as seeking out additional information and actively pursuing interventions to resist the onset of future problems, were thus expected to be more likely influenced by a loss-framed message.

Hypothesis Eight

a) Those respondents who disclose their email address will have lower scores on the Total Scale measure of the Parenting Scale.

b) Those respondents who disclose their email address will have lower scores on the Laxness subscale of the Parenting Scale.

c) Those respondents who disclose their email address will have lower scores on the Overreactive scale of the Parenting Scale.

Hypothesis Nine

a) Those respondents who wish to attend the educational seminar will have lower scores on the Total Scale measure of the Parenting Scale.

b) Those respondents who wish to attend the educational seminar will have lower scores on the Laxness subscale of the Parenting Scale.

c) Those respondents who wish to attend the educational seminar will have lower scores on the Overreactive subscale of the Parenting Scale.

Justification for hypotheses eight and nine. Subjects indicate the infrequent use of dysfunctional discipline as indicated by lower scores on all scales of the Parenting Scale are attracted to risk because in the face of the noncompliant and aggressive behaviors of their children these parents or caregivers provide clear, firm, consistent and appropriate consequences. (Arnold et al., 1993; Baumrind, 1966; Rhoades & O'Leary, 2007). Being attracted to risk in the sense of confronting a problem indicates a detection-type behavior (Rothman et al., 2006), which in this context includes seeking out additional information and actively pursuing intervention to resist the onset of future problems (i.e., disclosing an email address and wanting to attend an educational seminar).

CHAPTER TWO

METHODS

This section provides a summary of the methodology utilized for this study. It includes the following sections: Pilot Study, Participants, Instrumentation, Procedure, and Data Analysis.

Pilot Study

Before the initiation of the final research project, a pilot study was conducted as a preliminary feasibility test of scale development for the researcher-derived Factsheet Attitude Questionnaire to be used as outcome data in the final study. After securing approval from the Institutional Review Board Human Use Committee (see Appendix A), 43 volunteer participants who were parents of school-age children were recruited from the local community. This convenience sample was drawn from the same city in which the final research project was conducted. Subjects were first asked to read and sign consent forms, then to read a factsheet on sleep in children. After reading the factsheet, participants were asked to complete the Factsheet Attitude Questionnaire regarding their feelings about the factsheet in regard to its persuasiveness and behavioral change or intention. The same 12 items developed for the pilot study were used in the final research project.

Development of the Factsheet Attitude Questionnaire was patterned on the current literature and established methods of questioning subjects about their attitudes, feelings, and opinions regarding a reading sample, as well as respondents' intent to perform a particular behavior or action as described in the reading sample. These constructs are frequently assessed through self-report questions and simple behavioral observations, typically four items (Ajzen et al., 2009; Bartels et al. 2010; Detweiler, Bedell, Salovey, Pronin & Rothman, 1999; Maheswaran & Myers-Levy, 1990; Updegraaf, Sherman, Luyster, & Mann, 2007). Common constructs measured in recent research on respondents' attitude toward or opinion of a reading sample include persuasiveness, personal relevance, clarity, accuracy, importance, helpfulness, and usefulness (Abhyankar, O'Connor & Lawton, 2008; Detweiler et al., 1999; Jung & Villegas, 2011; Maheswaran & Myers-Levy, 1990; Sherman, Mann & Updegraaf, 2006; Uskul & Oyserman, 2010). In regard to the suggested or recommended intervention contained in a reading sample, frequently measured constructs include the likelihood, interest in, intent to, and need to complete the intervention by the respondent (Detweiler et al., 1999; Keller et al., 2003; Maheswaran & Myers-Levy, 1990; Myers-Levy & Peracchio, 1996). Questions on the Factsheet Attitude Questionnaire were adapted from these studies to specifically address sleep behaviors and intentions to change sleep behaviors mentioned in the Sleep Factsheet (see Appendix B).

Participants

The current study recruited volunteer participants from a laboratory school associated with and located on the campus of a mid-size southern university. The students at the school were not the subjects of this study but they were utilized to make contact

with their parents, the desired participants. Approximately 150 parents representing diverse ethnicities with equal numbers of males and females participating was the goal with 114 total respondents. The participants were adults (over 18 years of age) with at least one child in grades Kindergarten through 8th grade, corresponding to approximately ages 5 through 13 years. Research participants were intended to represent a variety of family constellations including married two-parent families, divorced single-parent families, etc.

The recognized ethical guidelines established by the American Psychological Association were adhered to when interacting with and selecting participants (APA 2002). This study collected data utilizing the institutional research guidelines as approved by the University Human Use Committee from the university.

Anonymity was guaranteed to the participants throughout the survey process in order to maintain honesty in their responses. Because the students were not the actual subjects, there was no information in the survey packet that identified them in any way, and no information was released to the staff or faculty of the school. Participant response data from the questionnaires included the option to disclose a personal email address, which was kept confidential by being associated only with a confidential participant number. The identity of those who were interested in attending an informational seminar was also kept confidential by being associated with a confidential participant number. Informed consent was obtained prior to testing. The data obtained in this study was used in the aggregate only; no individual information was analyzed or reported.

Instrumentation

Demographic Questionnaire

The demographic questionnaire (see Appendix C) consisted of questions regarding age, sex/gender, racial/ethnic heritage, marital status, number and ages of children. Family lifestyle questions about shared family meals, numbers of televisions in the home, and extracurricular activities for children were also included.

Educational Factsheet

Following the format utilized by Rothman, Salovey, Antone, Keough, and Martin (1993), the positively framed and negatively framed information sheets were designed to differ only in how information was presented (see Appendix B). Each handout was one-page long and contained information concerning the general science of sleep, the prevalence of sleep disturbances in children, the recommended sleep requirements for children, factors that affect sleep quantity and quality, and recommendations for ways to improve sleep quality and quantity in children (Rothman et al., 1993).

The positively framed handout described statistics, facts, and arguments by emphasizing benefits rather than risks, and focused on the positive aspects of being concerned about sleep behavior in children. The negatively framed handout described the same information but emphasized losses rather than gains and focused on the risks of ignoring sleep quality and quantity in children (Mann et al., 2004; Updegraaf et al., 2007).

Factsheet Attitude Questionnaire

Participants completed a questionnaire regarding their evaluation of the factsheet in regard to the persuasiveness of the message and the degree of intention to implement

recommended behaviors (see Appendix B). Questions regarding persuasiveness and intention to implement were formulated by following the format commonly used in the literature for assessing attitude persuasion and intent to engage in a behavior (Abhyankar et al., 2008; Ajzen et al., 2009; Bartels et al., 2010; Detweiler et al., 1999; Jung & Villegas, 2011; Keller et al., 2003; Loroz, 2007; Maheswaran & Myers-Levy, 1990; Myers-Levy & Peracchio, 1996; Sherman et al., 2006; Updegraaf et al., 2007; Uskul & Oyserman, 2010).

The questionnaire was designed based on a combination of questioning methods reported in the literature. For example, Sherman et al. (2006) used questions that allowed participants to indicate their perceptions of the article on several dimensions including the accuracy, memorability, importance, helpfulness, and usefulness of the article (Sherman et al., 2006). Sherman et al. use a 7-point Likert-type scale. Other formats in the literature for assessing this construct include 9-point Likert-type scales (Uskul & Oyserman, 2010), and bi-polar adjective scales (Ajzen et al., 2009), among others. The current research uses a 5-point Likert-type scale ranging from 1 to 5. The number of items per similar questionnaire in the literature ranged from 2 to 6 questions (Abhyankar et al., 2008; Ajzen et al., 2009; Bartels et al., 2010; Detweiler et al., 1999; Jung & Villegas, 2011; Keller et al., 2003; Loroz, 2007; Maheswaran & Myers-Levy, 1990; Myers-Levy & Peracchio, 1996; Sherman et al., 2006; Updegraaf et al., 2007; Uskul & Oyserman, 2010).

For researcher-derived questions regarding the intention to change behavior, participants are typically asked to indicate to what degree they intend to implement the recommendations described on the factsheet based on a combination of questioning

methods reported in the literature. For example, Updegraaf et al. (2007) report using questions regarding intention to use dental floss with the phrases "intend to", "would try to", "planned on", and "planned on next week" (p. 255). This article did not report the number of points on the Likert-type scale used (Updegraaf et al, 2007). Other formats in the literature for assessing this type of construct include 9-point Likert-type scales (Uskul & Oyserman, 2010), and bi-polar adjective scales (Ajzen et al., 2009), among others.

The pilot study factor analysis results regarding the researcher-derived Factsheet Attitude Questionnaire did not support any factor structure to the items and therefore the individual items for persuasion and intention were not combined into attitude and intention index scores. Each item was included as an individual outcome variable for the purposes of data analyses, thus internal consistency analysis was not performed. Using single items as outcome measures is consistent with other studies in the message framing literature (e.g. Detweiler et al., 1999; Jeong et al., 2011; Uskul & Oyserman, 2010; Mann, Sherman, & Updegraff, 2004). All twelve questions developed for the pilot study were included in the Factsheet Attitude Questionnaire and in hypothesis testing (see Appendix B).

Following the format utilized in Detweiler et al. (1999), a more proximal measure of behavioral intention was used by providing participants with an information request form (see Appendix D). This form gave respondents the opportunity to disclose a personal email address to which they could request additional educational information be sent, and separately express a interest in attending an in-person psychoeducational seminar to learn more about sleep in children. Whether the form was completed or not constituted the behavioral measure (Detweiler et al., 1999). All information was kept

strictly confidential and respondents were assured that any personal information would be destroyed at the conclusion of the research project.

The Parenting Scale

The Parenting Scale (PS) (see Appendix E) provides a measure of dysfunctional discipline; it takes approximately 10 minutes to complete. Parents indicated how they typically respond to a variety of situations using a 7-point Likert-type scale over 30 items. It is designed to not be dependent on the frequency of the child's behavior but to allow parents to characterize their own behaviors regardless of the frequency of discipline encounters. The items on the PS are specific enough to target as intervention areas for parent training and the authors of the scale argue its usefulness as a research tool for examining the relationship of other variables to discipline practices (Arnold et al., 1993). The Parenting Scale is different from many paper-and-pencil assessment instruments in that it assesses the actual probability a parent uses a particular discipline technique or strategy rather than the attitude or opinion the parent holds about the technique (Rhoades & O'Leary, 2007).

In the original development of the Parenting Scale, the scale was divided into three factors, Laxness, Overreactivity, and Verbosity, as determined by a principal-components factor analysis with Varimax rotation. Laxness was an 11-item factor related to permissive discipline with items that describe ways in which parents give in, allow rules to go unenforced, or provide positive consequences for misbehavior. The Overreactivity factor consisted of 10 items reflecting discipline mistakes such as displays of anger, meanness, and irritability. The Verbosity factor consisted of seven items reflecting lengthy verbal responses and a reliance on talking even when it is ineffective.

The coefficients alpha for the factor and total scores was: Laxness, .83; Overreactivity, .82; Verbosity, .63; and Total, .84. There were four items that were not included in the factor scores but contributed to the Total Score, which was intended to be interpreted as a global index of dysfunctional parenting. Test-retest reliability using the Kolmogoroz-Smirnoff statistic were .83, .82, and .79 for the Laxness, Overreactivity, and Verbosity factors, respectively, and .84 for the Total Score. In an observational study, the total score was significantly correlated with observational ratings of parenting and scores from this measure have been shown to differentiate between clinic and nonclinic groups of children (Arnold et al., 1993).

Since the original date of publication of the Parenting Scale, five additional studies have been completed on a variety of population samples. Each study supported only a two-factor solution (of the Lax and Overreactive subscales). Though the Verbosity subscale characterized discipline situations for children less than three years of age, it was not replicated after the scale-development sample. After reviewing this data and completing a new factor-structure analysis, Rhoades and O'Leary (2007) recommend scoring the Parenting Scale according to the two-factor analysis completed by Reitman et al. (2001), with the option of including a new factor related to discipline that involves hitting, cursing, insulting or name-calling, the Hostile subscale (Rhoades & O'Leary, 2007). Reitman et al. (2001) report Cronbach's alpha for the original full scale and the Laxness and Overreactivity subscales at .71, .77, and .72, respectively. For the revised scales, which include only items loading with greater than 30% of the common variance with the factor, the full scale, Laxness and Overreactivity are .71, .70, and .74 respectively. Correlation between the original and modified scales was high at .87 for the

full scale, .91 for Laxness, and .89 for Overreactivity. One-month test-retest correlations were .73, .71, and .75 for Laxness, Overreactivity, and the full scale, respectively.

Reitman et al. (2001) also write that parents who report disciplinary errors were associated with less parental involvement, limit setting, satisfaction and support. This is similar to data from other researchers indicating that parents with poor discipline practices may exacerbate conflict between the parent and child (Irvine, Biglan, Smolkowski, & Ary, 1999). The PS total score was highly related to parenting stress and psychopathology, similar to the original data on scale development (Arnold et al., 1993).

For the purposes of this study, scores on the Total, Overreactive, and Lax were categorized into high or low groups based on the median observed score. Those scores above the median were defined as high and those scores at or below the median were defined as low.

Procedure

The research project began once the doctoral student dissertation committee, at a formal presentation, approved the dissertation proposal defense. Next, an application for approval from the university Institutional Review Board was sought for permission to conduct the research project. After securing permission from the Human Use Committee Review Board to complete the study, the researcher requested permission from the principal of the laboratory school to distribute survey packets to homeroom teachers, who then distributed packets to students to take home to their parents.

After the principal granted permission, homeroom teachers were asked to distribute packets of survey materials in closed envelopes to their homeroom students at the end of school day. It is a common practice for students to take home announcements,

flyers, reminders, and notes from school, so this process was not disruptive or confusing to the students in any way. The first pages of the packet were consent forms and information about the research study. If the parent (or other adult caregiver) agreed to participate in the research study, he or she was asked to read the consent form and indicate understanding and willingness to participate by completing the consent form. Participants were directed to sign the consent form and return it with the rest of the survey materials in the envelope provided. Research participants were assured of their confidentiality regarding their individual responses. This assisted in improving the overall honesty and truthfulness of participant responses to questionnaires.

To facilitate adequate response numbers, two copies of the complete survey packet, including consent forms, were distributed to the students so that two adults in the home could participate. If participants indicated that they were interested in receiving additional educational information or participating in a seminar, they were asked to provide an email address to which information could be sent. Participants were assured that any contact information provided was used only for the purposes of research data and would not be disseminated to any other parties in any way.

After completion of the questionnaires, participants were asked to place survey and consent materials in the envelopes provided and then returned them to school with their child. It is common practice for parents to send permission forms, money for school projects, and other paperwork to the school by way of the student. The envelopes were marked with a neutral designation indicating that it was part of the research project (i.e., not intended for the school administration or teachers). There was no other identifying information on the outside of the envelope. Each homeroom teacher was provided with a

box in which to place envelopes, which was collected by the researcher at a time convenient to the teacher, usually immediately after school dismissal. In this way, the student was not exposed to any portion of the research protocol and had no problems getting the material to the parent or back to school.

Data Analyses

The research data were collectively analyzed to determine relationships between frequency of dysfunctional parenting, and message frame. Data were analyzed through the use of several levels of statistical analysis. Descriptive statistics were computed for all treatment groups. Differential statistical analyses were conducted to calculate for differences between groups. Internal consistencies, means, and standard deviations were computed for all instruments used in the study. The hypotheses of the study were analyzed using a General Linear Model (GLM) framework. The GLM framework includes ANOVA, ANCOVA, MANCOVA, and MANOVA, and multiple regression analysis (Web Center for Social Research Analysis, 2011).

Hypothesis One

a) On the Total Scale measure of the Parenting Scale, females will score higher than males.

b) On the Laxness subscale of the Parenting Scale, females will score higher than males.

c) On the Overreactive subscale of the Parenting Scale, females will score higher than males.

Analysis of hypothesis one. The first hypothesis utilized MANOVA for statistical analysis. This hypothesis was examined to determine differences between

gender of the respondent and scores on the Parenting Scale Total score, and Laxness and Overreactive subscale scores. The independent variable was the gender of the respondent. The dependent variables were the Total score, Laxness subscale score, and Overreactive subscale score on the Parenting Scale.

Hypothesis Two

a) For respondents who score in the high range on the Overreactive subscale of the Parenting Scale, those exposed to a gain-framed message will report a greater likelihood to implement recommendations when compared to a loss-framed message.

b) For respondents who score in the low range on the Overreactive subscale of the Parenting Scale, those exposed to a loss-framed message will report a greater likelihood to implement recommendations when compared to a gain-framed message.

Hypothesis Three

a) For respondents who score in high range on the Overreactive subscale of the Parenting Scale, those exposed to a gain-framed message will report finding the factsheet more persuasive when compared to a loss-framed message.

b) For respondents who score in the low range on the Overreactive subscale of the Parenting Scale, those exposed to a loss-framed message will report finding the factsheet more persuasive when compared to a gain-framed message.

Analysis of hypotheses two and three. The second and third hypotheses utilized MANOVA for statistical analysis. These hypotheses were examined to determine differences between scores on the Overreactive subscale of the Parenting Scale and frame exposure and reported likelihood to implement recommendations as described on the factsheet and reported persuasiveness of the factsheet. The independent variables were

scores on the Overreactive subscale of the Parenting Scale and frame of the factsheet. The dependent variables were reported likelihood to implement recommendations and reported persuasiveness of the factsheet. The pilot study results regarding the researcher-derived Factsheet Attitude Questionnaire indicated no clear factor structure to the items; therefore the individual items from the Factsheet Attitude Questionnaire were included in the MANOVA as separate dependent variables.

Hypothesis Four

a) For respondents who score in the high range on the Laxness subscale of the Parenting Scale, those exposed to a gain-framed message will report a greater likelihood to implement recommendations when compared to a loss-framed message.

b) For respondents who score in the low range on the Laxness subscale of the Parenting Scale, those exposed to a loss-framed message will report a greater likelihood to implement recommendations when compared to a gain-framed message.

Hypothesis Five

a) For respondents who score in the high range on the Laxness subscale of the Parenting Scale, those exposed to a gain-framed message will report finding the factsheet more persuasive when compared to a loss-framed message.

b) For respondents who score in the low range on the Laxness subscale of the Parenting Scale, those exposed to a loss-framed message will report finding the factsheet more persuasive when compared to a gain-framed message.

Analysis of hypotheses four and five. The fourth and fifth hypotheses utilized MANOVA for statistical analysis. These hypotheses were examined to determine differences between scores on the Laxness subscale of the Parenting Scale and frame

exposure and reported persuasiveness of the factsheet. The independent variables were scores on the Laxness subscale of the Parenting Scale and frame of the factsheet. The dependent variables were reported likelihood to implement recommendations and reported persuasiveness of the factsheet. For the purpose of data analyses, the individual items for persuasion and intention on the Factsheet Attitude Questionnaire were not average into one score but entered into the MANOVA as separate dependent variables based on the pilot study results that indicated no clear factor structure to the items.

Hypothesis Six

a) Those respondents who are exposed to a gain-framed message will have a lower incidence of email address disclosure than those exposed to a loss frame.

b) Those respondents who are exposed to a gain-framed message will have a lower interest in attending an educational seminar than those exposed to a loss frame.

Hypothesis Seven

a) Those respondents who are exposed to a loss-framed message will have a higher incidence of email address disclosure than those exposed to a gain frame.

b) Those respondents who are exposed to a loss-framed message will have a greater interest in attending an educational seminar than those exposed to a gain frame.

Analysis of hypotheses six and seven. Chi-square was utilized for statistical analyses of the sixth and seventh hypotheses. These hypotheses were examined to determine the relationship between the frame of the message and disclosure of email address, and frame of the message and attendance at the seminar.

Hypothesis Eight

a) Those respondents who disclose their email address will have lower scores on the Total Scale measure of the Parenting Scale.

b) Those respondents who disclose their email address will have lower scores on the Laxness subscale of the Parenting Scale.

c) Those respondents who disclose their email address will have lower scores on the Overreactive scale of the Parenting Scale.

Hypothesis Nine

a) Those respondents who wish to attend the educational seminar will have lower scores on the Total Scale measure of the Parenting Scale.

b) Those respondents who wish to attend the educational seminar will have lower scores on the Laxness subscale of the Parenting Scale.

c) Those respondents who wish to attend the educational seminar will have lower scores on the Overreactive subscale of the Parenting Scale.

Analysis of hypotheses eight and nine. The eighth and ninth hypotheses utilized MANOVA for statistical analysis. These hypotheses were examined to determine differences between disclosure of email address, attendance at the educational seminar and scores on the Total Scale measure, Laxness subscale, and Overreactive subscale of the Parenting Scale. The independent variables were disclosure of email address and interest in attending an educational seminar. The dependent variables were the Total score, Laxness subscale score, and Overreactive subscale score on the Parenting Scale.

CHAPTER THREE

RESULTS

Participants

Overall Sample

Participants were 114 parents of students of a Kindergarten through 8th grade elementary school affiliated with a small university in the American South. The sample was 72% female (n = 82) and 28% male (n = 32), with an average age of 39 years (SD = .451, *Range* = 29-65). The sample was 78% White/European American (n = 89), 18% Black/African American (n = 21), and 4% Asian/Indian (n = 4). The sample was 92% married, 4% single, and 4% divorced.

Of the families in this sample, 24% had one child, 42% had two children, 28% had three children, and 5% had four children. The families in this sample had an average of about three televisions in the home (M = 3.38, SD = 1.12), ate meals together approximately four to six times per week, and read books together slightly more than two to three times per week. The parents in the sample reported being the primary bedtime caretaker most nights (M = 6.07, SD = 1.76).

The age of the child indicated to be the primary target of the sleep interventions ranged from 5 to 14 years (M = 9.1, SD = 2.55) and age of the secondary target child ranged from 1 to 14 years (M = 7.1, SD = 2.92). Of the children described, 94%

engaged in extracurricular activities; 40% had access to television in the bedroom; 29% had access to a personal cell phone in their bedroom; 16% had access to a personal computer in their bedroom, and 43% had access to video game systems in their bedroom.

Descriptive Statistics and Reliabilities

Table 1 presents the Cronbach's reliability coefficients, means, and standard deviations for the Parenting Scale (PS). The results of a one-sample t-test, t (105) = 4.70, $p < .01$, revealed that the mean on the Parenting Scale Total score for the current sample (M = 2.88) was significantly lower than the mean for the sample (M = 3.1) with which O'Leary et al. (1997) developed the Parenting Scale. The mean for the current sample on the Laxness subscale (M = 2.38) is not significantly different than the mean for the scale development sample (M = 2.8), t (110) = 6.56, $p > .05$. The mean for the current sample on the Overreactive subscale (M = 2.69) is not significantly different than the mean for the scale development sample (M = 3.0), t (109) = 4.58, $p > .05$.

Table 1

Means, Standard Deviations, Range, and Reliabilities for the Parenting Scale

Variables	*n*	*Mean*	*StdDev*	*Variance*	*Cronbach's α*
PSTotal	106	2.88	.48	.23	.774
PSLax	111	2.38	.70	.48	.825
PSOvr	110	2.69	.71	.50	.725

Note: PSTotal = Parenting Scale Total Score; PSLax = Parenting Scale Laxness Subscale; PSOvr = Parenting Scale Overreactive Subscale.

Correlations Between Variables

Table 2 presents the correlations among the subscales and total scores of the Parenting Scale. The Parenting Scale total score was significantly positively correlated with both the Parenting Scale Overreactive subscale ($r = .762, p < .01$) and the Parenting Scale Laxness subscale ($r = .722, p < .01$). The Parenting Scale Overreactive subscale was positively correlated with the PS Laxness subscale ($r = .318, p < .01$). Reported coefficients alpha by Arnold, O'Leary, Wolf and Acker (1993) for the factor and total scores were: Laxness, .83; Overreactivity, .82; Verbosity, .63; and Total, .84. In an observational study, the total score was significantly correlated with observational ratings of parenting, and scores from this measure have been shown to differentiate between clinic and nonclinic groups of children (Arnold et al., 1993).

Table 2

Correlation Matrix of Variables

Variable	1	2	3
1 PSTotal		.762**	.722**
2 PSOvr			.318**
3 PSLax			

Note: PSTotal = Parenting Scale Total Score; PSOvr = Parenting Scale Overreactive Subscale; PSLax = Parenting Scale Laxness Subscale; ** = significant at .01

Hypotheses

Hypothesis One

Hypothesis One (a) stated that females would have significantly higher scores than males on the Total scale of the Parenting Scale. Hypothesis One (b) stated that females would have significantly higher scores than males on the Overreactive subscale of the Parenting Scale. Hypothesis One (c) stated that females would have significantly higher scores than males on the Laxness subscale of the Parenting Scale. To test these hypotheses MANOVA was utilized to determine if there were any differences in measures of dysfunctional parenting due to gender; however, results of MANOVA did not support these hypotheses, $F(2, 102) = .600, p > .05$. Results show women did not differ in their parenting on any of the parenting measures compared to men.

Hypothesis Two

Hypothesis Two (a) stated that those respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain-framed message would report a greater likelihood to implement recommendations when compared to a loss-framed message. Hypothesis Two (b) stated that those respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and were exposed to a loss-framed message would report a greater likelihood to implement recommendations when compared to a gain-framed message. High scores were defined as being greater than 2.55 ($n = 63$) and low scores were defined as less than or equal to 2.55 ($n = 47$). The median observed score was used to determine those scores that fell in the high or low groups; those scores above the median were defined as high and those scores at or below the median were defined as low (for descriptive data see Appendix F Table

A). All questions on the Factsheet Attitude Questionnaire were included as individual dependent variables in the analysis. To test these hypotheses MANOVA was utilized to determine if there were any differences between scores on the Overreactive subscale of the Parenting Scale and frame exposure and reported likelihood to implement recommendations as described on the factsheet. Results of the MANOVA did not support these hypotheses, Wilk's $\lambda = 0.02$, $F(12, 254) = 1.09$, $p > .05$. Results show that (a) respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain frame did not differ in their reported likelihood to implement recommendations when compared to a loss frame, and (b) respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and were exposed to a loss frame did not differ in their reported likelihood to implement recommendations when compared to a gain frame.

Hypothesis Three

Hypothesis Three (a) stated that those respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain-framed message would find the factsheet more persuasive compared to a loss-framed message. Hypothesis Three (b) stated that those respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and were exposed to a loss-framed message would find the factsheet more persuasive compared to a gain-framed message. High scores were defined as being greater than 2.55 ($n = 63$) and low scores were defined as less than or equal to 2.55 ($n = 47$). The median observed score was used to determine those scores that fell in the high or low groups; those scores above the median were defined as high and those scores at or below the median were defined as low (for

descriptive data see Appendix F Table A). All questions on the Factsheet Attitude Questionnaire were included as individual dependent variables in the analysis. To test this hypothesis MANOVA was utilized to determine if any significant differences existed between scores on the Overreactive subscale of the Parenting Scale and frame exposure and reported persuasiveness of the factsheet. Results of the MANOVA did not support these hypotheses, Wilk's $\lambda = 0.02$, $F(12, 254) = 1.09$, $p > .05$. Results show that (a) respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain frame did not differ in their reported level of persuasion when compared to a loss frame, and (b) respondents who scored in the low range on the Overreactive subscale of the Parenting scale and were exposed to a loss frame did not differ in their reported level of persuasion when compared to a gain frame.

Hypothesis Four

Hypothesis Four (a) stated that those respondents who scored in the high range on the Lax subscale of the Parenting Scale and were exposed to a gain-framed message would report a greater likelihood to implement recommendations compared to a loss-framed message. Hypothesis Four (b) stated that those respondents who scored in the low range on the Lax subscale of the Parenting Scale and were exposed to a loss-framed message would report a greater likelihood to implement recommendations compared to a gain-framed message. High scores were defined as being greater than 2.31 ($n = 56$) and low scores were defined as less than or equal to 2.31 ($n = 55$). The median observed score was used to determine those scores that fell in the high or low group; those scores above the median were defined as high and those scores at or below the median were defined as low (for descriptive data see Appendix F Table B). All questions on the Factsheet

Attitude Questionnaire were included as individual dependent variables in the analysis. To test these hypotheses MANOVA was utilized to determine if any significant differences existed between scores on the Laxness subscale of the Parenting Scale and frame exposure and reported likelihood to implement recommendations. Results of the MANOVA did not support these hypotheses, Wilk's $\lambda = 0.02$, $F(12, 254) = 1.09$, $p > .05$. Results show that (a) respondents who scored in the high range on the Laxness subscale of the Parenting Scale and were exposed to a gain frame did not differ in their reported likelihood to implement recommendations when compared to a loss frame, and (b) respondents who scored in the low range on the Laxness subscale of the Parenting scale and were exposed to a loss frame did not differ in their reported likelihood to implement recommendations when compared to a gain frame.

Hypothesis Five

Hypothesis Five (a) stated that respondents who score in the high range on the Laxness subscale of the Parenting Scale and are exposed to a gain-framed message would report finding the factsheet more persuasive compared to a loss-framed message. Hypothesis Five (b) stated that respondents who score in the low range on the Laxness subscale of the Parenting Scale and are exposed to a loss-framed message would report finding the factsheet more persuasive compared to a gain-framed message. High scores were defined as being greater than 2.31 ($n = 56$) and low scores were defined as less than or equal to 2.31 ($n = 55$). The median observed score was used to determine those scores that fell in the high or low groups; those scores above the median were defined as high and those scores at or below the median were defined as low (for descriptive data see Appendix F Table B). All questions on the Factsheet Attitude Questionnaire were

included as individual dependent variables in the analysis. To test these hypotheses MANOVA was utilized to determine if any significant differences existed between scores on the Laxness subscale of the Parenting Scale and frame exposure and reported likelihood to implement recommendations. Results of the MANOVA did not support these hypotheses, Wilk's $\lambda = 0.02$, $F(12, 254) = 1.09$, $p > .05$. Results show that (a) respondents who scored in the high range on the Laxness subscale of the Parenting Scale and were exposed to a gain frame did not differ in their reported level of persuasion when compared to a loss frame, and (b) respondents who scored in the low range on the Laxness subscale of the Parenting Scale and were exposed to a loss frame did not differ in their reported level of persuasion when compared to a gain frame.

Hypothesis Six

Hypothesis Six (a) stated that those respondents exposed to a gain-framed message would have a lower incidence of email address disclosure than those exposed to a loss-frame. Hypothesis Six (b) stated that those respondents exposed to a gain-framed message would have a lower interest in attending an educational seminar than those exposed to a loss frame. Chi-square tests were used to examine the relationship between the frame of the message and either disclosure of email address or wish to attend the seminar and were not significant. Results indicate that (a) respondents exposed to a gain-framed message did not differ in their rate of email address disclosure than those exposed to a loss-framed message, and (b) respondents exposed to a gain-framed message did not differ in their interest in attending an educational seminar from those exposed to a loss-framed message.

Table 3

Chi-square Results for Hypothesis Six

	No Email Given	Email Given	Total
Expected Cell Frequencies			
gain frame	44	16	60
loss frame	40	14	54
total	84	30	114
Observed Cell Frequencies			
gain frame	44	16	60
loss frame	40	14	54
total	84	30	114
			$\chi^2 = .008$

($p = .929$, not significant at .05 level)

Hypothesis Seven

Hypothesis Seven (a) stated that respondents exposed to a loss-framed message would have a higher incidence of email address disclosure than those exposed to a gain frame. Hypothesis Seven (b) stated that respondents exposed to a loss-framed message would have a higher incidence of interest in attending an educational seminar than those exposed to a gain frame. Chi-square tests were used to examine the relationship between the frame of the message and either disclosure of email address or interests in attending the seminar but were not significant. Results indicate that (a) respondents exposed to a loss-framed message did not differ in their rate of email address disclosure than those exposed to a gain-framed message, and (b) respondents exposed to a loss-framed message did not differ in their interest in attending an educational seminar from those exposed to a gain-framed message.

Table 4

Chi-square Results for Hypothesis Seven

	No Interest	Interested	Total
Expected Cell Frequencies			
gain frame	57	2.6	60
loss frame	52	2.4	54
total	109	5.0	114
Observed Cell Frequencies			
gain frame	56	4	60
loss frame	53	1	54
total	109	5	114
			$\chi^2 = 1.571$

($p = .210$, not significant at .05 level)

Hypothesis Eight

Hypothesis Eight (a) stated that respondents who disclose their email address would have a lower score on the Total Scale of the Parenting Scale. Hypothesis Eight (b) stated that respondents who disclose their email address would have lower scores on the Laxness subscale of the Parenting Scale. Hypothesis Eight (c) stated that respondents who disclose their email address would have lower scores on the Overreactive subscale of the Parenting Scale. To test these hypotheses, MANOVA was utilized to determine if differences between disclosure of email address, attendance at the educational seminar, and scores on the Total Scale measure, Laxness subscale, and Overreactive subscale of the Parenting Scale were significantly different. Results of the MANOVA did not support these hypotheses, $F(3, 102) = .336, p > .05$. Results indicated that (a) respondents who disclosed their email address did not differ in the scores on the Total Scale of the Parenting Scale compared to those who did not disclose their email address, (b) respondents who disclosed their email address did not differ in their scores on the

Laxness subscale of the Parenting Scale compared to those who did not disclose their email address, and (c) respondents who disclosed their email address did not differ in their scores on the Overreactive subscale of The Parenting Scale compared to those who did not disclose their email address.

Hypothesis Nine

Hypothesis Nine (a) stated that respondents who have an interest in attending the seminar would have a lower score on the Total Scale of the Parenting Scale. Hypothesis Nine (b) stated that respondents who have an interest in attending the seminar would have lower scores on the Laxness subscale of the Parenting Scale. Hypothesis Nine (c) stated that respondents who had an interest in attending the seminar would have lower scores on the Overreactive subscale of the Parenting Scale. To test this hypothesis, MANOVA was utilized to determine if differences between disclosure of email address, interest in attending an educational seminar and scores on the Total Scale measure, Laxness subscale, and Overreactive subscale of the Parenting Scale were significantly different. Results of the MANOVA did not support these hypotheses, $F(3, 102) = .193, p > .05$). Results indicated that (a) respondents who were interested in attending a seminar did not differ in the scores on the Total Scale of the Parenting Scale compared to those who did not request a seminar, (b) respondents who were interested in attending a seminar did not differ in their scores on the Laxness subscale of the Parenting Scale compared to those who did not request a seminar, and (c) respondents who were interested in attending a seminar did not differ in their scores on the Overreactive subscale of The Parenting Scale compared to those who did express interest in attending a seminar.

CHAPTER FOUR

DISCUSSION

This section begins with a general overview of the results, followed by a discussion of each hypothesis. The general implications for the study is also discussed, followed by the limitations of the study and suggestions for future research.

General Overview of Results

Expected correlational relationships between subscales of the Parenting Scale were present, with all other analyses lacking statistical significance. With the literature in this field reporting such a wide variety of results and current research into many possible influences on the way messages work on the behavior of individuals, these results are consistent with recent meta-analyses of the literature (O'Keefe & Jensen, 2006, 2009; Rothman et al., 1993). For example, some individual characteristics that have been postulated to affect the susceptibility of an individual to a given message frame are affect, cognitive processing, regulatory fit, personality, culture, gender, and self-efficacy (Mahoney et al., 2011). It is possible that the current study did not accurately pinpoint the most influential combination of individual qualities of the parent respondents. It also may be that the children's sleep behaviors were too far removed from those receiving the intervention (the parents) such that any effect was undetectable.

The researcher-derived Factsheet Attitude Questionnaire did not demonstrate a strong factor analysis, possible due to the issue of self-referencing. The Factsheet Attitude Questionnaire may not have been able to adequately address the distal relationship between the respondent and the action of the intervention, the child. The concept of self-referencing (how one's behavior may affect the self or others) may have interacted with the concept of personally relevant information (the extent to which the attitudinal issue under consideration is of personal importance to the decision maker) in ways that could not be predicted, and both of these factors may have interacted with the message frame in undetectable ways (Loroz, 2007; Uskul & Oyserman, 2010).

In addition, presently, the research on message framing is very dynamic, with many models and theories being tested and the literature constantly expanding. It is possible that at this time relationships amongst variables used in the foundation of this study are too ambiguous to render the hypotheses supportable as stated. For review, see Mahoney, Buboltz, and Levin (2011). It also possible that email may not be the preferred method of communication for respondents in this study and therefore limited the behavioral response rate.

Hypothesis One

Hypothesis One stated that on the Total, Overreactive subscale, and Laxness subscale of the Parenting Scale, females would have significantly higher scores than males, but was not supported. MANOVA did not reveal significant differences in means for the Total scale score and the Overreactive subscale of the Parenting Scale. The sample was 28% male, and 75% of these males reported being the primary caretaker at bedtime five or more nights per week. These findings suggest that in this sample male

and female caregivers shared parenting responsibilities more equally than occurs in the general parenting population (Yeung et al., 2001). It is also possible that this sample population presented with a higher percentage of authoritative parents than the general population, resulting in fewer permissive and over-reactive behaviors.

Hypothesis Two

Hypothesis Two (a) stated that those respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain-framed message would report a greater likelihood to implement recommendations when compared to a loss-framed message. Hypothesis Two (b) stated that those respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and were exposed to a loss-framed message would report a greater likelihood to implement recommendations when compared to a gain-framed message. Results indicate that respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain frame were not more likely to implement recommendations, as indicated by items from the researcher-derived questionnaire, than those respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and exposed to a loss-framed message.

High scores on the Overreactive subscale of the Parenting scale indicate a higher incidence of dysfunctional parenting behaviors, reflecting discipline mistakes such as displays of anger, meanness, and irritability. For the purposes of this study, subjects who indicated the frequent use of over-reactive dysfunctional discipline were construed to be risk-avoidant, meaning that these parents both avoided the exercise of control and avoided conflict with the child in the short-term (Arnold et al., 1993; Baumrind, 1966;

Rhoades & O'Leary, 2007). In this case, to be risk-avoidant was to desire a quick solution to bedtime resistance by arguing, threatening, or yelling. It was hypothesized that these over-reactive, risk-avoidant parents would intend more to implement the factsheet recommendations when exposed to a gain-framed message because gain-framed messages more effectively promote preventive health behaviors, and health prevention behaviors are usually considered to be risk-avoidant (Rothman et al., 2006). Since this effect was not seen, it is possible over-reactive parents are not risk-avoidant, and that non-over-reactive parents are not risk-attracted. This would suggest that avoiding conflict with the child by utilizing less effective means of parenting does not fulfill the Rothman et al. (1993) formulation of a preventive behavior, and that being attracted to risk by confronting the child with more effective means of parenting does not fulfill the Rothman et al. formulation of a detection behavior.

Another possible explanation for these results is that the current study focused on how the behaviors related to another person (the child of the respondent) rather than one's self and therefore might not adequately parallel the original conceptualization of performance of health behaviors insofar as previous research on message framing and health was about the individual decision maker considering information about his or her own health, not that of another person. In this regard the researcher-derived Factsheet Attitude Questionnaire might be lacking because this distal relationship has never before been studied. Being attracted to or avoiding risk has only been measured in the individual whose health might be affected (Bartels et al., 2010; Bartels et al., 2006; Rothman et al., 1993). Also, health in the original context typically referred to medical issues such as

those in cancer screenings. Therefore the application of this health concept to sleep behaviors may not be conceptually relevant.

Hypothesis Three

Hypothesis Three (a) stated that those respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain-framed message would report finding the factsheet more persuasive compared to a loss-framed message. Hypothesis Three (b) further stated that those respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and were exposed to a loss-framed message would report finding the factsheet more persuasive compared to a gain-framed message. Results indicate that respondents who scored in the high range on the Overreactive subscale of the Parenting Scale and were exposed to a gain frame were not more likely to report finding the factsheet more persuasive, as indicated by items from the researcher-derived questionnaire, than those respondents who scored in the low range on the Overreactive subscale of the Parenting Scale and exposed to a loss-framed message.

High scores on the Overreactive subscale of the Parenting scale entail more dysfunctional parenting behaviors, reflecting discipline mistakes such as displays of anger, meanness, and irritability. For the purposes of this study, participants who indicated the frequent use of over-reactive dysfunctional discipline were construed to be risk-avoidant, meaning these parents were punitive and used forceful measures such as physical punishment (Arnold et al., 1993; Baumrind, 1966; Rhoades & O'Leary, 2007). In this case, to be risk-avoidant was to desire a quick solution to bedtime resistance by arguing, threatening, or yelling. It was hypothesized that these over-reactive, risk-

avoidant parents would report finding the factsheet more persuasive when exposed to a gain-framed message because gain-framed messages more effectively promoted preventive health behaviors, and health prevention behaviors are usually considered to be risk-avoidant (Rothman et al., 2006). Since this effect was not observed, it is possible over-reactive parents are not risk-avoidant, and that non-over-reactive parents are not risk-attracted. This would suggest that avoiding conflict with the child by utilizing less effective means of parenting does not fulfill what Rothman et al. (1993) formulated to be a preventive behavior, and that being attracted to risk by confronting the child with more effective means of parenting does not exemplify what Rothman et al. meant by a detection behavior.

Another possible explanation for these results is that the current study focused on how the behaviors related to another person (the child of the respondent) rather than one's self and therefore might not adequately parallel the original conceptualization of performance of health behaviors, which focused on how a behavior affected the respondent's own health (Rothman et al., 1993). Also, medical issues such as cancer screenings were the original basis for the health behavior context, therefore the application of this health concept to sleep behaviors may be inadequate. The researcher-derived Factsheet Attitude Questionnaire may have been inadequate to accurately capture the distal relationship between the parent respondent and target of the intervention, the child.

Hypothesis Four

Hypothesis Four (a) stated that those respondents who scored in the high range on the Lax subscale of the Parenting Scale and were exposed to a gain-framed message

would report a greater likelihood to implement recommendations compared to a loss-framed message. Hypothesis Four (b) stated that those respondents who scored in the low range on the Lax subscale of the Parenting Scale and were exposed to a loss-framed message would report a greater likelihood to implement recommendations compared to a gain-framed message. However, results did not support these hypotheses and indicated that respondents who scored in the high range on the Lax subscale of the Parenting Scale and were exposed to a gain frame were not more likely to implement recommendations, as indicated by items from the researcher-derived questionnaire, than those respondents who scored in the low range on the Lax subscale of the Parenting Scale and were exposed to a loss-framed message.

High scores on the Lax subscale of the Parenting scale suggest more dysfunctional parenting behaviors, reflecting discipline mistakes such as eventually giving in and avoiding taking control. For the purposes of this study, participants who indicated the frequent use of lax dysfunctional discipline were construed to be risk-avoidant, meaning these parents both avoided the exercise of control and avoided conflict with the child in the short-term (Arnold et al., 1993; Baumrind, 1966; Rhoades & O'Leary, 2007). In this case, to be risk-avoidant was to desire a quick solution to bedtime resistance by allowing exceptions and by frequently giving in to requests. It was hypothesized that these lax, risk-avoidant parents would report a greater likelihood to implement recommendations when exposed to a gain-framed message because gain-framed messages more effectively promoted preventive health behaviors, and health prevention behaviors are generally risk-avoidant (Rothman et al., 2006). Since this effect was not seen, it is possible lax parents are not risk-avoidant, and that non-lax parents are

not risk-attracted. This would suggest that avoiding conflict with the child by utilizing less effective means of parenting is not supported by the Rothman et al. (1993) description of a preventive behavior, and that being attracted to risk by confronting the child with more effective means of parenting is not supported by the Rothman et al. (1993) conceptualization of a detection behavior.

Another possible explanation for these results is that the current study focused the possible effect on another individual's health condition rather than on the respondent's own health condition, which may not adequately parallel the original conceptualization of performance of health behaviors. The researcher-derived Factsheet Attitude Questionnaire may not have been adequate for detecting the complex relationship between the parent as respondent to the questionnaire and the child as target of the behavioral intervention. In addition, because this study did not limit the use of health behaviors in the strict context of medical issues but expanded health to include sleep behaviors, the interpretation may not support the hypotheses as proposed.

Hypothesis Five

Hypothesis Five (a) stated that those respondents who scored in the high range on the Lax subscale of the Parenting Scale and were exposed to a gain-framed message would report finding the factsheet more persuasive compared to a loss-framed message. Hypothesis Five (b) stated that those respondents who scored in the low range on the Lax subscale of the Parenting Scale and were exposed to a loss-framed message would report finding the factsheet more persuasive compared to a gain-framed message. Results indicate that respondents who scored in the high range on the Lax subscale of the Parenting Scale and were exposed to a gain frame were not more likely to report finding

the factsheet more persuasive, as indicated by items from the researcher-derived questionnaire, than those respondents who scored in the low range on the Lax subscale of the Parenting Scale and exposed to a loss-framed message.

High scores on the Lax subscale of the Parenting scale indicate a higher incidence of dysfunctional parenting behaviors, reflecting discipline mistakes such as eventually giving in and avoiding taking control. For the purposes of this study, subjects who indicated the frequent use of lax dysfunctional discipline were construed to wish to avoid risk, meaning these parents both avoided the exercise of control and avoided conflict with the child in the short-term (Arnold et al., 1993; Baumrind, 1966; Rhoades & O'Leary, 2007). In this case, to avoid risk was to desire a quick solution to bedtime resistance by allowing exceptions and by frequently giving in to requests. It was hypothesized that these lax, risk-avoidant parents would report finding the factsheet more persuasive when exposed to a gain-framed message because gain-framed messages more effectively promote preventive health behaviors, and health prevention behaviors are usually considered to be consistent with avoiding risk (Rothman et al., 2006). Since this effect was not seen, it is possible lax parents are not trying to avoid risk, and that non-lax parents are not attracted to risk. This would suggest that avoiding conflict with the child by utilizing less effective parenting does indicate what Rothman et al. (1993) determined to be indicative of a preventive behavior, and that being attracted to risk by being willing to confront the child with more effective means of parenting does not indicate what Rothman et al. (1993) considered to be a detection behavior.

The use of message framing to promote specific health behaviors was originally used for more traditional medical interventions, and the application to sleep behavior may

not support these hypotheses as written. In addition, the transference of the intervention from the message-reader to the child of the message-reader might have inhibited the effect of the intervention, and the researcher-derived Factsheet Attitude Questionnaire may have been inadequate to address this relationship even though it was modeled on earlier research in this general area.

Hypotheses Six

Hypothesis Six (a) stated that respondents exposed to a gain-framed message would have a lower incidence of email address disclosure than those exposed to a loss frame. Hypothesis Six (b) stated that respondents exposed to a gain-framed message would have a lower interest in attending an educational seminar than those exposed to a loss frame. These hypotheses were not supported.

Individuals who avoid risk in a health-behavior context are more likely to be influenced by a message written with a gain frame due to their risk aversion. Preventive health behaviors (i.e., those that involve maintaining good health or minimize risk) are considered to be risk-avoidant (Bartels et al., 2010; Rothman et al., 2006). Therefore, individuals who select preventive behaviors, such as maintaining the status quo or being noncommittal toward action, are more likely influenced by a gain-framed message.

It is also possible that if the frames are written adequately, there is no effect to be measured. Recently published meta-analyses suggest the theory of a gain-frame or loss-frame effect to be found has been questioned by prominent researchers in the field (Mahoney et al., 2011; O'Keefe & Jensen, 2006, 2009). With the various effects of individual differences in the interpretation of these messages, it may be that this sample

population was not appropriately targeted by the self-other concept, the personal involvement concept, or by a combination of these factors.

Hypothesis Seven

Hypothesis Seven (a) asserted that respondents exposed to a loss-framed message would have a higher incidence of email address disclosure than those exposed to a gain frame. Hypothesis Seven (b) further asserted that respondents exposed to a loss-framed message would have a higher interest in attending an educational seminar than those exposed to a gain frame. Both went unsupported.

Individuals who seek to reduce their risk in a health-behavior context are more likely to be influenced by a message written with a loss frame due to their risk attraction. Detective health behaviors (i.e., those that involve discovering a problem previously unknown) are considered to be risk-attracted (Bartels et al., 2010; Rothman et al., 2006). Therefore, individuals who select detective behaviors, such as seeking out additional information and actively pursuing interventions to resist the onset of future problems, will thus be more likely influenced by a loss-framed message.

It is also possible that if the frames were written adequately, that there is simply no effect to be measured. As recently published meta-analyses have suggested, the idea that there is a gain frame or loss frame effect to be found has been questioned by prominent researchers in the field (Mahoney et al., 2011; O'Keefe & Jensen, 2006, 2009). With the various effects of individual differences in the interpretation of these messages, it may be that this sample population was not appropriately targeted by a combination of factors including the self-other concept and the personal involvement concept. It is also

possible that email was not the preferred form of contact and therefore limited behavioral response rate.

Hypotheses Eight

Hypotheses Eight (a) stated that respondents who disclose their email address would have lower scores on the Total Scale of the Parenting Scale. Hypothesis Eight (b) stated that those respondents who disclose their email address would have lower scores on the Laxness subscale of the Parenting Scale. Hypothesis Eight (c) stated that those respondents who disclose their email address would have lower scores on the Overreactive subscale of the Parenting Scale. Results indicated that whether or not a respondent chose to request additional information by providing an email address was not significantly related to the respondent's score on the Parenting Scale Total, Laxness subscale or Overreactive subscale, which suggests that the degree of dysfunctional parenting exhibited by a respondent did not influence his or her desire to gather additional information.

Lower scores on the Parenting Scale (total scale and subscales) entail more effective discipline. This suggests that they are attracted to risk in the sense that in the face of noncompliant and aggressive behaviors of their children, these respondents provide clear, firm, and consistent consequences. Being attracted to risk signifies a detection-type behavior that is thought to include behaviors such as seeking out additional information among other behaviors.

One possible reason that these hypotheses were not supported is that this sample may not have fulfilled the model regarding attraction to risk and the assumption made here that the action of requesting more information via email is consistent with a

detection-type behavior and, therefore, being attracted to risk. In addition, the present respondents might have differed on any number of characteristics that are reviewed in the literature and thought to interact with message frames such as affect, cognitive processing, temporal distance, or mood. It is possible that the assumptions that predicated the use of sleep behavior in children (i.e., having a high degree of personal involvement by the respondent), is not supported. It is also possible that the distance that the intervention was intended to travel, from the respondent to influencing the behavior of the child, created a sort of cognitive distance that was too broad for the influence of the message frame to act.

Hypothesis Nine

Hypothesis Nine (a) asserted that respondents who were interested in attending the educational seminar would have lower scores on the Total Scale of the Parenting Scale. Hypothesis Nine (b) stated that those respondents who were interested in attending the educational seminar would have lower scores on the Laxness subscale of the Parenting Scale. Hypothesis Nine (c) stated that those respondents who were interested in attending the educational seminar would have lower scores on the Overreactive subscale of the Parenting Scale. None of these hypotheses were confirmed.

Lower scores on the Parenting Scale (total scale and subscales) entail effective discipline in parents. This suggests that they are attracted to risk in the sense that in the face of noncompliant and aggressive behaviors of their children, these respondents provide consequences that are clear, firm, and consistent. Being attracted to risk signifies a detection-type behavior that is thought to include behaviors such as pursuing alternative interventions to resist future problems.

One possible reason that these hypotheses were not supported is that this sample may not have fulfilled the model regarding attraction to risk and the assumption made here that the interest in attending the seminar is consistent with a detection-type behavior and, therefore, attraction to risk. In addition, reviews of the literature suggest that the sample respondents could differ on any number of characteristics hypothesized to interact with message frames such as affect, cognitive processing, temporal distance, mood, etc. It is possible that using the construct of sleep behavior in children because of the inferred high degree of personal involvement of the parents is not supported.

Implications

Any study that seeks to clarify issues of sleep management for children and adolescents is likely to shed light on a problem that nearly all parents deal with at some point in time. This study has some implications for the research field, as well as for clinical professionals who encounter sleep disturbance in clients.

In this sample, the majority of respondents indicated that they had a significant general knowledge of sleep, especially regarding how to ensure high-quality sleep in children. In fact, in contrast to a study in 2003 by the International Pediatric Sleep Education Task Force (Thompson & Christiakis, 2005), parents of this study believed themselves to be "very familiar" with the material in the factsheet. This suggests that public health interventions designed to educate the public about sleep issues in children appear to be working, at least in this particular sample. Interestingly, many of the respondents reported being interested in changing their own sleep behaviors, which seems to indicate an understanding that sleep disturbance is not an issue only for children. As important as sleep is to the health and well being of all individuals (Owens,

2005; National Sleep Foundation, 2004), the presence of a basic understanding of healthy sleep in this sample should be considered in future research about sleep. Future research should confirm this general knowledge as well as clarify what it is that parents believe about sleep behavior, and their role in managing it in their children.

This study also suggests that primary caretaker roles in families are changing (Yeung et al., 2001). Though more women than men responded to the study, the men who did respond indicated that they were responsible for bedtimes as the primary caretaker several times per week. This suggests that future interventions about sleep behavior should not be targeted exclusively to female caretakers. Also, the women in this study did not report higher rates of dysfunctional discipline than men (Arnold et al., 1993). This might also suggest a changing dynamic in households with children that could affect the way the family incorporates information into direct episodes of parenting, or seeks to change family behavior patterns. If one parent is no longer the exclusive caretaker or disciplinarian, the effect of messages may become diffuse across both parents as they attempt to implement recommendation or become confused with two separate interpretations of how the recommendation should be implemented.

Families in this study owned an average of three televisions. Of the children described, 94% engaged in extracurricular activities, 40% had access to television in the bedroom, 29% had access to a personal cell phone in their bedrooms, 16% had access to a personal computer in their bedrooms, and 43% had access to video game systems in their bedrooms. However, sleep difficulties affect between one-quarter and three-quarters of all children in the U.S. (Chamness, 2008; Dahl, 1996; Eckerberg, 2002; Ferber, 1987 & 1995; Gregory & O'Connor, 2002; Wolfson, 1996). It is clear that TV has become

practically essential to the lives of families. Even with the increase in other forms of technology on which to watch videos or play games, television still seems to be a central electronic device in many homes given the fact that so many families had more than one set. Reviews of the literature report that on average children in the US watch 19 hours of television per week (Owens et al., 1999). This is an important consideration given how many families in this study had multiple televisions, and that almost half of the children had access to televisions in their own bedrooms. This fact of American family life is something that future interventions are going to have to work around rather than seek to eliminate, especially when parents reading with children only occurred about three times per week in this sample.

Most of the families in this sample also had multiple children. Taking into account the balance those parents must make regarding different bed times or different activity levels of children is a fact that could be addressed in future research. Exploring how a family copes with different bedtimes for children might reveal opportunities for future interventions. Considering that nearly all of the children in this sample participated in some type of extracurricular activity, parents seem to find these out-of-school experiences highly valuable. It may be that parents find these activities so valuable that they are willing to risk sleep disturbance to receive the benefit of the activity. In this case, targeting the parents with an intervention or message that seeks to balance the benefits of extracurricular activities with the requirements for healthy sleep would seem appropriate.

The fact that the intervention was targeted toward an individual other than the message reader is also an important consideration. Parents were chosen as subjects for their presumed high level of personal involvement in the issue of sleep behavior in

children, but this relationship to the message has not been previously studied. Several groups of researchers are exploring different models of decision-making as it relates to message framing and personal involvement. As discussed earlier, Maheswaran and Myers-Levy (1990) hypothesized that for an individual decision maker, finding the message to be personally highly involving would lead to the loss frame being more persuasive because the more involved the decision maker is with the issue in the message, the deeper or more detailed the cognitive processing is. This deep level of processing (also referred to as systematic processing) leads to an emphasis on the negative information and causes the loss frame to be prominent in the mind of the decision maker, and is therefore more persuasive. Since this effect was not seen in the current research, it is possible that this deep level of processing was not activated in the respondents because of the distance the message reader was from the targeted individual (the child). It is also possible that the researcher-derived Factsheet Attitude Questionnaire, although modeled on similar research, was inadequate to address this distance. Also, Loroz (2007) argued that the reference point, either self (this is how behavior affects one's self) or self-other (how behavior affects others) is a process of personal involvement with a message and resource activation for processing the message, which therefore moderated the effectiveness of a message frame. Because the intervention in this design may have activated mental representations of others, which are less distinctive and less accessible according to Loroz (2007), fewer cognitive resources were activated and the message and the message on the factsheet was not cognitively demanding enough (Loroz, 2007). In this regard the researcher-derived Factsheet Attitude

Questionnaire may have been limited in its ability to adequately get respondents to access the appropriate cognitive resources.

Limitations and Suggestions for Future Research

This section will address the limitations of the current study and suggestions for future research. There are several limitations to the current study. First is the generalizability of the study due to the narrowness of the sample. This sample is not representative of the general population because of the laboratory nature of the school from which it was drawn. The sample population scores on the Parenting Scale Total scale were significantly lower than those reported by O'Leary et al. (1997). Also, this sample is geographically situated in such a place that certain results may not generalize to other parts of the country. In addition, the sample was predominantly female and identified as ethnically white, which also may reduce generalizability to the general population. Though regulated by the same state standards as other public schools, this particular school has a semi-selective admission process, which may indicate these parents had a higher degree of involvement in the lives of their children than parents in other local schools. These factors may make generalizability to other types of schools (public non-laboratory, private) uncertain.

In addition, participation was open to all parents or caregivers at the school. Having a diagnosed or even identified sleep disturbance or difficulty was not a requirement for participation. Given the predominance of sleep disturbance in children, not utilizing the presence of a sleep disturbance for participation was considered reasonable. However, the current sample may have been unable to benefit from the

intervention implemented because of a lack of sleeping difficulties or because the participants reported a high degree of pre-existing knowledge about the subject.

Also, the current study followed a self-report format. Therefore, the present researcher assumed that the participants' responses were truthful and accurate. Self-reporting questionnaires composed of 3-4 items are often used to collect data on perceptions of and written material as well as intentions to complete an advocated behavior (Ajzen et al., 2009; Detweiler et al., 1999; Jung & Villegas, 2011; Loroz, 2007; Maheswaran & Myers-Levy, 1990; Bartels et al., 2010; Sherman et al., 2006; Updegraaf et al., 2007; Uskul & Oyserman, 2010; Myers-Levy & Peracchio, 1996; Keller, et al., 2003; Abhyankar et al., 2008; Jung & Villegas, 2011). There was no measure of social desirability, though this possibly played a role in the Parenting Scale data as well as the researcher-derived Factsheet Attitude Questionnaire. It is possible that parents were concerned about being compared to other parents, even though strict confidentiality was ensured.

Also, just reading the Parenting Scale questions may have caused some respondents to change the way they interacted with the sleep factsheet and answered follow-up questions regarding attitudes about the sleep questionnaire. It may be difficult for individuals to report a certain degree of ignorance about sleep issues, especially after reading the sleep factsheet given its emphasis on proper sleep behavior and the parents' role in ensuring such behavior. Additionally, the request for an email address might be an ineffective measure of interest or intent considering the ubiquity of email use as well as a desire for privacy.

In addition, if there had been more respondents, the Parenting Scale could have been analyzed in a way that focused on the extreme scores, either high or low. In the current research, there were not enough respondents to focus on the extreme scores; therefore, a median split was used to differentiate between high and low scores for the purposed of data analysis. However, it is possible that a focus on those who scored extremely high or extremely low on the Parenting Scale would have other consequences, such as additional limits to generalizability due to the behaviors that manifest at these levels. Future studies would be needed to address the behavior differences in these groups.

Since the Factsheet Attitude Questionnaire was researcher-derived, it may not have targeted the appropriate personal characteristics of the respondents who would have led to different results (Mahoney et. al., 2011). Typically, questions are combined to form an index score of the presented materials (Ajzen et al., 2009; Updegraaf et al., 2007; Myers-Levy & Peracchio, 1996; Keller et al., 2003; Bartels et al., 2010). As the pilot study did not suggest a clear factor structure for the items in the current Factsheet Attitude Questionnaire, the questions were used independently in data analyses rather than as indexes or subscales. Although the questions were developed to correspond to the literature theoretically and semantically, it is possible that with additional studies a clear factor structure could be determined and subscales could be developed. It is also possible that the combination of instruments did not facilitate the gathering of the most pertinent data.

Given these limitations, several suggestions for future research follow. Expanding the study to incorporate sample from a broader population diverse in age, geographic

region, ethnicity, and type of school is desirable. Also, including more than one type of school or performing the same design at multiple schools might provide a breadth of data not seen here.

The current study could have been expanded to include a measure of sleep behavior in children to compare against national data. If the sample was limited to those families that report having difficulty with sleep behaviors, to uncover the level of sleep disturbance, the effect of the factsheet intervention might be more dramatic. In the same way, determining the baseline level of knowledge of the sample before the distribution of the factsheet might enable researchers to tailor the factsheet to the needs of the sample population more accurately. Though the data supports written information as an effective method of intervention for parents of children with sleep problems (Eckerberg, 2002; McMahon & Forehand, 1981; Seymour et al., 1989), the message framing research indicates that tailoring the message frame to target specific individual characteristics of the message reader is an important factor in effectiveness.

In future research, the targeting of specific characteristics might go so far as to invest in gathering information on the processes of behavior change in the respondents. According to Pelletier and Sharp (2008), the process of behavior change is one of detection, decision, and implementation (Pelletier & Sharp, 2008). In regard to message framing, the authors argued that messages should be targeted toward an individual's specific concerns, but also communicated in such a way to maximize the influence on the thoughts of the specific phase of the decision maker (Pelletier & Sharp, 2008). This is consistent with the work of Rothman and Salovey (2007), who argue that a persuasive message, to have optimal effectiveness, should be guided by the process by which people

change their behavior (Rothman & Salovey, 2007). It is possible that asking the respondents *how* they plan on implementing the recommendations in the factsheet might actually facilitate the behavior change process.

Finally, a follow-up questionnaire could provide useful data regarding determining the effectiveness of the message on the factsheet that did not relate to gathering more information or attending a seminar. As discussed earlier, it is possible that the behaviors of requesting information and/or attending a seminar did not adequately fulfill the prevention/detection model for risk attractive or risk aversive behavior. Using a follow-up questionnaire would have the same self-report limitations but might provide a short-term snapshot of actual reportable behavioral change.

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APPENDIX A

HUMAN USE APPROVAL

LOUISIANA TECH
UNIVERSITY

MEMORANDUM

OFFICE OF UNIVERSITY RESEARCH

TO: Ms. Aimee Blackham and Dr. Janelle McDaniel

FROM: Barbara Talbot, University Research

SUBJECT: HUMAN USE COMMITTEE REVIEW

DATE: March 14, 2012

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

"Message Framing Effects in the Delivery of Sleep Hygiene Information to Parents of Elementary and Middle School Children"

HUC 955

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. ***This approval was finalized on March 14, 2012 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond March 14, 2013.*** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-4315.

APPENDIX B

FACTSHEET & FACTSHEET ATTITUDE QUESTIONNAIRE

Did you know...

... sleep has been linked to learning, attention, and other cognitive functions important to development?

... 40% of parents report sleep problems in their children?

... there are things that <u>you</u> can do to help your child get a good night's sleep?

The National Sleep Foundation[1] and the American Association of Pediatrics[2] report that a consistent bedtime routine is one of the most important things you can do to help your child prepare for a good night's sleep. Keeping the sleeping environment cool, dark, and quiet are also crucial. Recent research suggests that limiting television watching, computer or video game playing, and cell phone use before bedtime is essential for high quality sleep.[3]

Children between the ages of 5 and 12 years require about ***10 to 11 hours*** of sleep per night, and older children require ***at least 9 hours***. This can be difficult to achieve when afterschool sports, homework, and time with family and friends are all competing for your child's attention.[4] Keep in mind that when your kids don't sleep well, it can have an affect on the whole family.[5] Sleep is the foundation for all daytime activities, as well as an overall high quality of life.[6]

If you <u>do</u> ensure that your child is getting adequate quantity and quality of sleep, your child may:

- concentrate better and maintain focus at school[7]
- feel less tired during the day and have more energy
- be emotionally stable and less moody
- experience fewer accidents[8]
- be more likely to maintain a healthy weight
- be less likely to develop anxiety and depression in childhood[9]
- be able to maintain a positive mood
- be less irritable, frustrated, agitated, or aggressive
- be at lower risk for depression and anxiety disorders as an adult

[1]National Sleep Foundation, http://www.sleepfoundation.org/. [2] American Association of Pediatrics, http://www.healthychildren.org/. [3] American Association of Pediatrics (2011). *Pediatrics, 128*, 201-208. [4] Carskadon (1990). *Pediatrician, 17*, 5-12. [5] Chamness (2008). *Pediatric Annals, 37*, 502-508. [6] Owens (2005). *Pediatrics, 115*, 201-203. [7] Sadeh, Gruber & Raviv (2003). *Child Development, 73*, 444-455. [8] O'Brien & Mindell (2005). *Behavioral Sleep Medicine, 3*, 113-133. [9] Ganswich, Babiss, Malaspine, Turner, Zammit & Posner (2010). *Sleep, 33*, 97-106. [10] Gregory & O'Connor (2002). *J. of the Am. Acad. Child Adolesc. Psychiatry, 41*, 964-971.

1. Before reading the "Sleep" factsheet, how familiar were you with sleep behavior in children?

1	2	3	4	5
Not familiar at all		*Somewhat*		*Very familiar*

2. To what extent do you currently practice the recommendations listed in the factsheet?

1	2	3	4	5
Never		*Sometimes*		*Always*

3. If you were *not familiar* with the information in the factsheet, to what degree did the factsheet persuade you that sleep behaviors in children is important? *(If you were already very familiar with this information skip this question).*

1	2	3	4	5
Did not persuade me				*Persuaded me a great deal*

4. If your child has a television or computer in his or her room, are you considering removing these items after reading the "Sleep" factsheet? *(If your child does not have these items in his or her room, skip this question).*

1	2	3	4	5
Will not remove		*Will set more limits*		*Definitely will remove*

5. To what degree did the factsheet support your beliefs about the importance of sleep in children?

1	2	3	4	5
Did not support				*Supported a great deal*

6. If you *did not* have a bedtime routine before reading the information in the "Sleep" factsheet, are you considering starting a nightly bedtime routine for your child? *(If you already have a routine, skip this question).*

1	2	3	4	5
No, not considering starting a routine		*Maybe*		*Yes, will consider a routine*

7. How much did the factsheet confirm that you are taking proper steps to support healthy sleep?

1	2	3	4	5
Did not confirm		*Partially confirmed*		*Confirmed a great deal*

8. After reading the "Sleep" factsheet, are you going to change or adjust anything about the way you handle sleep in your home?

1	2	3	4	5
Nothing needs to be changed		*I will adjust some things*		*I will change many things*

9. To what degree will you change how you monitor your child's sleep after reading the "Sleep" factsheet?

1	2	3	4	5
Will monitor a lot less	*Somewhat less*	*Neither*	*Somewhat more*	*Will monitor a lot more*

10. To what degree did the "Sleep" factsheet convince you that listening to news stories or reading articles about sleep research would benefit your family?

1	2	3	4	5
Did not convince me		*Convinced me somewhat*		*Convinced me a great deal*

11. After reading the "Sleep" factsheet, to what degree will you change or adjust *your own* sleep behavior to improve the quality or quantity of *your* sleep?

1	2	3	4	5
I will not change anything		*I will change a few things*		*I will change many things*

12. After reading the "Sleep" factsheet, do you think you will seek out more information on sleep behavior in children?

1	2	3	4	5
No, will not seek more info		*I might seek more info*		*Definitely will seek more info*

APPENDIX C

DEMOGRAPHIC FORM

Please provide the following information by filling in the blank or circling the appropriate answer.

1. What is your age in years? _____

2. What is your gender? *M* *F*

3. What is your relationship status? *Single* *Married* *Divorced* *Widowed*

4. What is your racial/ethnic heritage?

_____ White/Anglo or European American _____ Black/African American

_____ Asian, Asian American, Pacific Islander _____ Hispanic/Latino(a)

_____ Native American/American Indian _____ Arabic/Middle Eastern

_____ Bi-racial _____ _____ Other _____

5. How many days per week are you the primary person responsible for your child's/children's bedtime? _____

6. How many televisions do you have in your home? *0* *1* *2* *3* *4*

7. Please list the age and circle the gender of your children, and check (✓) if the child has access in their own bedroom to any of the entertainment devices listed.

Age _____ Gender *M F* TV _____ Cell Phone _____ Computer _____ Videogame _____

Age _____ Gender *M F* TV _____ Cell Phone _____ Computer _____ Videogame _____

Age _____ Gender *M F* TV _____ Cell Phone _____ Computer _____ Videogame _____

Age _____ Gender *M F* TV _____ Cell Phone _____ Computer _____ Videogame _____

Age _____ Gender *M F* TV _____ Cell Phone _____ Computer _____ Videogame _____

8. Does your child/children participate in any extracurricular activities? *Yes* *No*

9. If yes, do these activities ever interfere with your established family routines?

Yes, often. *Yes, sometimes.* *Yes, but not often.* *No, do not interfere.*

10. How often does your entire family have meals together?

Never *1x per week* *2-3x per week* *4-6x per week* *Everyday*

11. How often do you read to or with your child/children?

Never *1x per week* *2-3x per week* *4-6x per week* *Everyday*

APPENDIX D

INFORMATION REQUEST FORM

If you are interested in receiving more detailed information via email and/or attending an educational workshop about how to help your child get high quality and adequate quantity of sleep, please indicate your preference and provide an email address* below.

_____ I am interested in receiving more information by email.

_____ I am interested in attending an educational workshop to talk about sleep with other parents and the primary researcher.

_____ @ _____ . _____

*Email addresses will ONLY be used to communicate additional information on sleep or for contact regarding the workshop and will NOT be used for any other purpose or released to any other parties.

ADDRESSES WILL REMAIN CONFIDENTIAL AND BE DESTROYED AT THE END OF THE RESEARCH PROJECT

APPENDIX E

THE PARENTING SCALE

At one time or another, all children misbehave or do things that could be harmful, that are "wrong" or that parents don't like. Examples include:

hitting someone	whining	not picking up toys
forgetting homework	throwing food	refusing to go to bed
having a tantrum	lying	running into the street
arguing back	coming home late	

Parents have many different ways or styles of dealing with these types of problems. Below are items that describe some styles of parenting.

For each item, circle the number that best describes your style of parenting during the past two months with your child or children.

SAMPLE ITEM:
At meal time...

I let my child decide how much to eat. *1* (*2*) *3* *4* *5* *6* *7* I decide how much my child eats.

---

1. When my child misbehaves...

I do something right away. *1* *2* *3* *4* *5* *6* *7* I do something about it later.

2. Before I do something about a problem...

I give my child several reminders or warnings. *1* *2* *3* *4* *5* *6* *7* I use only one reminder or warning.

3. When I'm upset or under stress...

I am picky and on my child's back. *1* *2* *3* *4* *5* *6* *7* I am no more picky than usual.

4. When I tell my child not to do something...

I say very little. *1* *2* *3* *4* *5* *6* *7* I say a lot.

5. When my child pesters me...

I can ignore the pestering. — I can't ignore pestering.

1 2 3 4 5 6 7

6. When my child misbehaves...

I usually get into a long argument with my child. — I don't get into an argument.

1 2 3 4 5 6 7

7. I threaten to do things that...

I am sure I can carry out. — I know I won't actually do.

1 2 3 4 5 6 7

8. I am the kind of parent that...

set limits on what my child is allowed to do. — lets my child do whatever he/she wants.

1 2 3 4 5 6 7

9. When my child misbehaves...

I give my child a long lecture. — I keep my talks short and to the point.

1 2 3 4 5 6 7

10. When my child misbehaves...

I raise my voice or yell. — I speak to my child calmly.

1 2 3 4 5 6 7

11. If saying "No" doesn't work right away...

I take some other kind of action. — I keep talking and try to get through to my child.

1 2 3 4 5 6 7

12. When I want my child to stop doing something...

I firmly tell my child to stop. — I coax or beg my child to stop.

1 2 3 4 5 6 7

13. When my child is out of my sight...

I often don't know what my child is doing. — I always have a good idea of what my child is doing.

1 2 3 4 5 6 7

14. After there's been a problem with my child...

I often hold a grudge. — things get back to normal quickly.

1 2 3 4 5 6 7

15. When we're not at home...

I handle my child the way I do at home. — I let my child get away with a lot more.

1 2 3 4 5 6 7

16. When my child does something I don't like...

I do something about it. every time it happens. — I often let it go.

1 2 3 4 5 6 7

17. When there is a problem with my child...

things build up and I do things I don't mean to do. — things don't get out of hand.

1 2 3 4 5 6 7

18. When my child misbehaves, I spank, slap, grab, or hit my child...

never or rarely. — most of the time.

1 2 3 4 5 6 7

19. When my child doesn't do what I ask...

I often let it go or end up doing it myself. — I take some other action.

1 2 3 4 5 6 7

20. When I give a fair threat or warning...

I often don't carry it out. — I always do what I said.

1 2 3 4 5 6 7

21. If saying "No" doesn't work...

I take some other kind of action. — I offer my child something nice so he/she will behave.

1 2 3 4 5 6 7

22. When my child misbehaves...

I handle it without getting upset. — I get so frustrated or angry that my child can see I'm upset.

1 2 3 4 5 6 7

23. When my child misbehaves...

I make my child tell me why he/she did it. — I say "No" or take some other action.

1 2 3 4 5 6 7

24. If my child misbehaves and then acts sorry...

I handle the problem like I usually would. — I let it go that time.

1 2 3 4 5 6 7

25. When my child misbehaves...

I rarely use bad language or curse. — I almost always use bad language.

1 2 3 4 5 6 7

26. When I say my child can't do something...

I let my child do it anyway. — I stick to what I said.

1 2 3 4 5 6 7

27. When I have to handle a problem...

I tell my child I'm sorry about it. — I don't say I'm sorry.

1 2 3 4 5 6 7

28. When my child does something I don't like, I insult my child, say mean things, or call my child names...

never or rarely. — most of the time.

1 2 3 4 5 6 7

29. If my child talks back or complains when I handle a problem...

I ignore the complaining and stick to what I said. — I give my child a talk about not complaining.

1 2 3 4 5 6 7

30. If my child gets upset when I say "no"...

I back down and give in to my child. — I stick to what I said.

1 2 3 4 5 6 7

APPENDIX F

DESCRIPTIVE DATA

Table A

Hypothesis 2 and 3 Descriptive Data for Parenting Scale Overreactive Subscale "High" and "Low" Scores

	n	*M*	*SD*	Min	Max
OVR High	63	3.16	.516	2.60	5.00
OVR Low	47	2.07	.354	1.30	2.50

Table B

Hypothesis 4 and 5 Descriptive Data for Parenting Scale Lax Subscale "High" and "Low" Scores

	n	*M*	*SD*	Min	Max
LAX High	56	2.91	.510	2.36	4.36
LAX Low	55	1.82	.324	1.00	2.27