A New Measure Of Parental Self-efficacy For Enacting Healthy Lifestyles In Their Children

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A NEW MEASURE OF PARENTAL SELF-EFFICACY FOR ENACTING HEALTHY LIFESTYLES IN THEIR CHILDREN

by

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ABSTRACT

The issue of childhood obesity has become a pandemic of increasing prevalence and concern. Many behaviors contributing to overweight and obesity, such as dietary intake and physical activity, are learned in childhood. It is known that parents are key agents for change in their children. Therefore, interventions aimed at decreasing childhood overweight and obesity should be targeted at parents. Many parents state that they know the healthy dietary and physical activity behaviors they should adopt for their children, but lack the confidence, or self-efficacy, to enact these behaviors. A review of the literature for self-efficacy for behaviors in these domains in parents, adults and children uncovered many key elements involved. A search for an instrument to measure parental self-efficacy was unsuccessful in locating such an instrument, so several instruments in related domains were analyzed for content and utility for the generation of a new questionnaire. A 34-item questionnaire to measure parental self-efficacy for enacting healthy dietary and physical activity behaviors in their children 6-11 years old was developed and tested with a sample of 146 parents of children 6-11 years old, who could read and write English and had access to a computer with the internet. Internal reliability of the total scale was 0.94 and the two factors, dietary behaviors (DB) and physical activity behaviors (PAB) were 0.93 and 0.94, respectively. Test-retest reliability was also significant ($p<0.05$) for individual item responses and total and subscale scores in 25 participants after 5-10 days. Factor analysis resulted in two interpretable factors

(DB and PAB) which accounted for 25.3% and 16.8% of the variance, respectively. All items correlated more strongly with items on their respective subscales. Concurrent validity with theoretically similar scales was also demonstrated. This new measure was reliable and valid in this sample of parents of children 6-11 years old. Future use and further evaluation of this new measure is warranted.

I would like to dedicate this dissertation to my family, without whose support, understanding and love I could not have completed this journey.

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CHAPTER 1: INTRODUCTION

Background and Significance

Childhood Overweight and Obesity

The prevalence of childhood overweight [>85th percentile Body Mass Index (BMI) for age] and obesity (>95th percentile BMI for age)[1] in the United States (US) has reached epidemic proportions. Data, published in 2010, showed that over one-third of 6-11 year old children in 2008 were either overweight or obese, with nearly 20% being obese, a five-fold increase in obesity in that age-group since 1974.[2-6]

The consequences of obesity are far-reaching. Development of overweight and obesity in childhood predisposes children to future health risks, such as: cardiovascular disease, elevated insulin levels, dyslipidemias, sleep apnea, type 2 diabetes, joint or back problems, gallbladder disease, breast, colorectal, renal cell or endometrial cancers, and renal or hepatic disease.[7-14] For instance, it is estimated that one-third of all children born in the year 2000 eventually will be diagnosed with diabetes, many due to overweight and obesity.[15] In addition, after smoking, obesity is the leading cause of total mortality related to lifestyle issues in the US, translating to a loss of 5-20 years of life.[16, 17] Psychosocial consequences of obesity include: interpersonal problems, social isolation, discrimination, or rejection, and lowered self-esteem.[8, 9, 11, 18, 19] A seminal study of the social perception of children suggested that obese children were universally ranked less likeable than normal weight, physically disabled, or physically disfigured children.[20]

Similar findings to this study persist to this day throughout the world. Almost without exception, obese children are often found to be less sympathetic, less desirable as

a playmate, less active, less intelligent, and less attractive, when compared to normal weight or physically disabled children.[21-25] Financially, the sequelae for overweight and obesity are considerable, accounting for almost 10% of US national health care spending.[17] The most recent analysis of economic data states that this amounts to $78.5 billion in 1998, or $92.6 billion when adjusted for 2002 dollars.[26, 27] In children alone, obesity-related annual hospital costs more than tripled between 1979 and 1999, from $35 million to $127 million (most recent data available).[28]

Childhood is an important period for the prevention of overweight and obesity, as many dietary and physical activity behaviors are learned during this time and carry on into adulthood.[29] Failure to learn healthy lifestyle behaviors may lead to the development of overweight or obesity and future health problems.[11, 13, 30-33]

Parents as Agents of Change

It is known that parents play a key role in the learning and development of behavior patterns in children, acting as role models for their children and mediators of the family environment.[8, 10, 11, 34-43] Childhood obesity interventions designed to incorporate parents and families, versus children alone, have shown greater success in reducing child overweight measures.[44, 45] In fact, findings from several studies[34-38] suggest that treatment for childhood overweight and obesity shows statistically significant reduction in percentage of overweight children, post-intervention and up to one year later, only when parents are the sole focus of intervention, as the agents of change, versus parents/children or children-only interventions. Thus, it is apparent that parents should be targeted for the prevention of childhood obesity and the promotion of healthy dietary intake and physical activity in the home.[46]

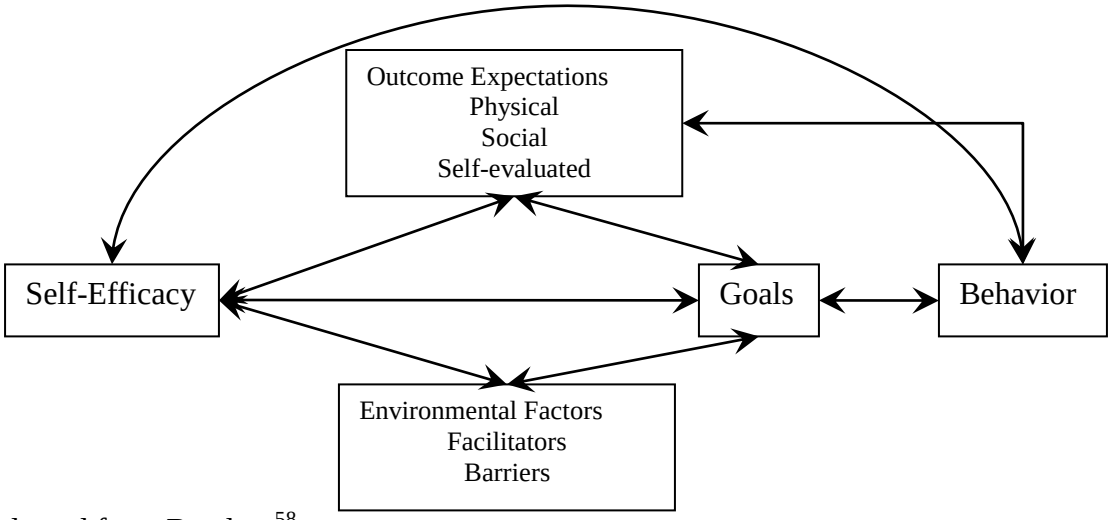
Parental behaviors have a direct impact upon the behaviors of their children[45], which may lead to adverse effects, such as overweight or obesity, smoking habits or substance abuse.[47-51] Children with obese parents have an increased risk for becoming obese themselves.[42, 52, 53] In fact, by age seven, children are more likely to be obese if one parent is obese, but have an odds ratio of 10.44 (5.11 to 21.32) if both parents are obese.[52] The lifetime risk for developing obesity in children with two obese parents is 80%, compared to 40% for only one obese parent and 7% if both parents are normal weight.[53] There also is a relationship between parents and their children for fatness, BMI, weight, cholesterol, and numerous other risk factors.[54] These associations may also have a link to the relationships noted between parent and child for dietary intake and physical activity.

Nevertheless, simply involving parents in childhood obesity interventions may not be effective. Interventions often focus on providing information and knowledge to the participants. However, it is known that many parents claim at least a rudimentary knowledge of healthy dietary and physical activity behaviors for their children. The problem, they propose, is they do not feel that they are always able to institute this knowledge into everyday behaviors.[45, 55] A plausible explanation for the chasm separating parental knowledge and behavior can be found in Bandura's self-efficacy theory.[56] Basically, parents lack self-efficacy, or confidence in their own ability, to engage in these healthy behaviors for their children. Thus, parental self-efficacy may be an important key assessment and teaching point in the battle against childhood overweight and obesity.

Theoretical Framework

The theoretical framework guiding the study is self-efficacy theory.[57] The basis of self-efficacy theory is drawn from social cognitive theory and the idea of triadic reciprocal determinism, or the interactive relationships between the major components of the model: the environment, the individual and behavior.[56] However, Bandura posited that behavior is based upon human agency, or the purposeful engagement in behaviors and there is a mediating factor leading to this purposeful engagement in behaviors, which he labeled self-efficacy.[56] Thus, self-efficacy, or one's belief in his/her ability to engage in a specific behavior or constellation of behaviors to reach a certain goal, mediates the reciprocity between the environment, individual and behaviors.[56] A person's belief in his/her capability to perform a behavior or constellation of behaviors to reach a goal is the driving force behind actual engagement in that behavior. It also reflects whether a person will engage in that behavior at all, and how long he/she will persist. Self-efficacy beliefs also influence (and are influenced by) the belief and actual capability to overcome barriers to performing the behavior; the outcome expectancies of performing said behavior; and the goals hoped to be achieved by performing the behavior, which is demonstrated in the model presented in Figure 1 (below).

Self-efficacy beliefs are themselves influenced by the interaction of several factors including: performance success or failure (mastery), witnessing others' success or failures, encouragement from others, and emotional or physiological arousal (i.e. depression or fear).[57]



Adapted from Bandura[58]

Figure 1: Theoretical Model of Self-efficacy

Performance success or failure can affect behavior in a positive or negative manner, respectively. If a person is repeatedly unsuccessful in performing a behavior, his/her confidence and desire to attempt a behavior in the future is reduced. However, repeated success can increase one's confidence and may encourage an individual to perform a behavior again and again, even if faced with occasional failures.

However, it has been noted by Bandura[57] that a person need not personally experience mastery of a behavior in order to feel an increased level of confidence in his or her own ability to perform a behavior. Seeing others perform a behavior provides encouragement that one can perform the same behavior with at least a modicum of success.[59] It has also been demonstrated that witnessing success at that behavior by multiple other individuals has an even stronger effect on increasing one's self-confidence in performing that behavior.[60]

Verbal persuasions, though less effective on their own, can act as a method to "boost" the effect of other interventions.[57] Given other means to increase confidence or

successfully perform a behavior, verbal persuasions may provide, at the least, a final impetus to attempt to perform a behavior. However, repeated failure to perform a behavior, despite verbal persuasion to the contrary, may lead to reduced confidence in one's ability to perform that behavior and reduced confidence in those who are encouraging the behavior.[57]

Finally, Bandura[57] posits that emotional state can affect one's confidence in performing a behavior, in either a positive or negative direction, depending upon the emotional state. However, previous experience with modeling or mastery of a behavior can alleviate negative or enhance positive emotional states.[59] Thus, similar to verbal persuasion, emotional state does not appear to be a primary actor upon self-efficacy, but may provide a temporary increase (or decrease) in one's confidence to perform a behavior.

Discussion

Conclusions drawn from the information provided here suggests that childhood overweight and obesity is a problem of great concern in the US. Additionally, it is apparent that parents should be a primary target for intervention to help curb this ever-increasing problem. As such, interventions should be aimed at providing parents with more than just the knowledge of healthy dietary and physical activity behaviors they should be providing their children. Parents need to be aided in understanding the means to engage their children in healthy dietary and physical activity behaviors and to increase their own self-efficacy for providing these behaviors. The purpose of this study addresses this issue through several approaches. To begin, a review of existing literature regarding parental self-efficacy for enacting these behaviors was conducted in order to

assist in the development of a new tool to assess parental self-efficacy. This review may also provide insight for the design of an effective intervention to increase parental self-efficacy in these domains. Additionally, a review of existing instruments for assessment of self-efficacy in similar domains was conducted. The final piece of this study was the development and testing of the psychometric properties of a questionnaire that assesses parental self-efficacy beliefs to engender a family ethos espousing healthy diet and physical activity for their children ages 6-11 years. This measure may assist investigators to better understand parental beliefs regarding their ability to create an environment which includes healthy diet and physical activity for their children. This will also enable future investigation of perceived parental barriers and outcome expectancies regarding the adoption of healthy diet and physical activity by a family. This new questionnaire subsequently could be used to assess change in parental self-efficacy for enacting these healthy behaviors for their children in order to assess the effect of an intervention. As parents are the primary agents of change for their children, a successful intervention to increase parental self-efficacy in this domain will add to the cadre of tools used in the fight to reduce the childhood obesity pandemic. Additionally, this questionnaire can be assessed for use with other demographic groups, such as parents of children with different ages or be translated for use in non-English speaking populations. Long-term implications for this instrument may include a shift in clinical education or practice and governmental policy regarding childhood obesity. Based upon results of this work, clinicians may adjust the approach to education regarding and assessment, treatment and prevention of childhood overweight and obesity. As the importance of parents and parental self-efficacy becomes clearer, clinicians and researchers will adjust time and

resources away from other areas that prove to be of less benefit, resulting in superior utilization of often limited time and resources. Finally, policy-makers at the local, state or federal levels (or even internationally) will be able to change existing policies and implement new ones that shift resources, programs and funding into parent-centered areas that result in improved outcomes and better value for the monies and resources used.

CHAPTER 2: PARENTAL SELF-EFFICACY FOR HEALTHY DIETARY AND PHYSICAL ACTIVITY BEHAVIORS IN THEIR CHILDREN: STATE OF THE SCIENCE

Childhood overweight and obesity are multi-faceted, worldwide problems.[61, 62] While many investigators have worked to create successful interventions to curb this pandemic, an important understudied dynamic is the role of parents as primary agents of change for their children.[34, 35, 37, 63] Thus, it appears that interventions to help with the problem of childhood overweight and obesity should focus upon parents in order to enact change in their children. Just involving parents in childhood obesity interventions may not be the best or only approach. Many parents already believe that they possess the knowledge of healthy dietary and physical activity behaviors, but feel the problem lies in their ability to translate that knowledge into actual behaviors.[45, 55] This disconnect between parental knowledge and behaviors may be better understood through the application of Bandura's self-efficacy theory.[56] Essentially, lack of parental self-efficacy, or their confidence in their own ability, to engage their children in healthy dietary intake and physical activity behaviors may be a key missing piece in the fight against childhood overweight and obesity.

The purpose of this review is to assess the state-of-the-science of parental self-efficacy regarding healthy dietary and physical activity behaviors in their children. However, as the research regarding parental self-efficacy for creating a family environment that espouses healthy dietary and physical activity behaviors is scarce, the existing literature about these domains in regards to self-efficacy, knowledge and behaviors for parents, adults and children is included. Due to this dearth of available

literature, studies performed within or outside the US are also included. Common outcome expectancies and environmental factors are also coalesced. The decision to include assessment of adults lies in the understanding that parental (or adult) behaviors may directly or indirectly impact their children's behaviors. Thus, evaluating adults for dietary and physical activity self-efficacy and knowledge may provide additional insight that is lacking in the parental literature, including any similarities or differences among parent, adult and child perceptions. Including results from child studies further reveals the effects of self-efficacy and knowledge on dietary and physical activity behaviors. All correlations reported are significant ($p<0.05$) unless otherwise noted.

Dietary Self-efficacy and Knowledge

Parents

No studies that examine the role of parental self-efficacy for implementing healthy dietary behaviors in their children were found. However, there have been studies of parental knowledge or behaviors and their association with their children's dietary behaviors.

Very few investigators have examined parental knowledge of dietary recommendations, such as those developed by the US Department of Agriculture (USDA),[64, 65] US Department of Health and Human Services[66] or the United Kingdom (UK) Department of Health,[67] and the relationship with their children's dietary behaviors. However, the results of some studies touch upon issues related to parental knowledge of these recommendations. In the UK, knowledge of recommended fruit and vegetable (F&V) intake among mothers with children ages 9-11 positively correlated with their

children's fruit, but not vegetable, intake.[68] In US mothers and their children, increased maternal knowledge of nutrition recommendations correlated with an increase in their children's healthy eating behaviors regarding total and saturated fat, cholesterol, fiber, sodium, calcium and iron.[69] A positive knowledge-behavior connection was also seen when both parents were evaluated for their knowledge about total and saturated fat intake recommendations. Increased parental knowledge was associated with lower total and saturated fat intake in their children.[70]

Robust associations between parental and child dietary behaviors suggested that parental intake of F&V positively influenced child F&V intake in elementary school aged children (ages 6-11)[68, 71-74] and adolescents (ages 12-18).[72, 73, 75, 76] A positive relationship for dairy intake between US parents and their adolescent children was also found.[75] In a more general exploration of healthy dietary behaviors, such as energy (kcal), carbohydrate, fat, protein and cholesterol intake, there were positive correlations between parental and child behaviors for US children ages 3-5[77] and 6-19,[78] Canadian children over 8 years of age,[79] and UK children ages 9-13.[80] Mothers in particular had a great influence on child intake as corresponding maternal intake was related to fat intake in Dutch older daughters (age ~25), [81] positively correlated with fruit intake in UK children ages 9-11[68] and showed more frequent and powerful significant interactions than father's overall intake of protein, carbohydrates, fats, cholesterol, sodium and calcium, in US children ages 3-5.[77]

Other positive links between parental influences on child dietary intake were also uncovered. Perceived parental support for consuming F&V and modeling parental F&V consumption behaviors significantly predicted F&V consumption in US middle school

students ages 12-16.[76] In English children ages 9-12, modeling of parental eating behaviors and attitudes provided an explanation of the children's eating behaviors and attitudes.[80] When the role of shared, or family, meals with the family's primary food preparer [(FFP), most often (84%) an adult female] was evaluated, children's (ages 5-12) F&V intake increased as the number of shared meals increased. In the same study, adolescent's (ages 13-17) intake of F&V significantly interacted with the number of shared meals with the FFP, specifically up to two shared meals.[72] Again, this appeared to be an interaction effect of both parental (FFP) control of what is being eaten and the children's modeling of what the parents are eating. These data support the belief that parental knowledge and actual behaviors have a direct impact on their children's dietary intake and eating behaviors.

Adults

Self-efficacy for healthy dietary intake has been examined quite often in adults. Again, F&V intake was a common variable, and higher levels of self-efficacy correlated in a positive direction with increased intake of F&V in adults.[82-86] This correlation held regardless of age[83] or gender.[84] When interventions to increase F&V intake were instituted with young adults (ages 18-24)[83] and a sample of mostly black women under 30 years of age,[84] the investigators saw corresponding increases in self-efficacy for F&V intake. When a more broad definition of healthy dietary intake than only F&V intake such as lower fat intake and/or increased fiber intake, was used in various samples of adults, a positive correlation between dietary self-efficacy and healthy eating was found.[87-90]

Self-efficacy may be a mediating link between knowledge and behaviors, but not all studies used social cognitive theory as a framework. Correlations between knowledge of dietary recommendations and healthy dietary behaviors were often positive, and greater knowledge of the recommended five or more daily F&V servings corresponded with increased F&V intake in adults.[84, 86, 91, 92] Low dietary fat intake, another component of healthy eating behavior, was inconsistent among studies. Some investigators saw a positive correlation between knowledge of low dietary fat intake and actual intake[88, 93]. Others found no apparent relationship between dietary fat intake and knowing dietary fat intake recommendations. This discrepancy possibly was due to such factors as the methods used to evaluate knowledge or participants' difficulties in making effective food substitutions that would result in lower fat intake.[94-96] In contrast, a positive relationship between knowledge of daily serving recommendations and dietary intake were consistent for fiber[97], fruit, dairy, protein and whole grains.[98] Investigation of more complete knowledge of daily dietary intake recommendations, including all five major food groups and salt and fat intake, revealed a positive connection between knowledge of these recommendations and actual dietary intake behaviors in adults.[98-103]

Children

Studies conducted with children regarding dietary intake have found similar results as those for adults. As found in adults, higher levels of self-efficacy for F&V intake positively correlated with actual F&V intake in 4th grade[104] and 10-12 year old US[105] and 7-10 year old Mexican[106] children and US adolescents, ages 12-16.[76] However, a conflicting study showed no correlation between self-efficacy for F&V intake and actual F&V intake in US children ages 7-11.[107] These contradictory findings may be

explained by measurement error, such as non-standardization of portion sizes on food diaries, weak discriminant validity of the measure for self-efficacy, or a lack of items to measure key factors of self-efficacy for consumption of F&V.

Examination of other components of dietary intake found mostly positive associations were between self-efficacy and actual intake. An investigation of self-efficacy to consume vegetables and the actual intake in European boys ages 9-14 showed a positive correlation.[108] Assessment of general healthy dietary intake behaviors, such as eating a low-fat or low-sodium diet suggested self-efficacy positively correlated with behaviors in US 3rd, 4th, 5th and 7th graders,[109-112] and Australian 11th graders.[113]

However, in samples of 12-16 year old US students[114] and 11-15 year-old Flemish girls,[115] there was no apparent influence of self-efficacy to eat a low-fat diet and actual dietary fat intake. This finding may be a result of the self-efficacy measurement tool used or the cognitive development of adolescents, such that their self-efficacy for restricting dietary fat intake may not be able to fully overcome general adolescent inability to restrain behavior, delay gratification, or immediately contemplate long-term consequences of their actions. A surprising finding relating higher levels of self-efficacy to consume a healthy, low fat diet to higher BMI in 6-18 year old children and adolescents was uncovered in a large, national study in Australia.[116] Path analysis in this study further revealed that dietary self-efficacy was a mediating factor for the impact of increasing food variety intake on increasing BMI. These findings suggested that those children who ate a wider variety of food had a greater dietary self-efficacy. The authors believed that this led to higher BMI. However, eating a wide variety of foods, including healthy or low-fat foods, could be considered a form of performance success. This

behavior should, according to self-efficacy theory, contribute to an increase in dietary self-efficacy. In this case it raises the question of whether dietary self-efficacy, mediating the effects of greater food variety on increasing BMI, actually served to minimize the effects. Further analysis of BMI in participants with high food variety comparing those with high versus low dietary self self-efficacy is warranted to further explain this dynamic.

In US children, healthy dietary knowledge, such as eating a low-fat, low-sodium diet was positively linked with corresponding healthy eating behavior in both sexes at 8-9 years old.[109] Similarly, knowledge of general nutritional intake recommendations, in US girls ages 11-12 and boys ages 12-13, was associated with actual healthy eating behaviors.[117] Knowledge of recommendations for vegetable intake and actual intake in European boys, ages 9-14, was also positively correlated.[108] Increasing knowledge of healthy eating, however, did not show an association with the BMI of Australian children and asolescents.[116]

Physical Activity Self-efficacy and Knowledge

Parents

In searching the literature, studies were scarce for parental self-efficacy for enacting physical activity or exercise behaviors in their children, just as in dietary intake. Studies focusing upon parental knowledge of physical activity recommendations and corresponding child physical activity were not found. Numerous investigators who conducted studies of parent-child correlates of the child's actual physical activity and parental behaviors, such as being physically active, encouraging activity, or providing

support, generally suggested that increasing levels of these physical activity behaviors of a parent positively corresponded to increased levels of actual physical activity in their children.[118-131] These findings suggest a possible effect of modeling behaviors or verbal persuasions from the parents. On the other hand, in one study of 9-year-old children, Sallis and colleagues[132] found no correlation between parental physical activity and that of their children.

Exploring the effect of the parent's gender, several studies showed that the physical activity habits of the father positively correlated more strongly with their children's physical activity[118, 125, 130], although one study showed the correlation between mothers and 10-12 year old daughters' physical activity was stronger.[119] In a study of 4-7 year olds, the greatest predictor of child physical activity was when both parents were physically active, versus neither or only one, suggesting that having multiple opportunities for the children to model behaviors had a greater influence upon their physical activity.[125] This positive modeling effect may help explain the apparent associations found between parental and child physical activity for younger,[120] older,[119, 123-128, 130, 131] and adolescent children,[118, 121-123, 129-131] though replication of this study in different samples should be conducted to draw any further conclusions.

Other facilitative parental behaviors, such as: transportation of, engagement with, or encouragement of their children, were shown to positively relate to the actual physical activity engaged in by their children. Parental facilitation was found to positively correlate with the physical activity of US children.[127, 132, 133] Encouragement by parents, perhaps a form of verbal persuasion, positively correlated with the physical activity of their children in studies among US children[122, 127] and adolescents in the US[118] and UK.[134]

Adults

Investigation of the connection between self-efficacy to engage in physical activity and actual physical activity has been studied broadly in the adult population. Every study reviewed showed a positive relationship between self-efficacy and actual physical activity, across all ages (18-99) and gender.[90, 135-163]

Only a single study of adult awareness and knowledge of physical activity recommendations or guidelines was located. It suggested that, in US adults, 94% of the participants were aware of traditional physical activity behaviors and that 68% were aware of specific physical activity guidelines. Yet, the knowledge of physical activity did not correlate with actual physical activity behaviors in this sample.[164] This finding supports the notion of an important factor, such as self-efficacy, which may explain the discord between knowledge of a healthy behavior recommendation and actually engaging in those behaviors.

Children

As with adults, investigation into the relationship between self-efficacy for physical activity and actual behaviors is widespread. It should be noted that no study assessed self-efficacy for physical activity in children under the age of eight. Similar to adults, findings suggested that self-efficacy for engaging in physical activity positively associated with actual physical activity behaviors in children and adolescents of all ages (8-18 years).[105, 112, 119, 122, 165-185] In two interventional studies designed to increase self-efficacy for physical activity in US adolescents, investigators saw corresponding increases in actual physical activity[173] and improvements in cardiovascular fitness.[186] Two studies noted lower self-efficacy for physical activity in overweight versus normal-

weight US children.[187, 188] One possible explanation for this finding could be a decrease in self-efficacy as a result of past performance failures, leading to decreased participation in physical activity and resulting in increasing risk (and realization) of becoming overweight.

Knowledge of physical activity and recommendations or guidelines has only been studied sparingly among adolescents. Study findings conflicted, however, as a positive correlation between knowledge of physical activity recommendations and actual behavior was found in US 8th and 9th graders.[122] However, it should be noted that when the positive correlation was found, there was also a corresponding positive correlation with self-efficacy for physical activity. In another study of US 6-8th grade students, no association between knowledge of physical activity and actual physical activity was observed.[189] It should be noted that in this study, perceived benefits (or outcome expectancies), perceived athletic ability and belief in one's ability to persevere acted as predictors of current actual physical activity. Another study of adolescents in the UK showed a positive correlation between knowledge of the health benefits of physical activity and actual behavior, though stronger correlations were seen for encouragement from adults and their own perceived competence.[134] Another study showed a significant correspondence between heart-health knowledge, which included knowledge of physical activity recommendations, and actual physical activity behaviors in US adolescents.[121] However, in the same study, there was also a positive association between parental physical activity and the adolescents' actual physical activity levels.

Outcome Expectations

Outcome expectancies are the judgments that one makes of the likely consequences of performing behaviors, and may also be considered the benefits or drawbacks. Understanding the expectations of healthy dietary and physical activity behaviors is important. Doing so will facilitate the understanding of what parents, adults and children expect to achieve by embracing these healthy lifestyle behaviors. These expectations, according to self-efficacy theory, fall within three domains, physical, social and self-evaluative.[56]

Physical

Only a single study of parental views of the benefits of healthy dietary intake for their children was found. The authors suggested that British parents of children ages 7-12 believed healthy dietary intake resulted in mostly "short-term" health benefits, such as healthy hair, skin and teeth, as opposed to long-term consequences, such as cancer or heart disease. The parents also thought healthy dietary intake would result in better weight control and better behavior or mood in their children.[55] Although studies conducted in the US regarding adult beliefs in the physical effects of healthy dietary behaviors were not found, European studies suggested adults believed such that healthy dietary intake would: lower or control their weight, improve or maintain health, prevent disease, improve or maintain fitness, and/or taste good.[190-193] In US adolescents and Australian children, the expected physical benefits were paramount and similar to those found in English parents and European adults: lose or maintain weight and improve or maintain health.[45, 194]

Again, only a single study was found that explored parental expectancies of the benefits of their children engaging in physical activity. In this study, English parents expressed the belief that their children's (ages 7-12) engagement in physical activity resulted in: weight loss or maintenance, improved behavior and mood, and a break from daily school work.[55] In Australian adults and adult Canadian women, outcome expectations of their participation in physical activity included: weight loss or maintenance, health improvement or maintenance, and improved sleep.[162, 195] Studies conducted with children and adolescents found that the perceived benefits of their engagement in physical activity included: weight loss or maintenance, improved strength, fat loss, improved fitness, health maintenance or improvement, and increased energy.[45, 196, 197]

Social

Few studies of the perceived social outcomes of engaging in healthy dietary and physical activity behaviors were found. However: UK parents suggested that their family would enjoy eating the healthy foods[192], Dutch adults believed that others would enjoy the healthy foods when cooking for them[191], and US adolescents thought their parents and others (i.e. teachers or peers) would look favorably upon their healthy eating.[194] Parents in the UK thought that participation in physical activity, especially organized sports, would improve the social skills of their children ages 7-12.[55] Canadian adolescents also believed in a socialization benefit of physical activity participation.[197] Adult Canadian women viewed physical activity as a means to be with friends and to get out of the house.[162]

Self-evaluated

Self-evaluation does not appear often in the literature, especially for parents. European adults believed eating healthy would lead to: feeling more attractive, feeling better mentally, and improving quality of life.[190, 191, 193] Australian and Canadian adults reported the perceived outcomes of participating in physical activity as: improving self-esteem and confidence, feeling better about appearance, challenging themselves, looking better in their clothes, feeling a sense of accomplishment, improving relaxation and energy, decreasing stress, enjoying activity and doing something for themselves.[162, 195] Adolescents in Canada and China suggested that they expected enjoyment of physical activity, feeling challenged, improved skills, and relaxation.[196, 197]

Environmental Factors

Environmental factors, whether actual or perceived, exist in a person's milieu for performing certain behaviors. These factors may serve to aid or encourage behavior (facilitators) or present obstacles to behavior (barriers). Understanding the environmental factors that may contribute to or prevent the adoption of healthy dietary and physical activity behaviors is important.

Facilitators

Although the facilitators for healthy dietary intake or physical activity have been described as difficult to verbalize[55], they have appeared in some studies. In the US, parents have suggested that schools and education (for the parent or child) may help to increase healthy eating. Additionally, parents believed they must support their children's healthy eating and be good role-models by eating healthy themselves.[198] Scottish adults

also appeared to desire education, as well as support and specific behavioral strategy ideas from healthcare professionals. A fear of adverse health consequences was another facilitator of healthy eating in this group.[199] US adolescents saw support from others, especially their parents, as important, to their being able to eat healthy foods.[194]

For physical activity, Australian parents suggested that schools and the availability of parks or playgrounds in the neighborhood acted as facilitators for increasing their children's physical activity levels.[45] Australian adults found that internal factors, such as guilt over not being physically active or concerns about their future health, and support from other individuals, such as joining in activity or providing verbal support, served as facilitators for their being physically active.[195] In a study of Chinese adolescents, [196] several facilitators for adolescent engagement in physical activity were reported. First, there were items related to time, such as fewer homework assignments, increased free time, or being on vacation from school. Physical environmental factors, such as good weather and actual facilities (i.e. gyms, playgrounds or parks), and psychological factors, including the enjoyment of physical activity and simply being in a good mood, all acted as facilitators. Finally, the adolescents found rewards, such as prizes or the approval of teachers and parents, to be facilitators.

Barriers

The investigation of barriers to engaging in healthy dietary intake and physical activity behaviors appeared often in the literature. When trying to implement healthy eating behaviors in their children or provide healthy meals, parents expressed that lack of time and cost were two of the greatest barriers.[45, 55, 198, 200-202] In addition to these two barriers, parents felt they were under the control of their child's behavior with their

demands for foods, pressures to buy or prepare certain foods, and their child's preferences or resistance to change.[45, 55, 198, 200, 202] Moreover, parents saw peer pressure on their children as a barrier to healthy eating.[45, 55] The actual availability of "healthy" foods, especially F&V, due to access or seasonal fluctuations, acted as a barrier to their children's healthy eating to some parents,[198, 201] as did the food environment in many schools.[45, 55] Another common barrier parents cited to their children's healthy eating was the result of marketing and health messages. The actual advertising and marketing of unhealthy foods, especially when aimed directly at children, provided a difficult barrier. Also, marketing, advertising and changing "official" health messages provided inconsistent or contradictory messages regarding healthy eating, in the opinion of parents.[45, 201] Lack of knowledge or incorrect health beliefs about eating (i.e. the child will grow out of it or fear of causing eating disorders) were barriers experienced by many parents.[55, 198, 203] Finally, some parents also realized their parenting and actual eating behaviors, as a role-model, were barriers to healthy dietary behaviors in their children.[55, 198]

The barriers to healthy eating in adults appeared to be very similar to those of parents, with additional individual barriers. Again, time and cost were widely expressed as barriers to being able to eat healthy.[190-193, 199, 204, 205] Similar to the barrier of "child preference", many adults stated that taste offered a considerable barrier to their healthy eating.[190-193, 204, 206] Many adults also feel they lacked knowledge of healthy eating recommendations or how to prepare healthy foods or that healthy foods, such as fresh F&V, were not readily available, either seasonally or in their markets.[191, 193, 199, 204, 205] Interestingly, some also felt a lack of satiety or satisfaction from eating healthier foods,

such as F&V.[192, 206] Psychological factors, such as cravings for less- or un-healthy foods, perceived lack of self-control or existing poor eating habits, provided hefty obstacles.[190, 191, 193, 199] Finally, the lack of support for or the unhealthy eating behavior of others made healthy eating difficult for many adults.[191, 193]

In children, most research found has been conducted with adolescents, and many of the same barriers arose. First, time appeared as the most substantial barrier to healthy eating, whether due to: time needed to prepare healthy foods, time available to eat meals at school, time saved due to convenience of fast or junk foods, or lack of parental time to prepare healthy meals for them.[194, 207-209] Just as in adults, taste, either due to dislike of healthy foods or preference for unhealthy foods, arose as a considerable barrier to healthy eating.[45, 194, 208-210] Just as parents feared, peer pressure to eat certain foods influenced dietary decisions.[194, 207, 210] Availability of healthy foods, in the home, school or community (i.e. restaurants), was also cited as a barrier to being able to eat healthy.[194, 207] Finally, a lack of concern about the consequences of poor dietary intake, confusion about health messages regarding dietary recommendations and the influence of advertising imparted barriers.[45, 208, 210]

Barriers to physical activity are also well-documented. Parents, just as with healthy dietary intake, saw time (i.e. work responsibilities, school or transportation) and cost as important barriers to their children's physical activity participation.[45, 55, 201, 202] Major barriers also included safety, either the environment where children may be physically active or the possibility of injury to the child, and the lack of availability of facilities, such as gyms, parks or playgrounds.[45, 55, 201] Similar to healthy eating, parents felt they were under the control of their child's behavior with their preference for

sedentary behaviors, resistance to change, demands to avoid physical activity, or desire for technology (i.e. television or video games) instead of physical activity.[45, 55, 202] Parents also believed that their child's peers negatively influenced their children's activity.[45, 55] Inaccurate health beliefs and contradictory health messages regarding their child's physical activity, just as with diet, provided barriers to parents getting their children physically active.[45, 55] Bad weather and their own poor levels of physical activity, as role-models, were also cited by parents as barriers.[55]

For adults in general, time and safety, due to the physical environment for physical activity or risk of personal injury, were frequently cited barriers to participating in physical activity.[195, 211-214] Psychological factors, such as being self-conscious of one's body and lack of motivation, also prevented adults from being more active.[195, 211-213] Lack of energy, feeling too tired before or after activity, concerns over one's health and ability to perform activity prevented many adults from being physically active.[195, 211, 213, 214] As stated by parents, a lack of facilities, such as gyms or walking paths, made engaging in physical activity difficult for many,[211-214] as did bad weather,[195, 212, 214] cost to participate[211] and lack of an exercise or activity partner.[214]

Children described many of the same barriers to physical activity as adults, although most studies found examined only adolescents. Time, again, was frequently mentioned as a barrier to physical activity, due to: schoolwork, family commitments, other interests or hobbies, technology (i.e. television or video games) or jobs.[196, 197, 215, 216] Just as parents and adults stated, lack of facilities and safety (environment or injury risk) were detriments to physical activity among children.[45, 196, 216] As was the case for dietary behaviors, peers offered an obstacle to physical activity, through: disapproval, desire to

do other activities, or not providing an activity partner.[196, 197, 216] Psychological issues, such as: poor mood, self-consciousness of body image, stress, lack of self-discipline, dislike of competition, lack of willingness, or viewing activity as not fun or too hard,[196, 197, 215, 216] lack of energy or health concerns,[196, 197, 215] cost of participation[45, 216] and bad weather[196] provided numerous barriers to being physically active, as well.

Conclusions

There are many similarities in studies of parents, adults, and children in the various facets of self-efficacy for healthy dietary intake or physical activity. Self-efficacy for these behaviors often are a key component of an individual engaging in these behaviors, consistent with the major tenet of self-efficacy theory. In addition, it also appears that role-modeling of parental behaviors, whether for dietary intake or participation in physical activity, plays an important role in the actual engagement in similar behaviors in children. Also, the inconsistent results of studies examining the connection between knowledge, such as healthy diet or physical activity recommendations, support the notion of an important mediator (self-efficacy) between knowledge and actual behavior. Thus, it can be deduced that parental self-efficacy for engaging their children in healthy dietary and physical activity behaviors would demonstrate similar results.

As an extension, researchers have demonstrated that the concerns of adults and children regarding healthy diet and physical activity behaviors are quite similar. Thus, important mediating factors for parental self-efficacy to instill these healthy behaviors in their children may be similar in nature. The results of this literature review are anticipated to assist in the assessment of existing instruments to measure self-efficacy

regarding these behaviors. Information presented also may assist in the design of an instrument for assessing parental self-efficacy for enacting these behaviors in their children and of future interventions to increase parental self-efficacy within this domain.

CHAPTER 3: MEASUREMENT OF SELF-EFFICACY: HEALTHY DIETARY, PHYSICAL ACTIVITY AND PARENTING BEHAVIORS

Background

The prevalence of childhood obesity has reached pandemic proportions. This has enormous implications for the health and finances of individuals and nations that are affected.[4, 6, 7, 9, 10, 12-14, 217-220] A difficulty researchers face is figuring out what are the causes of this trend and how they work and interact to cause obesity. As researchers continue to investigate these causes, one factor that is emerging as particularly important is the place of parents in the lives of children. Parents are primary agents of change and role-models for their children[34-38, 45, 221] and future interventions need to target parents in order to effect behavior change in their children related to increasing physical activity, decreasing sedentary behaviors, and improving dietary intake.

However, based upon self-efficacy theory, a person must have belief in his/her ability to perform a behavior in order to have a positive outcome and overcome barriers that may arise.[56, 222] Thus, parents must possess the self-efficacy, or belief in their ability, to engage their children in these behaviors. As such, it will be important to be able to assess the parental self-efficacy in these domains. The ability to do so will assist in gauging the amount and areas of necessary intervention needed, as well as the effectiveness of these interventions.

The purpose of this study was to assess the existing instruments for assessing parental self-efficacy for enacting healthy dietary and physical activity behaviors in their children. A literature search in databases such as PubMed, CINAHL and MedLine for key terms such as parent, self-efficacy, children, diet and physical activity resulted in no

findings. Due to the paucity of studies and minimal information available on this very specific domain, a thorough examination of the state of the science in this area was not possible. However, the minimal amount of work regarding parental self-efficacy as it pertains to diet and physical activity, does not preclude the possibility for and importance of evaluation. Instead of focusing directly on a single approach to the measurement of this important phenomenon, a more broadly-based state of measurement of various components in this area was conducted. The findings are expected to assist in the development of a reliable and valid measure of parental self-efficacy for enacting healthy dietary and physical activity behaviors in their children.

Results of the initial search were examined for all instruments that fell into these domains. Many of the components falling under the umbrella of parental self-efficacy for enacting healthy diet and physical activity behaviors were found to have associated measurement tools. However, all measures discovered focused upon assessing a person's self-efficacy beliefs for engaging in a behavior him/her self. None of these measures assessed a person's self-efficacy for engaging another person in a behavior. Additionally, each of the measures focused only on a single domain, such as eating behaviors or dietary intake (fruits and vegetables and dietary fat), exercise or physical activity, health behaviors for the self, and parenting, rather than on a constellation of healthy eating and physical activity behaviors. Although the measures evaluated in this review are not useful for assessment in the desired domain of parental self-efficacy for enacting healthy diet and physical activity behaviors in their children, they certainly have utility to assist in the development of such a measure. It is reasonable to believe that the first step in

understanding the self-efficacy of a person to enact a behavior in another person would be similar to the self-efficacy to engage in the same behavior oneself.

From the literature gathered, several tables were developed to organize information generated by review of the articles. Information gathered from the articles included: measure name (if applicable) or description, target population, scaling, reliability, validity, examples of use in research. Table 1 (Appendix A) presents several self-report questionnaires, their psychometric articles, examples and the purpose of research using the scales when available.

A total of 17 individual questionnaires were found. These included: five self-efficacy for fruit and vegetable intake (F&V) scales, three full scales[223-225] and two subscales;[226, 227] the Self-efficacy for Eating Behaviors Scale,[228] measuring numerous eating behaviors such as reducing calories, fat or salt intake; two questionnaires of self-efficacy for exercise or physical activity;[228, 229] the Self-Rated Abilities for Health Practices (SRAHP) questionnaire, encompassing self-efficacy for a range of health practices;[230] and eight questionnaires all related to parenting self-efficacy, including the self-efficacy subscales of the Parenting Sense of Competence (PSOC-E),[231, 232] Parental Locus of Control (PLOC-E),[233] the Control-of-Outcome & Self-efficacy Scales for Women in Four Life Roles,[234] and the Scale of Parental Involvement and Self-Efficacy (SPISE),[235] one parenting self-efficacy scale developed for use with parents in the UK,[236] two scales specifically for use with mothers, the Toddler Care Questionnaire (TCQ)[237] and the Maternal Self-efficacy scale,[238] and a scale of Mastery, which includes a subscale involving the parenting role.[239] After additional consideration, further review of some scales was not conducted since they were not as reflective of the purpose of the literature

review. Three of the fruit and vegetable intake scales[224, 225, 227] and two of the parenting self-efficacy subscales were excluded due to weakness in the quantity and strength of their psychometric properties, particularly in relation to the other scales that were available for review.[234, 235] The tools to measure parenting self-efficacy in the United Kingdom[236] and maternal self-efficacy[238] also were excluded, due to a difference in the target population of parents of both genders in the United States. Additionally, the Mastery in the Parenting Role[239] subscale was excluded since Mastery is not as closely aligned with self-efficacy as the other scales available and therefore of less utility for the purposes of this review. The questionnaires most relevant to the purpose of this literature review are described in further detail.

Measures of Eating and Dietary Behaviors

The Self-efficacy and Consumption of Fruit and Vegetables scale[223] was created under the self-efficacy tenet of the transtheoretical or stages of change model. Its purpose is to assess self-efficacy for increasing F&V consumption, discriminating between individuals at different stages of readiness to change their F&V consumption behavior. The scale consists of 20 items measured on a 5-point Likert-type scale, ranging from 1 (totally confident) to 5 (not at all confident). Individuals rate their confidence in their ability to include eating F&V in various difficult circumstances.

Development of items began with focus group discussions consisting of 19 total participants in 3 focus groups. Topics for the focus group discussions were developed from previous self-efficacy scales for healthy eating, fat reduction and F&V consumption. Analysis of data from the three focus groups resulted in the generation of 21 items to measure confidence for F&V consumption in sample instances across various

levels of situational difficulty. These initial 21 items were pilot tested with 30 participants, including tertiary (college or university) students, nurses, clerks and housewives. They were asked to assess the clarity, relevance, and comprehension of items. Developers removed one item based upon results from this pilot test. The 20-item scale was then reviewed by two nutrition researchers to ensure theoretical consistency and coverage of a range of situational difficulties.

Final scale development and validation used a random sample of 716 Chinese Singaporeans. Responses from half of this sample were used for exploration, with responses from the other half used for confirmation of the scale. Principal component factor analysis conducted on responses from the exploratory sample resulted in 16 items with acceptable factor loadings (≥0.40) and no overlapping onto the two factors, "difficult situations" (11 items) and "being able to remember" (5 items). These two components accounted for 54% of the total variance.

Confirmatory factor analysis conducted on the other half of the sample corroborated the two-factor structure, with items primarily associating with one of the two factors with a loading >0.60. Seeking subscales of approximately equal length, the developers removed 4 items with similar factor loadings from the "difficult situations" subscale. After scale refinement, factor loadings for the "difficult situations" component ranged from 0.59 to 0.86 and accounted for 47% of the variance in the items. The five items on the "being able to remember" component had factor loadings from 0.61 to 0.85 and accounted for 11% of variance in the items. Internal consistencies of the two subscales (Cronbach's alpha) were 0.89 and 0.77, respectively.

There was a high correlation between the two subscales (0.59), which the authors posited revealed a consistent and overall measure of self-efficacy for increasing F&V consumption. Structural equation modeling conducted when the questionnaire was developed supported this with significant factor loadings of the scale items from 0.58 to 0.83. Analysis for overall main effect of this scale against the stages of change results for the participants was found, with similar results when controlling for age and gender.

This scale is potentially useful, as it demonstrated a factor structure that remained very stable across samples and gender, with good reliability. Additionally, it discriminated among individuals at different levels of readiness to consume F&V. However, it assesses the self-efficacy of the individual for increasing his/her own F&V intake, not in increasing the F&V intake of another. Additionally, it only covers the realm of F&V intake, ignoring other facets of dietary intake. Finally, this scale was developed for, and its psychometric properties tested with, Chinese Singaporeans. Unfortunately, without further psychometric testing in a sample of individuals in the US, these properties cannot be generalized to this sample. Thus, this scale may be of utility as a guide for generation of items specific to F&V intake, with care taken to consider cultural context. However, it does not aid in other dietary behaviors and is not helpful to assess self-efficacy beliefs for enacting these behaviors in another individual.

The Self-efficacy for Increased Fruit and Vegetable Intake[226] scale was developed to determine the benefits, barriers, methods for changing intake, and self-efficacy for the increase in consumption of F&V by low-income, African-American mothers. It includes information on decisional balance, processes of change and self-efficacy. The self-efficacy subscale consists of nine items rated on a 5-point Likert-type scale ranging from

1 (not at all sure) to 5 (extremely sure). Participants rate their "confidence in the ability to perform behaviors that enabled fruit and vegetable intake in difficult situations, such as when in a rush, tired, or away from home, and in eating situations, such as lunch or dinner."[226, p. 842]

The self-efficacy subscale was developed by incorporating important issues that emerged during a "think-aloud" method[226] from a previous study in a similar sample, based upon the transtheoretical model. Pilot testing with individuals from the target sample used cognitive interviewing with 10 women to assess clarity, understanding, response strategies, and format of the survey. After editing the survey, another pilot test on 30 women from the target sample was conducted to re-assess internal consistency and validity, which were deemed adequate.

The study sample for testing psychometric properties consisted of 420 women. Principal component factor analysis revealed that the self-efficacy factor explained 56% of the variance of the items. Factor loadings of the individual items on the self-efficacy subscale ranged from 0.71 to 0.82. Cronbach's alpha for internal consistency was 0.90. Spearman correlation analysis of each item score with the total scale scores showed item-scale correlations ranging from 0.71 to 0.81.

Overall, this scale has potential use to aid in the development specific F&V items for another more comprehensive scale. The internal reliability as well as content and construct validity all point to the strength of this scale's development. However, again, this scale only focuses on F&V intake, ignoring other important dietary intake behaviors, such as dairy, meats or poultry, fat, and sugar intakes. In addition, it focuses on one's own F&V intake self-efficacy, not for getting others to eat F&V. Finally, the narrow

sample for which the scale was developed and upon which it was tested limits its use for a more general US population.

The Self-efficacy for Eating Behaviors[228] instrument measures self-efficacy for health-related diet behaviors, such as reducing calories and eating a low-salt, low-fat diet, in specific situations. The instrument consists of 61 items measured on a 5-point Likert-type scale from 1 (I'm sure I can't) to 5 (I'm sure I can). Participants rate their confidence in their ability to motivate themselves to perform a behavior consistently. Self-efficacy is measured for resisting relapse (18 items), reducing calories (15 items), reducing salt (9 items), reducing fat (10 items) and behavioral skills (9 items).

Initial scale development relied upon a study of 40 participants who: were ≤45 years old, had a child 8-16 years in the home, and were currently attempting to change their diet and/or exercise behavior. Individual structured interviews were conducted to determine behaviors that led to eating a low-sodium, low-fat diet in this sample. Experienced investigators then selected the final items and wording for the scale, which consisted of 89 items.

Psychometric testing of this scale was carried out with 171 participants, including introductory psychology students, undergraduate health psychology students, and staff members of a health-promotion study. Principal component factor analysis with varimax rotation revealed 61 items with adequate loading. They loaded upon five factors which explained 44.1% of the variance, all with eigenvalues >2.0. The individual factors (percentage of variance) were: (1) resisting relapse (26.3%), (2) reducing calories (7.0%), (3) reducing salt (4.0%), (4) reducing fat (3.8%) and (5) behavioral skills (3.0%). Factor loadings for the individual items within each factor ranged from 0.41 to 0.75.

Cronbach's alpha for internal consistency were calculated from the original sample and by test-retest after 1-2 weeks in a subsample of 52 participants. The alpha coefficients ranged from 0.85 to 0.93, for the initial, and 0.43 to 0.64, for the test-retest samples. The intercorrelations of factors within the scale ranged from 0.35 - 0.69, suggesting moderate factor overlap.

The investigators stated that construct- and criterion-related were evaluated through the use of other scales. First, participants completed a food frequency questionnaire which was then categorized by a registered dietician and converted into a "not heart healthy/heart healthy" dietary index. As expected, all five factors significantly correlated with scores on this dietary index from -0.43 to -0.24. The investigators also asked participants to complete the Multidimensional Health Locus of Control (MHLC) scale, with subscales measuring one's belief of: direct responsibility (Internal), chance, and influence of others (External) on health. The MHLC Internal subscale correlated significantly (P<0.001) and moderately strong (0.32 to 0.40) for all the self-efficacy subscales. The MHLC Chance subscales associated in a negative direction with the self-efficacy subscales and only significantly with the resisting relapse (-0.20, P<0.05), reducing fat and behavioral skills (both -0.15, P<0.05) subscales. The MHLC External subscale also negatively associated with the self-efficacy subscales and significantly only with the reducing fat (-0.15, P<0.05) subscale.

This scale was developed using sound theoretical and methodological techniques. The factor analysis yielded meaningful and decipherable factors, which also related to concepts theoretically essential for health-related dietary behaviors to reduce caloric intake and eat a low-salt, low-fat diet. Though there were only moderate intercorrelations

of factors, each still seems to measure and correspond to a unique, yet conceptually rational, health-related dietary behavior. One of the biggest drawbacks to this scale is the low test-retest reliability. However, due to the nature of self-efficacy as a state, perhaps even the 1-2 week delay between instrument administrations may be enough to explain the difference in scores over time. Finally, the correlation of the scale, in the expected manner with the dietary index and MHLC, suggests that these are related constructs.

Although this scale measures self-efficacy beliefs of an individual, not promoting these behaviors in another, it may be very useful for development of such an instrument. This scale does not solely cover intake behaviors but seems to focus upon healthy dietary intake behaviors and self-efficacy for engaging in these behaviors when faced with common barriers. Nevertheless, it may be useful for testing concurrent validity of a new scale for parental self-efficacy for enacting healthy dietary behaviors in their children, as parental intake is often associated with their child's intake.

Lastly, the sample for which this study was developed coincides with a more general sample of parents of children, even if the children are not within the age group specified here, or if the parent is not currently trying to change their dietary intake habits. One of the questions derived from this study is the generalizability of psychometric properties to the proposed target population. The sample used for psychometric testing had a mean age of 21.3 years and were not required to have a child of any age in the home. Additionally, they were primarily female (75%) and Caucasian (90%). Thus, if this scale is used in any other sample, psychometric assessment of the scale should be conducted within that group before any judgments of self-efficacy in this domain are made.

Measures of Exercise, Physical Activity or Health-related Behaviors

The Self-efficacy for Exercise Behaviors[228] scale was developed in conjunction with the Self-efficacy for Eating Behaviors scale previously described. It measures the self-efficacy for exercise behaviors in specific situations. This instrument consists of 12 items measured on a 5-point Likert-type scale from 1 (I'm sure I can't) to 5 (I'm sure I can). Participants rate their confidence in their ability to motivate themselves to perform a behavior consistently. Self efficacy is measured for resisting relapse (5 items) and making time for exercise (7 items).

Initial scale development relied upon the same study described above. Individual structured interviews were used to determine behaviors common in those engaging in regular physical activity. The initial scale consisted of 49 items. Principal component factor analysis using data from the 171 participants previously described suggested a scale consisting of only 12 items with two factors that explained 36.9% of the variance. The individual factors (percentage of variance) were: (1) resisting relapse (29.2%) and (2) making time for exercise (7.7%). Factor loadings for the individual items within each factor ranged from 0.65 - 0.82 for resisting relapse and 0.40 - 0.82 for making time for exercise.

Cronbach's alpha coefficients for the initial and test-retest samples for each factor were: resisting relapse (0.85, 0.68) and making time for exercise (0.83, 0.68). Intercorrelation of the factors was 0.55.

The investigators also used other scales which they felt would assess construct- and criterion-related validity. First, participation in regular vigorous physical activity was quantified. Significant correlation with participation in vigorous activity was seen

for both resisting relapse (0.32) and making time for exercise (0.40). Participants also completed the MHLC scale previously described. The MHLC Internal subscale correlated significantly (P<0.001) with both the resisting relapse (0.29) and making time for exercise (0.42) self-efficacy subscales. MHLC Chance significantly correlated (P<0.01) only with the making time for exercise subscale (-0.18). MHLC Chance and External otherwise showed non-significant negative associations with the self-efficacy subscales.

The strengths of this scale manifested during its development were theoretical and methodological rigor, factor uniqueness and correlations, reliability and validity. Most of the weaknesses are the same as previously described, including target sample and sample characteristics used for psychometric assessment. Additionally, this scale measures self-efficacy beliefs of an individual, not for promoting these behaviors in another. However, it may help guide the development of such an instrument focusing on engaging one's children in physical activity or to test the concurrent validity of a new scale for parental self-efficacy for enacting healthy physical activity behaviors in their children, as parental involvement in physical activity is often associated with their child's participation.

The Physical Activity Self-efficacy[229] measure was developed for use during a study to test a conceptual model of parental activity orientations, support for physical activity and children's self-efficacy for physical activity participation. The children in the study were in grades 5 - 12. This 5-item scale is measured on a 5-point Likert-type scale, ranging from 1 (I'm sure I can't) to 5 (I'm sure I can). Children are asked to rate their confidence in their ability to overcome common barriers in order to participate in

physical activity. The study in which this instrument was used consisted of a sample of 380 children (14.0 ± 1.6 years) and their two parents.

The internal consistency alpha was 0.85. Test-retest reliability for the scale, after one week was R = 0.89. Approaches to estimating internal consistency and test-retest reliability were not delineated. Although specific measures of validity were not included, standardized path coefficients in the investigators' proposed model were calculated, including a coefficient between scores on this instrument to a measure of actual physical activity participation by the children. Children were asked to record their 7-day participation in 47 common activities. A weekly activity index was calculated by multiplying frequency of involvement in these activities by the standardized metabolic equivalent value/weighting. A significant (p<0.0001) standardized path coefficient between self-efficacy score and actual physical activity was noted (0.20).

The internal consistency and test-retest reliability were good, despite no delineation of the approaches to their estimation. Additionally, the theoretical background for this measure, parental influence on children's self-efficacy for physical activity, is in keeping with the need to develop a measure of parental self-efficacy for enacting healthy behaviors, such as engagement in physical activity. Despite these strengths, the rigor involved in the development of this measure was not as evident as in other tools. Demonstration and discussion of the validity of this instrument is. In addition, it is a measure of the child's self-efficacy, not the parent's for getting their children active.

The Self-Rated Abilities for Health Practices[230] questionnaire measures self-perceived abilities to engage in general health-promoting behaviors in four major areas:

nutrition, exercise, psychological well-being and health responsibility. The scale consists of 28 items rated on a 5-point Likert-type scale. Responses range from 0 (not at all) to 4 (completely). Respondents rate how well they are able to perform a health-related practice. There are four subscales: nutrition, exercise, psychological well-being (i.e. stress management) and health responsibility. Each subscale consists of 7 items.

The original 50 items for the scale were developed by the lead authors, using a literature review and clinical and research knowledge. The tool was refined and reduced to a 32-item tool with the help of a rehabilitation nurse consultant. The 32-item tool was then reviewed by a group of expert reviewers, including doctorally prepared nurses with health promotion expertise, an expert in tool development, and a specialist in education. A pilot sample of 15 adults was then used to help refine content and directions for the instrument. Feedback from these groups resulted in the 28-item tool examined for psychometric properties.

Three separate samples were recruited for psychometric testing: (1) 188 adults (ages 17-80 years) attending a community health fair, (2) 111 undergraduate students enrolled in a health promotion class at a university and (3) 177 adults with disabilities recruited by mail through a state-wide disability advocacy group.

Principal components factor analysis with varimax rotation of the results from sample 1 produced four factors that accounted for 61% of the variance. The four factors were in agreement with the proposed structure used during development. The factor loading for each factor ranged from: (1) Nutrition (0.60 - 0.72), (2) Exercise (0.36 - 0.85), (3) Psychological Well-being (0.48 - 0.79) and (4) Responsible Health Practices (0.55 - 0.72). Internal reliability of the scale in this sample was 0.94, and ranged from 0.81 to

0.92 for the subscales. Concurrent validity was measured in this sample by asking participants to complete the General Self-efficacy Scale (GSES), which had a reliability coefficient alpha of 0.86 in this sample. Correlations were significant between the GSES and the SRAHP (0.43), as well as for each subscale (0.26 to 0.44).

Internal reliability coefficient of the scale in sample 2 was 0.94 and ranged from 0.81 to 0.89 for the subscales. Participants also were asked to complete the instrument after two weeks to assess test-retest reliability. Pearson correlations were calculated for the total score (0.70) and each subscale (0.63 to 0.73).

Convergent and construct validity were assessed in sample 2 by asking participants to complete the Health-Promoting Lifestyle Profile (HPLP). The HPLP is a well-regarded instrument which measures similar phenomena regarding frequency of engaging in activities that increase health and well-being. The subscales are exercise, self-actualization, health responsibility, inter-personal support, nutrition and stress management. Total scores on the SRAHP and HPLP correlated strongly (0.69, $p<0.01$). In addition, the subscales on the HPLP and SRAHP that were related were the most highly correlated; nutrition with Nutrition (0.48), exercise with Exercise (0.58), self-actualization (0.65), stress management (0.55), and support (0.56) with Psychological Well-being, and health responsibility with Responsible Health Practices (0.57).

In order to test discriminant validity individuals also were asked to complete the Barriers to Health-promoting Activities for Disabled Persons Scale (BHADPS). The BHADPS measures how one believes various factors interfere in the ability to manage one's health as they relate to barriers for health promotion. It also has demonstrated the ability to discriminate between those with and without disability. Scores on this scale

and the SRAHP were expected to negatively correlate, and did so with significant correlations on the total score (-0.55) and the subscales (-0.54 to -0.39).

The alpha coefficients for the third sample were 0.91 for the total score and ranged from 0.76 to 0.90 for the subscales. In order to test the ability of the SRAHP to distinguish between groups expected to have differing scores on the test, scores on the SRAHP were compared between sample 3 and sample 1. Total scores on the SRAHP were significantly lower in sample 3 than in sample 1. Sample 3, with a disability, scored lower on every subscale, except the Responsible Health Practices subscale. However, only the Nutrition and Exercise subscale were significantly different.

The psychometric properties of this measure were strong and the most fully reported of the instruments evaluated in this review. The attention to detail in the development of the tool, with content created from work with four different groups, was the beginning of a rigorous appraisal. The reliability checks, with three population samples and with a 2-week test-retest revealed strong correlations. The additional evaluations of the measure in several samples, against gold-standard measures of both differing and similar concepts and against opposite measures strongly suggests that this measure is valid.

In addition to the strong psychometric properties of this questionnaire, it is conceptually congruent with the development of measures of parental self-efficacy for changing multiple health-related behaviors in their children. The validity of this measure, especially its assessment with other well-accepted measures, suggests that this tool may be used as an instrument for future tests of convergent validity. However, the Well-being and Health Practice factors are not in congruence with needs for a scale of parental self-

efficacy for enacting behaviors in their children. In addition, the items on the Nutrition and Exercise do not cover the entire range of desired behaviors for an inclusive self-efficacy scale for parents and contains some items that may be superfluous to such a scale.

Measures of Parenting

The Parenting Sense of Competence scale[231, 232] (PSOC) was developed to measure parenting self-esteem, which is believed to be associated with child behavior and parental functioning. Included in this measure are two rationally derived subscales of efficacy (PSOC-E) and satisfaction. The PSOC consists of 17 items answered on a 6-point Likert-type scale ranging from 6 (strongly disagree) to 1 (strongly agree). The PSOC-E subscale consists of eight of these items.

Originally developed by Gibaud-Wallston and Wandersman in 1978,[231] psychometric data were not published on this instrument until 1989, by Johnston and Mash.[232] These psychometric properties are based upon a sample of parents (297 mothers and 215 fathers) with children ages 4-9 years randomly sampled in a large Canadian city. Principal component factor analysis initially revealed four factors, but only two of these were easily interpretable, accounted for over 10% of the variance, and had more than three items with factor loadings over 0.40. These two factors, satisfaction and efficacy, appeared related to the psychometric data reported by Gibaud-Wallston and Wandersman,[231] so the analysis was repeated with a forced two-factor solution. As only the PSOC-E is conceptually relevant to the development of a parental self-efficacy scale for enacting health-related behaviors in their children, only these subscale results will be

discussed. The PSOC-E accounted for 12.5% of the variance with an eigenvalue of 2.13. Factor loadings of the PSOC-E ranged from 0.53 - 0.71. The total PSOC score accounted for 36% of the variance. Oblique rotation revealed a correlation of 0.22 between the two factors. Alpha coefficients of 0.79 and 0.76 were calculated for the total PSOC and PSOC-E, respectively.

In addition to the PSOC, parents in this study were asked to complete the Child Behavior Checklist (CBCL), which appraises a range of child problems. It was hypothesized that CBCL would provide discriminant validity and associate in a negative direction with PSOC scores, as parents reporting greater child problems likely would have lower levels of self-esteem. Total PSOC scores were significantly negatively correlated with both the Internalizing (-0.21) and Externalizing (-0.24) subscales of the CBCL. The PSOC-E was only negatively correlated significantly with the CBCL Externalizing subscale (-0.10). However, it was posited that CBCL would have stronger correlations with the other PSOC subscale, Satisfaction. However, further analysis of mothers and fathers showed no PSOC-E correlation in mothers, but significant correlations in fathers for both the Internalizing (-0.17) and Externalizing (-0.15) subscales of the CBCL. Scores on the PSOC and subscales were compared for mother-father pairs, referencing the same child, and were significant for total score (0.31) and PSOC-E (0.31).

Several other studies also reported the psychometric properties of the PSOC-E. Internal reliability of the PSOC-E in a sample of 91 mothers with children in preschools or day care centers was 0.82. Assessment of convergent validity of scores on the PSOC-E with those on the PLOC Short Form (PLOC-SF) revealed a significant correlation (-

0.24).[240] Scores on the PSOC-E were expected to discriminate between scores on the negative affects scale of the Positive and Negative Affect Schedule (PANAS-Neg). There was a significant correlation (-0.31) between the scales in the predicted direction.

In a sample of 48 mothers of 3-6 year old children in a small Midwest community,[240] the alpha coefficient of the PSOC-E was 0.88. The PSOC-E also correlated significantly (0.33) with the Secure Attachment dimension of the Relationship Scales Questionnaire. In addition, the hypothesized inverse relationships of the PSOC-E to the PANAS-Neg (-0.39) and the Eyberg Child Behavior Inventory (ECBI) Intensity (-0.31) subscales were demonstrated with significant correlations.

The relationship of this measure of parenting efficacy to a measure of parental self-efficacy for enacting healthy dietary and physical activity behaviors in their children is excellent. The psychometric data are strong, and the wide-spread acceptance of this measure as a standard measure makes it meaningful in assisting with development and testing of a new instrument. A final strength is the inclusion of mothers and fathers in the samples used for development and testing of this tool.

However, this scale is a measure of general parenting self-efficacy; it does not focus on the domains of dietary or physical activity behaviors. Thus, although this appears to be an excellent scale in many regards, its use is limited to assisting in the generation of item format to reflect parental sense of self-efficacy in how they enact the behaviors in the desired domains in their children.

The Parental Locus of Control questionnaire (PLOC)[233] assesses parent locus of control. Evidence suggests that parental locus of control is associated with facets of the parent-child dyad, including parenting style. The PLOC is a 47-item questionnaire

answered on a 5-point Likert-type scale, with respondents rating their agreement with various examples of locus of control. Answers range from 1 (strongly disagree) to 5 (strongly agree). The PLOC consists of 5 subscales, including an efficacy subscale (PLOC-E), which consists of 10 items.

To develop the PLOC, 200 items generated by a review of the literature and the researcher's expertise. These items were provided to 18 faculty and graduate students familiar with the locus of control concept, who rated each item on a 9-point continuum. From the feedback provided, 109 items were selected for a pilot study of 147 parents of elementary-school age children in Alabama. Principal-axis factor analysis with varimax rotation of the responses yielded five factors containing 68 items. In the interest of shortening the scale, the developers eliminated items with the lowest factor loadings to create a 47-item scale. The final scale, with a Cronbach's alpha during pilot testing of 0.92, consists of five subscales: Parental Efficacy (10 items, $\alpha = 0.75$), Parental Responsibility (10 items, $\alpha = 0.77$), Child Control (7 items, $\alpha = 0.67$), Fate/Chance (10 items, $\alpha = 0.75$) and Parental Control (10 items, $\alpha = 0.65$). Only the psychometric properties for the total PLOC and the PLOC-E will be reported further. The ten items on the PLOC-E had factor loadings ranging from 0.35 to 0.61.

Further assessment of the psychometric properties of the PLOC-E was conducted with a sample of 105 parents of elementary school-age children. The Cronbach's alpha (0.44) for the PLOC-E in this was lower than in the pilot study. However, after elimination of a single item which appeared to communicate multiple associations, the alpha increased to 0.62.

The PLOC-E was hypothesized to have a positive relationship with the Parenting Stress Index Sense of Competence subscale (α= 0.6 – 0.9), and it did (r=0.12), although it was not significant. The General Self-Efficacy factor (α=0.86) of the Self-Efficacy Scale, a commonly used instrument to measure general self-efficacy, was expected to inversely correspond to the PLOC-E, and it did (r= -0.27, p<0.01).

An additional estimate of discriminant validity was conducted by comparing scores on the PLOC-E between parents in the sample divided into two separate groups: those with no parenting problems and those who reported difficulty with parenting. The Wilk's Λ was significant between the groups on the PLOC total scale and the PLOC-E. The scores also differed in the expected direction.

The psychometric properties of the PLOC-E suggest that the scale is a reliable measure. The development of the scale followed appropriate measures to ensure adequate content. Thus, the items on the PLOC-E may also provide a sense of guidance for development of new items for a similar scale, albeit with a different and more specific focus. Additionally, the sample used for psychometric testing included both mothers and fathers, which increases confidence in the generalizability of the results. Finally, the evidence of concurrent, convergent and discriminant validity suggests that it measures its intended concept and discriminates among different groups and may be confidently used to test the convergent and concurrent validity of a new instrument.

However, as with the PSOC-E, the items on the PLOC-E do not touch on parental expectations about who controls dietary or physical activity behaviors in their children. Instead, its focus is on parental expectations regarding the locus of control of the parent's

life and of a child's "good" or "bad" behavior (i.e. listening to the parent or throwing a tantrum).

The Toddler Care Questionnaire[237] (TCQ) provides a measure of maternal confidence during their child's toddlerhood. The definition of confidence used for this measure was drawn from self-efficacy theory as, "a mother's perception that she can effectively manage a variety of tasks or situations related to parenting her toddler."[237, p. 19] A toddler is defined as a child ages 12- to 36-months. The TCQ consists of 36 items rated on a 5-point Likert-type scale from A (very little) to E (quite a lot). The mothers are asked to rate their level of confidence they have with various activities.

The initial 37-item TCQ was developed from the literature and the researcher's experience. This was pilot tested on a convenience sample of 20 mothers, with an internal reliability alpha coefficient of 0.93. After items were revised or deleted based upon participant comments, the remaining 36 items were reviewed by a panel of experts in maternal-child nursing, child development, and psychometrics. The revised TCQ was then tested on a convenience sample of 50 mothers with at least one child ages 1-3 years drawn from pediatricians' offices and community groups.

Cronbach's alpha for internal reliability in the study sample was 0.95. Test-retest reliability after 3-5 weeks in 43 of the mothers was 0.87. It was hypothesized that prior experience with young children would prepare mothers for parenting. Thus, the amount of prior experience with young children was assessed, but it was not related to the TCQ. It was also hypothesized that depression would have a negative association with feelings of confidence. Therefore, the participants were asked to complete the Beck Depression Inventory, which had a significant negative correlation with TCQ scores (-0.31).

The psychometric data for this tool suggest that it has both internal consistency and test-retest reliabilities in the sample population. However, the target population, mothers of children ages 12- to 36-months, excludes a substantial portion of the parenting population, including fathers and parents of both genders with children ages 3-years and older. In addition, the unexpected lack of correlation with prior experience raises doubts as to whether the questionnaire is a valid measure of confidence. Finally, this questionnaire only has a single item related to dietary or physical activity behaviors, "Knowing what your child will and won't eat."[237, p.20] However, simply knowing what the child likes or dislikes does not reflect on the domain of healthy dietary behaviors. Thus, this questionnaire does not appear to have much utility for development of a questionnaire to assess parental self-efficacy for enacting healthy dietary or physical activity behaviors in their children.

Conclusions

This review provides insight into the state of the science for measurement of parental self-efficacy in various domains. As it stands, there appears to be a lack of instruments to measure parental self-efficacy for enacting behaviors in their children across the domains of healthy eating and physical activity. Evaluation of these nine instruments in the three areas (healthy eating or dietary behaviors; physical activity, exercise or health-related behaviors; parenting behaviors) yielded some common results.

Analysis of the three measures of healthy eating or dietary behaviors revealed several trends. First, each measure focused upon the behaviors of the individual her/him self and not on enacting a behavior in another. In addition, two of these instruments targeted only upon the intake of F&V and do not cover other areas of healthy eating

behaviors, such as a reduced intake of salt, fat or calories. The Self-efficacy for Eating Behaviors[228], which did include these other dietary concerns, did not focus upon specific intake, but general behaviors in relation to reducing intake of salt, fat and calories in specific situations that commonly present a barrier to these healthy eating practices. The last limitation with all of these measures relates to the sample used for testing of the psychometric properties or for whom the instrument is designed. Each one did not coincide with the desired general US population of parents with children.

For the measures of exercise, physical activity or health-related behaviors, each of the three scales analyzed focused upon the self-efficacy of the individual. None of the measures assessed a person's self-efficacy for enacting behaviors in these domains in another. Use of these tools for measuring parental self-efficacy for enacting healthy eating and physical behaviors in their children, as with the instruments previously discussed, is limited due to the population sample used for evaluation, dearth of information regarding validity testing, or lack of conceptual fit.

Finally, the three measures of parenting reviewed were better aligned with the target population of parents with children. The PSOC-E and PLOC-E both included both mothers and fathers of young children in their sample for psychometric evaluation. The TCQ, though, targeted only mothers of toddlers (1-3 years old). However, these instruments are designed to be more general measures of parenting. Thus, they do not focus upon or contain items related to the desired domains of healthy eating or physical activity behaviors. Finally, these measures do not measure self-efficacy beliefs for enacting behaviors in another.

Despite these considerations, most of the measures are well-designed instruments with robust and rigorous psychometric testing. Despite limited direct utility for measurement of parental self-efficacy for enacting healthy eating and physical activity behaviors in their children, these instruments are useful tools for the development of new measures in this and other domains. In particular, items that were developed for these scales, especially those with high factor loadings on factor analysis, may be useful to guide development of items for a new instrument. This analysis may help others who are looking to develop instruments in similar domains or provide additional support or insight to those wishing to use the reviewed instruments for assessment purposes in their own research.

CHAPTER 4: A NEW QUESTIONNAIRE TO MEASURE PARENTAL SELF-EFFICACY FOR ENACTING HEALTHY LIFESTYLES IN THEIR CHILDREN

The problem of childhood overweight and obesity has reached epidemic proportions in the United States. The consequences of obesity are well-known, with effects that are physical, psychosocial and financial.[11, 19, 28] Childhood is an important period for the prevention of overweight and obesity, as many diet and physical activity behaviors are learned during this time and carry on into adulthood.[29, 207] It is known that parents play a key role in the learning and development of behavior patterns in children, acting as role models for their children and mediators of the household environment and should thus be targeted for intervention.[11, 39, 133] In particular, targeting parents of children 6-11 years old is critical as preadolescent children are more reliant upon their parents for food choices available at home and when dining out.[241] As Kelder and colleagues[242, p. 1121] stated, "...early consolidation and tracking of physical activity [and] food preference…implies that interventions should begin prior to sixth grade, before behavioral patterns are resistant to change."

The US Department of Agriculture (USDA) provides Americans with guidelines for a healthy lifestyle via the MyPyramid Food Guidance System (Pyramid).[64] The Pyramid, since its original release in 1992, is one of the most well-known and utilized healthy lifestyle guides of all time.[243-245] Despite being recognized by more than two-thirds of US adults,[244] many Americans do not use the guidelines in their daily lives,[243, 245] and they state that they do not know how, nor do they possess the belief in their own ability or self-efficacy, to apply the recommendations.[243] In fact, findings have long

shown that knowledge of healthy diet and physical activity behaviors do not translate into healthier behavior.[210, 246] According to Bandura[56], a person is more likely to perform a behavior if he/she possess confidence in his/her ability to perform that behavior, achieve a positive outcome and overcome barriers. This confidence, or self-efficacy, is the moderator between the know-how to perform a behavior and actually engaging in that behavior. Parents are often well informed and possess knowledge of healthy diet and physical activity recommendations, yet have difficulty and lack self-efficacy for translating that knowledge into their family lifestyle.[45, 55]

Thus, it is evident that interventions need to focus upon increasing parental self-efficacy to engender a family ethos espousing healthy diet and physical activity for their children. To determine the effect of a self-efficacy intervention, there must be a means to measure change or improvement in the self-efficacy beliefs of the parent and how that may change across time. However, extensive review of the literature shows a lack of instruments to measure this phenomenon. Therefore, the purpose of this study was to develop and test a questionnaire that assesses parental self-efficacy beliefs to engender a family ethos espousing healthy diet and physical activity for their children ages 6-11 years.

Research Design

Sample

The target population for this study was US parents of children 6 to 11 years old. Eligibility requirements were; (1) parent of a child 6-11 years old, (2) able to read and write in English, and (3) available computer with internet access. A convenience sample

with recruitment via the internet was used to identify a diverse sample of participants representative of parents with children in that age group from many racial, ethnic, socioeconomic status (SES) and US regional groups, to which research findings may apply.[247] Recruitment via the internet included postings to numerous parenting discussion groups and websites, such as www.parents.com. The postings contained a brief introduction to the study and its purpose, as well as a link to, or URL address for, the questionnaire. Additional recruiting methods included: sending e-mails to several parental, professional and healthcare organizational membership lists, posting fliers at several local pediatrician and pediatric dentist's offices and postings to an internet-based social networking site (Facebook©). Word-of-mouth also aided recruitment, since eligible participants could easily e-mail and forward information about the study to other eligible individuals within their personal network. Finally, a small incentive, a $5 electronic gift card (e-gift card) to a national retail store chain, was offered for each completion of the questionnaire. The use of incentives may increase response rates in internet-based surveys.[248] If the incentive was desired, the participants were asked to enter a valid e-mail address where he/she wished to receive this incentive.

Using the internet for the conduct of the study was done even with the knowledge that many people do not have computer and internet access or literacy.[249, 250] Recent data suggested that a majority of the US population could be reached in this way because there were over 200 million internet users, approximately 70.2% of the total population.[251] Historically, demographic subgroups such as African-Americans, Hispanics or low SES have been under-represented in internet studies due to lack of access or computer literacy, although these disparities are lessening.[249] Additionally, the sample recruited for this

study was unrestricted, although limited by inclusion criteria, and may be unrepresentative of the larger population due to self-selection.[250, 252, 253] Furthermore, since the questionnaire was completed at the leisure of the participant in this study, there was no control over the environment in which it was completed, possibly allowing random factors or events to influence the respondent.[253, 254] However, this issue is a concern with mailed surveys as well and can only be controlled via in-person interviews, which presents a large burden on participant and investigator. Finally, there was the possibility of multiple responses by a single individual.[253-255] Nevertheless, collection of specific demographic data, including respondent's and their children's birth date, allowed for identification and exclusion of multiple responses[254] and restriction of multiple responses by IP address, or the individual identifier of each computer also prevented multiple responses.[255]

An initial sample of 15 participants was recruited to pilot test and refine the questionnaire.[256] Following this pilot test, a separate sample of 145 participants was recruited to fully test the questionnaire. A sample size of 130 was suggested for a confidence interval of 0.10, with α=0.05 and an expected reliability coefficient of 0.70.[257, p. 151] An additional 15 participants were oversampled to compensate for refusals, incomplete data, and attrition.[258] The final sample consisted of 146 participants. The participants were mostly female (88%) and primarily non-Hispanic or Latino ethnicity (91%) and Caucasian race (82%). Most participants were married (84%), employed full-time (64%) and well educated (97%) with at least some college education. Total annual household income varied, but most participants (53%) came from households earning more than $75,000 annually. Demographic data are presented in Table 2 (Appendix A).

A subsample of 25 participants completed the questionnaire again in 5-10 days to evaluate test-retest reliability. This timeframe was considered long enough to ensure that participants would not recall previous responses, yet short enough that their self-efficacy would not have changed. Willing participants were asked to enter a valid e-mail address where they wished to receive a reminder e-mail and link to the questionnaire sent.

Data Collection

The University of Central Florida Institutional Review Board approved the conduct of this study. Because this study was conducted via the internet and no identifying information was required from participants, a waiver of documentation of consent was requested, and granted, for this study (Appendix B). As such, the informed consent statement (Appendix C), appearing prior to the questionnaire, included the statement that "completion of this questionnaire implies consent to participate in this study."[250] All participants who completed the questionnaire did so anonymously in an encrypted environment via SurveyMonkey© (http://www.surveymokey.com), a secure internet survey design and response collection website. All e-mail addresses provided to receive the incentive were kept separate from all other data.[254] All data were stored on a password enabled flash drive stored in a locked drawer when not in use.

Measures

The questionnaire to assess parental self-efficacy to engender a family ethos for healthy diet and physical activity (Appendix D) was developed using the USDA Pyramid guidelines for healthy diet and physical activity behaviors for children[65] as well as outcome expectancies and environmental factors identified during the literature review.

This questionnaire consisted of 35 questions covering two domains: diet and physical activity. A composite score was derived from summated scores on the total questionnaire, as were diet and physical activity subscale scores.

The questionnaire was sent to eight content experts: four nurse researchers with experience in one or more content areas: obesity research, clinical obesity care, or psychometrics: three dieticians and one physician with childhood obesity clinical and research experience. These experts were asked to evaluate the questionnaire for face validity and to rate each item on a four-point scale from totally irrelevant (1) to extremely relevant (4) for content validity assessment.[257, 259-261] The plan for evaluating experts' ratings was to either rewrite or remove items ranked less than 3 by more than one content expert. However, none of the content experts ranked any of the items as less than 3. The Content Validity Index (CVI) of the questionnaire was 0.97, with an average rating of 3.41 for the items on the 4-point scale.[260, 261] Thus, the CVI was adequate and content validity of the questionnaire was deemed acceptable. All content experts also noted that the questionnaire appeared to be measuring what it purported to measure (face validity).

Subsequently, the questionnaire was pilot tested with 15 participants from the target sample. The questionnaire asked respondents to rate their confidence in their ability to perform certain tasks related to healthy diet and physical activity in their children. They rated their confidence on an 11-point scale, from "not at all confident" (0) to "mostly or totally confident" (10), derivative of a 100-point scale (0 - 100) recommended by Bandura when constructing self-efficacy scales [262]. Cronbach's alpha of responses in this sample was 0.95. The questionnaire was considered reliable and would be used evaluated with the larger study sample. Additionally, participants did not

express any difficulty with either comprehension of questionnaire items or completion of the questionnaire. Finally, no issues with the use of SurveyMonkey© arose in the collection or download of data from the website.

No identifying data were required as a part of the questionnaire. In order to characterize the sample, sociodemographic data (Appendix E) were collected and included: age, race, ethnicity, gender, marital status, highest educational level achieved, work status, household income, zip-code of primary residence, parental contact and number of children, with their ages, height and weight.

Two existing surveys were used to estimate concurrent validity. Since there were no existing surveys to measure parental self-efficacy for enacting healthy diet or physical activity in their children, questionnaires regarding self-efficacy of the parents for their own diet and physical activity behaviors were selected. The measure of the self-efficacy of parents was used since data have shown that parental behaviors and self-efficacy beliefs were related to those of their children. Therefore, it was expected that if parents had higher self-efficacy beliefs for their own eating and physical activity behaviors, they would have higher self-efficacy beliefs in their ability to provide the same environment for their children. Two surveys, the Self-efficacy for Exercise Behaviors Scale (SEB-Ex) (Appendix F) and Self-efficacy for Eating Behaviors Scale (SEB-Eat) (Appendix G) were used[228]. Both the SEB-Ex and SEB-Eat asked individuals to rate their confidence in their ability to motivate themselves to do certain activities consistently for at least six months. The 5-point Likert-type scale of each survey ranged from 1 (I know I cannot) to 5 (I know I can). The SEB-Ex consists of 12-items on two subscales, 'resisting relapse' and 'making time for exercise', which each showed an adequate internal consistency (α=0.85

and α=0.83, respectively), although test-retest reliability (r=0.68, p<0.001 for both) was not as strong. The SEB-Eat consisted of 61items on five factors. All of the SEB-Eat subscales demonstrated an adequate internal consistency (α=0.85 – 0.93), although test-retest reliabilities (r= 0.43 – 0.64) were not strong.

Data Analysis

All data from the questionnaire responses were downloaded directly from the SurveyMonkey© website. Once data were checked for completeness, all analyses were completed using SPSS version 15.0 (SPSS, Inc., Chicago, IL.). Responses from the questionnaire were summed to create a total parental self-efficacy score. Subscales for healthy diet and physical activity self-efficacy were summed to create subscale scores.

Internal consistency reliability was assessed by computing Cronbach's alpha for each factor derived from the exploratory factor analysis and for the total score. Test-retest reliability was examined in a subsample of the total participant sample who were willing to complete the questionnaire a second time, within 5 to 10 days. Test-retest reliability was assessed by computing the Pearson correlation coefficients for each individual item and the total scores. Demographic data were descriptively analyzed.

The determination of the factors present within the 35 items was conducted using maximum likelihood factor analysis. Three criteria were used to determine the number of factors to rotate: the a priori hypothesis that the measure had two dimensions, the scree test, and the interpretability of the factor solution. Item analysis was performed by calculating the correlation of each item with its own subscale (with the item removed) and with the other subscales using a Bonferroni correction. Thus, a p-value of less than 0.005 was required for significance. Concurrent validity was assessed by computing

Pearson correlation coefficients between the new questionnaire total scores with the SEB-Ex and SEB-Eat total and subscale scores. Pearson correlation coefficients were also computed between the DB subscale scores and SEB-EAT total and subscale scores. Finally, the correlation between the PAB subscale scores and the SEB-Ex total and subscales scores were calculated.

Results

Data Analysis

Internal Consistency Reliability

Cronbach's alpha coefficients were computed for the original 35 items, for the 34 items that were retained for the final version, and for the two subscales (DB and PAB). The coefficient alpha for the initial 35-item scale was 0.94 and remained at 0.94 after removal of question number 33, "How confident are you that you can limit your child's screen time (i.e. T.V., video games, computer) to no more than 2 hours per day?." The DB subscale had an alpha of 0.93, which did not change with removal of question 33. The PAB subscale had an alpha of 0.92. However, when question 33 was removed, the alpha increased 0.94.

Test-retest Reliability

The subsample of 25 participants used to evaluate test-retest reliability all completed the parental self-efficacy questionnaire a second time between 5 and 10 days after their initial completion. All item and score (total and subscale scores) correlations between participants' responses at time 1 and 2 were significant at $p<0.05$. Item

responses between questionnaire administrations correlated significantly for both the DB (0.50 – 0.95, $p<0.05$) and PAB (0.53 – 0.92, $p<0.01$) subscales. Total questionnaire (0.94), DB (0.89) and PAB (0.93) scores between times 1 and 2 were also significantly ($p=0.000$) correlated.

Demographics Analyses

Correlations between demographic groups such as race or income level and questionnaire responses or scores did not reveal any significant results.

Construct Validity

Factor Analysis

Two factors were rotated using a varimax rotation. The rotated solution yielded two interpretable factors, dietary behaviors (DB) and physical activity behaviors (PAB). Dietary behaviors accounted for 25.3% of the item variance, and PAB accounted for 16.8% of the item variance. The scree plot confirmed that the initial hypothesis of bi-dimensionality was correct.

Exploratory factor analysis also revealed that question number 33 loaded more strongly onto the DB factor, contrary to the *a-priori* belief that it would be related to physical activity. However, the item did not load very strongly onto either factor, with factor loadings of 0.37 and 0.35 on the DB and PAB factors, respectively. Therefore, this item was removed from the questionnaire and excluded from further analysis

Item Analysis

In support of the questionnaire's validity, items were more highly correlated with their own subscale than with the other subscale, with one exception: question 33. Items on the DB subscale correlated more strongly (0.31 – 0.70) with other items on the DB subscale versus items on the PAB subscale (0.12 – 0.43). Other than question 33, all items on the PAB subscale (0.67 – 0.90) correlated more strongly with other items on the same scale versus items on the DB subscale (0.36 – 0.44).

Concurrent Validity

Correlations between the questionnaire total scores and the SEB-Eat (0.51) and SEB-Ex (0.35) total scores were both significant (p=0.00). Total score on the questionnaire also significantly (p=0.00) correlated with subscale scores of the five SEB-Eat (0.32 – 0.48) and the two SEB-Ex (0.32 & 0.34) subscales. The DB subscale scores significantly (p=0.00) correlated with all SEB-Eat subscales (0.38 – 0.50) and the SEB-Eat total score (0.55). The PAB subscale correlations with the SEB-Ex total and two subscale scores were all less than 0.06 and not significant.

Discussion

In this study, a new measure of parental self-efficacy for enacting healthy lifestyles in their children was developed and its psychometric properties were tested. Evaluation of responses from 146 parents of children 6-11 years old resulted in the removal of one item, resulting in a 34-item questionnaire clustered into dietary and physical activity behavior subscales and a total parental self-efficacy score.

Despite the increased access to the internet across various demographic groups, the sample collected for this study was not as diverse as anticipated, since racial and

ethnic minority groups were not well represented in this sample. This was recognized as a possible challenge during study design and resulted from a convenience sample primarily drawn from e-mail and internet recruitment. Therefore, potential participants were limited to those with computer and internet access and with adequate computer literacy to respond via the SurveyMonkey© website.

The general homogeneity of the sample in this study made the analysis of difference between various demographic groups difficult, as the number of minority participants was too small to identify between-groups differences. Given the results of this study, further testing of this questionnaire with a more racially and ethnically diverse sample of parents who have children of different age groups is warranted. Additionally, the self-report data provided by the participants for the height and weight of their children yielded such an abnormal distribution that this data was unusable. For example, the data provided by the parents suggested a prevalence of children below the 5^{th} percentile and above the 97^{th} percentile of BMI for age that far exceeded the US population norms.

It was also interesting to note that there was an apparent snowball effect as information about the study was forwarded amongst interpersonal, social and professional networks unknown to the investigator. Another aspect that warrants further investigation is the use and efficacy of social networking internet sites (i.e. Facebook©) for the promotion of and recruitment for a research study. Social networking sites, such as Facebook©, are growing in popularity. Currently, Facebook© has more than 250 million users, with each one having an average of 120 "friends" on the site. In addition, over 70% of Facebook© users are outside of the US. In all, 120 million Facebook© users log on to the site at least once each day, accounting for more than 5 billion minutes

spent on the site each day worldwide. Once limited only to college students, two-thirds of current Facebook© users are outside of college. Finally, the fastest growing user demographic is those over the age of 35 years.[263] These staggering numbers and the expansive reach of social networking internet sites make this an interesting media to consider for the recruitment and/or conduct of research.

Findings from this study suggest that the questionnaire has robust reliability estimates. The total scale score and DB and PAB subscale scores demonstrated strong internal consistency. Test-retest reliability reliabilities for total scale and DB and PAB subscale scores were also strong.

Measures of validity used in this study also suggest the instrument is a valid measure of the constructs desired. The initial evaluation of content and face validity by eight content experts suggested that the questionnaire, as designed, appeared to measure what it purported and contained the necessary items to measure these constructs.

Results of the factor analysis suggested two factors, DB and PAB, as was intended during item development. However, question 33, "How confident are you that you can limit your child's screen time (i.e. T.V., video games, computer) to no more than 2 hours per day?" did not load on either factor (diet or physical activity), despite being conceptually generated as a physical activity item. Perhaps the specific item as an outlier should attempt to convey that limiting screen time has long been related with increasing physical activity time.[264, 265] Therefore, this item was removed from the questionnaire for further analysis. The remaining 34 items, however, all associated fittingly with their conceptually appropriate subscale. Item analysis further supported the two-factor structure and placement of items on each factor.

Evaluation of the concurrent validity was conducted using the SEB-Eat and SEB-Ex scales. It was hypothesized that the SEB-Eat and SEB-Ex scores, for which the participants rated themselves, would correlate with the scores on the parental self-efficacy questionnaire. These scales were selected because previous research suggested that parental behaviors often correlate with those of their children. Results of the analyses confirmed this. The questionnaire total scores significantly correlated with both the SEB-Eat and SEB-Ex total scores. However, the moderate correlations (0.51 and 0.35, respectively) support the notion that the questionnaire is, in fact, measuring a new concept.

Of interest, though, is the strength of the correlation between questionnaire scores and SEB-Eat and SEB-Ex scores. The questionnaire total score correlated more strongly with the SEB-Eat (0.51) than the SEB-Ex (0.35). This is possibly because physical activity within a household is generally not as consistent across the family members as is dietary intake. In general, the parental figures in a household decide on what foods are purchased in a store or restaurant or prepared for meals, especially for this age group. In addition, one would expect that dietary choices within a household are mostly consistent amongst family members, as meals are generally prepared for a group rather than individuals, thus increasing the likelihood that parents and their children essentially are eating the same food items.

Conversely, parents' perception of their own ability to be physically active is not as strongly related to their belief in their ability to get their children to be physically active. Many parents may sacrifice their own time and physical activity in order to ensure that their children are physically active. For example, a parent might enroll a

child in an activity or sport, but then must commit to providing transportation and time to the child's activity, rather than his or her own. This notion is further supported by the lack of significant correlation between DB subscale scores and SEB-Ex total and subscale scores.

Future Research and Implications

The future directions and implications for this instrument are varied and will add to the growing arsenal of tools to be used in the fight against the obesity pandemic. The first step in future research for this questionnaire will include further testing of the psychometric properties of this instrument in a broader and more diverse demographic sample. In particular, the target sample will focus on participants who are non-Caucasian races and Hispanic or Latino ethnicity. Other demographic factors, such as marital status, SES, and educational level will also be sought out. In addition, the strong psychometric properties of this questionnaire warrant the investigation of its utility with parents with children in different age groups.

Following the further assessment of the psychometric properties of the instrument in a broader demographic sample, this questionnaire can be translated and tested in other samples. The translational process requires that the translated scale demonstrate conceptual, item, semantic, operational and measurement equivalence to the original scale.[257] The translated scale would then be back-translated into English and compared to the original scale for equivalence. The first languages chosen will likely be those that are commonly found in the US, such as Spanish. Once the translation process has been completed, the psychometric properties of the translated instrument will need to be tested in the target sample. This will also open up the utility of the questionnaire to be used

with an even more diverse sample and with participants outside of the US, although item content or wording may also need to be changed in order to recognize different cultural dietary and physical activity behaviors.

The overarching goal of the development and psychometric testing of this questionnaire is for its use in interventional research. As parents are the primary agents of change for their children, interventions should be focusing upon the parents. Research has suggested that many parents claim to possess the knowledge of healthy dietary and physical activity behaviors for their children. The disconnect lies in their ability to enact these behaviors. Self-efficacy theory posits this dearth of confidence as a lack of self-efficacy. As such, in order to address the childhood obesity pandemic, interventions should be developed with the goal of increasing parental self-efficacy for enacting these healthy behaviors with their children. However, without the questionnaire developed in this study, there would be no means for assessing change or improvement in parental self-efficacy from pre- to post-intervention. This is missing piece in the arsenal filled by this questionnaire.

Another area of potential use for this questionnaire is for research investigating the relationships between factors that play a role in the childhood obesity pandemic. Researchers may use parent scores on this questionnaire to examine relationships with other parental or child measures. These parental responses could also be used for analysis of models to explain child overweight or obesity. Additionally, parental self-efficacy in these domains can be measured with this tool and assessed over time. Finally, if this questionnaire is reliable and valid for use with parents with children of other ages, comparisons of parental self-efficacy can be assessed between parents with children in

different age groups, perhaps assessing for changes in parental self-efficacy throughout their child's lifespan.

This questionnaire is another tool to be used for the assessment and treatment of childhood obesity by addressing the assessment of one of the underlying causes of childhood obesity. Through the use of this questionnaire, changes may be made in the manner in which childhood obesity assessment and prevention is approached. As more evidence is generated in support of the role of parents as agents of change and the importance of their self-efficacy for enacting healthy dietary and physical activity behaviors in their children, health education, practice and policy may change. Health education and practice may change to include the assessment and intervention of parental self-efficacy in these domains when a child is assessed for overweight and obesity risk or treatment. In addition, as the domain of parental self-efficacy for creating the healthy environment becomes an important issue in the treatment and prevention of childhood obesity, more government or community resources will be set aside to assist parents in this sphere. As such, more resources may be concentrated to target parents for intervention. Examples would be programs to supply parents with healthy dietary and physical activity options for their children or to provide parents more educational or other resources to increase their confidence and ability to provide a healthy environment for their children. These resources will help to increase parental self-efficacy by several means. First, providing dietary or physical activity resources will address barriers or act as facilitators for parents when trying to enact these behaviors in their children. According to self-efficacy theory, successfully overcoming barriers or having facilitators for behaviors will increase self-efficacy for engaging in these behaviors. Also, providing

additional educational or other resources, such as tips or practice, will increase a parent's confidence to perform these behaviors. Confidence in one's ability to repeatedly perform a behavior is self-efficacy. Successful completion of behaviors, even in a practice situation, will also boost self-efficacy.

Conclusion

The Parental Self-efficacy for Enacting Healthy Dietary and Physical Activity Behaviors in their Children Questionnaire is a reliable and valid measure of parental self-efficacy in this domain among this sample of parents of 6-11 year old children. The questionnaire consists of two separate subscales, comprised of items related either to diet or physical activity behaviors. Internal consistency and test-retest reliability of the total measure and its two subscales were strong. Additionally, the content and face validity of the questionnaire were deemed acceptable and valid by eight independent content experts. Finally, the construct validity was also adequate, as seen by the factor analysis, item analysis and concurrent validity evaluations. These psychometric properties support future use of this measure.

APPENDIX A:
TABLES

Table 1: Examples of research using instruments reviewed

Instrument or Description	Psychometric Article	Example Study Using Instrument	Objective of Research
Measures of Diet or Nutrition Behaviors			
Self-efficacy for fruit & vegetable intake	Ling & Horwath[223]	Ling & Horwath[266]	To examine the decision making for fruit and vegetable consumption in a sample of Chinese people in Singapore and to differentiate among individuals at different stages of readiness to change.
Self-efficacy for Eating Behaviors	Sallis, et al.[228]	Zabinski, et al.[267]	To examine if psychosocial correlates of behavior change, such as self-efficacy, are related to consumption of fruits, vegetables, and dietary fat in adolescents.
Measures of Exercise/Physical Activity or Health-related Behaviors			
Self-efficacy for Exercise Behaviors	Sallis, et al.[228]	Teixeira, et al.[268]	The study looked at changes in psychosocial variables, including exercise self-efficacy, and the relation with weight loss during and up to a1 year after a weight reduction program in middle-aged overweight and obese women.
SRAHP	Becker, et al.[230]	Callaghan[269]	To investigate the relationships among health-promoting self-care behaviors, self-care self-efficacy and self-care agency in 379 adults
		Callaghan[270]	To investigate the influences of basic conditioning factors, such as age, gender, marital status, religion, or race, on the practice of healthy behaviors, self-efficacy, and self-care ability.
Measures of Parenting			
PSOC Self-efficacy subscale	Gibaud-Wallston & Wandersman[231] Johnston & Mash[232] Lovejoy, et al.[240]	Herrick, et al.[271]	To study the psychosocial adaptation of fathers of boys with haemophilia and assess variables that might influence adjustment
PLOC Self-efficacy subscale	Campis et al.[233]	Werba, et al.[272]	The study explored pretreatment child, family and accessibility factors that predicted success or attrition in parent-child interaction therapy

Table 2:Demographics

CATEGORY	N	%
GENDER	145	99.3
Male	16	11
Female	129	88.4
RACE	145	99.3
White	119	81.5
Black	16	11.0
Asian	4	2.7
More than one race	6	4.1
ETHNICITY	144	98.6
NOT Hispanic or Latino	133	91.1
Hispanic or Latino	11	7.5
MARITAL STATUS	146	100
Single, never married	7	4.8
Living with partner, not married	3	2.1
Married	123	84.2
Separated	1	0.7
Divorced	9	6.2
Widowed	3	2.1
HIGHEST EDUCATION LEVEL	146	100
High School or equivalent	5	3.4
Some college	23	15.8
Associate's degree	20	13.7
Bachelor's degree	47	32.2
Master's degree	36	24.7
Doctoral degree	15	10.3
WORK STATUS	146	100
Full-time	93	63.7
Part-time	26	17.8
Full-time homemaker	10	6.8
College/University student	6	4.1
Self-employed	7	4.8
Retired	1	0.7
Not employed	3	2.1
TOTAL ANNUAL HOUSEHOLD INCOME	142	97.3
<$25,000	5	3.4
$25,000 - $49,999	20	13.7
$50,000 - $74,999	40	27.4
$75,000 - $99,999	25	17.1
≥$100,000	52	35.6

APPENDIX B:
NOTICE OF EXPEDITED INITIAL REVIEW AND APPROVAL

Notice of Expedited Initial Review and Approval
From : UCF Institutional Review Board
FWA00000351, Exp. 6/24/11, IRB00001138

To : Jonathan W. Decker
Date : September 15, 2008

IRB Number: SBE-08-05799

Study Title: **Parental self-efficacy for enacting healthy diet and physical activity behaviors in their children: Questionnaire Development**

Dear Researcher:
Your research protocol noted above was approved by **expedited** review by the UCF IRBVice-chair on 9/11/2008. **The expiration date is 9/10/2009.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The category for which this study qualifies as expeditable research is as follows:
7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.
A **waiver of documentation of consent** has been approved for all subjects. Participants do not have to sign a consent form, but the IRB requires that you give participants a copy of the IRB-approved consent form, letter, information sheet, or statement of voluntary consent at the top of the survey.
All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.
To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at http://iris.research.ucf.edu .
Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies. The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Janice Turchin on 09/15/2008 02:47:03 PM EDT

IRB Coordinator
University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

APPENDIX C:
CONSENT FORM

Informed Consent for an Adult in a Non-medical Research Study

Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study which will include about 155 people. You can ask questions about the research. You can read this form and agree to take part right now, or take time to decide. You will be told if any new information is learned which may affect your willingness to continue taking part in this study. You have been asked to take part in this research study because you are the parent of a child who is CURRENTLY between the ages of 6 and 11 years old. You must be 18 years of age or older to be included in the research study and sign this form. You must also be able to read and write English and have access to a computer and the internet.

The person doing this research is Jonathan W. Decker, MSN, ARNP, a PhD candidate in the University of Central Florida College of Nursing. Because the researcher is a doctoral student, he is being guided by Karen E. Dennis, PhD, RN, FAAN, a UCF faculty supervisor in the College of Nursing.

This study has been reviewed and approved by the UCF Institutional Review Board (IRB). You may contact the UCF IRB at (407)-823-2901 or irb@mail.ucf.edu if you have any further questions or comments.

Study title: Parental self-efficacy for enacting healthy nutrition and physical activity behaviors in their children: Questionnaire development

Purpose of the research study: The purpose of this study is to develop and test a questionnaire that assesses parental beliefs in their ability to get their children, aged 6 to 11 years, to adopt healthy diet and physical activity behaviors.

What you will be asked to do in the study: You will be asked to complete a total of 4 questionnaires. First, there is a questionnaire asking a little about yourself and your family. Next is the study questionnaire. The third and fourth questionnaires are similar questionnaires being used for comparison. At the end of the study, you will be asked for a valid e-mail address where a gift card may be sent, if you wish to receive one. In addition, you will be asked if you are willing to complete the study questionnaire another time in 5-10 days time to further evaluate this questionnaire. If so, you will need to provide a valid e-mail address where a link to the study questionnaire will be sent in 5-10 days time. Only the first 25 participants willing to complete this questionnaire a second time will be asked. Those who complete it a second time will received an additional gift card for compensation.

Voluntary participation: You should take part in this study only because you want to. There is no penalty for not taking part, and you will not lose any benefits. You have the right to stop at any time. You will be told if any new information is learned which may affect your willingness to continue taking part in this study.

Location: Your participation requires only completion of the questionnaires on a computer via the internet.

Time required: Completion of the 4 questionnaires takes approximately 20 - 30 minutes. Should you be willing to complete the study questionnaire a second time, this process takes approximately 5 - 10 minutes.

Funding for this study: This research study is supported in part by the Florida Nurses' Foundation Evelyn Frank McKnight Research Grant.

Risks: There are no expected risks for taking part in this study. You do not have to answer every question or complete every task. You will not lose any benefits if you skip questions or tasks.

Benefits: There are no expected benefits to you for taking part in this study.

As a research participant you will not benefit directly from this research, besides learning more about how research is conducted.

Compensation or payment: This research study involves two phases of data collection. If you complete all of the questionnaires at this time, you will receive a $5 electronic Target gift card. All questionnaires must be completed to receive your gift card, though you may skip questions you do not wish to answer. You must provide a valid e-mail address in order to receive this gift card.

The first 25 participants who are willing to complete the study questionnaire a second time will receive an additional $5 electronic Target gift card. If you are willing to do this, you must provide a valid e-mail address where a link to the study questionnaire will be sent in 5-10 days.

Your gift card will be e-mailed to you within one week of completing the questionnaires. Gift cards will only be sent if all questionnaires have been completed, though you may skip questions you do not wish to anwer.

Confidentiality: A list containing your e-mail address, should you choose to provide it, will be kept separate from your responses in a password protected portable memory drive in a locked filing cabinet in a locked office. When the study is done and the data have been analyzed, the list will be destroyed. Only the primary investigator will have access to this e-mail list.

Study contact for questions about the study or to report a problem:

Jonathan Decker, Doctoral Student, Nursing PhD Program, UCF College of Nursing
(407) 823-1834 or jdecker@mail.ucf.edu

Dr. Karen Dennis, Faculty Supervisor, UCF College of Nursing
(407) 823-1832 or kdennis@mail.ucf.edu.

UCF IRB: (407) 823-2901 or irb@mail.ucf.edu

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

Clicking the link below and completing the questionnaires implies consent to participate in this study.

APPENDIX D:
PARENTAL SELF-EFFICACY QUESTIONNAIRE

Parental Self-efficacy Questionnaire

Below is a list of behaviors and strategies that parents might use while trying to get their children to adopt healthy diet or physical activity behaviors. Please rate how certain you are that your 6 to 11 year old child will engage in the behaviors described below. If you have more than one child in this age range, rate all of your children who are 6 to 11 years old.

0———1———2———3———4———5———6———7———8———9———10

Not at all confident — Moderately confident — Totally confident

1. How confident are you that your child eats only 3 servings of grains (i.e. bread, cereal, rice, pasta) every day? (1 serving bread = 2 slices, 1 serving cereal, rice or pasta = 1 cup)

2. How confident are you that at least half of your child's total grain servings each day are whole grains? (i.e. Cheerios, oatmeal, whole-wheat bread)

3. How confident are you that your child eats at least 2 servings of vegetables every day?

4. How confident are you that your child will eat vegetables, even if they do not enjoy the taste?

5. How confident are you that your child eats only 3 servings of starchy vegetables (i.e. white potatoes, corn, French fries) each week?

6. How confident are you that your child eats a variety of vegetables (i.e. green, orange, yellow or red)?

7. How confident are you that your child eats 2 servings of whole fruit or 100% pure fruit juice every day?

8. How confident are you that the juice your child drinks contains 100% fruit juice?

9. How confident are you that the juice your child drinks is limited to one small glass (¾ cup) per day?

10. How confident are you that your child eats at least 2 servings of milk or an equivalent dairy product (i.e. yogurt, cheese) every day?

11. How confident are you that the dairy products your child eats are fat-free (skim) or low fat (1%)?

12. How confident are you that your child eats 2 servings of meat, beans or eggs every day? (1 serving meat = small deck of playing cards, 1 serving beans = 1 cup, 1 serving egg = 1 egg)

13. How confident are you that the meats or poultry (chicken or turkey) your child eats are low-fat or lean?

14. How confident are you that if cooking with oils, you use vegetable oils? (i.e. canola oil, olive oil)

15. How confident are you that your child eats very few solid fats (i.e. butter, margarine, shortening, lard) and foods that contain these?

16. How confident are you that your child eats very few saturated fats (found in dairy, meat, butter and chocolate) or trans fats (partially hydrogenated oils)?

17. How confident are you that your child eats foods with low sodium (salt) content or added sodium (salt)?

18. How confident are you that your child eats very few foods with added sugar (i.e. candy, cakes)?

19. How confident are you that your child drinks very few drinks with added sugar (i.e. soda, juices)?

20. How confident are you that the cereals that your child eats are unsweetened?

21. How confident are you that your child drinks mostly water or fat-free milk and not fruit juice, soda or sports drinks?

22. How confident are you that you eat meals together as a family?

23. How confident are you that your child chooses healthy foods at a fast-food restaurant?

24. How confident are you that your child chooses healthy foods at a sit-down restaurant?

25. How confident are you that your child chooses healthy foods at school?

26. How confident are you that your child chooses healthy foods when eating with friends?

27. How confident are you that there are limited unhealthy snacks (i.e. candy, cookies, cakes, chips) in your home for snacks or meals?

28. How confident are you that your child plays outside or is active in sports for a total of at least 60 minutes on most days of the week?

29. How confident are you that your child is physically active, even if the weather is bad?

30. How confident are you that your child is physically active, even if you have excessive demands at work?

31. How confident are you that your child is physically active, even if there are no gyms, parks or playgrounds nearby?

32. How confident are you that your child is physically active, even if you are concerned about safety?

33. How confident are you that you can limit your child's screen time (i.e. T.V., video games, computer) to no more than 2 hours per day?

34. How confident are you that your child is physically active when with friends?

35. How confident are you that your child is physically active, even if they have homework?

APPENDIX E:
DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

1. What is your date of birth? __ __ / __ __ / __ __ __ __
   MO DAY YEAR

2. Sex:
   __ Male
   __ Female

3. Race:
   __ White / Caucasian
   __ Black / African American
   __ Asian
   __ Hawaiian / Pacific Islander
   __ Native American / Alaska Native
   __ More than one race

4. Ethnicity:
   __ Not Hispanic or Latino
   __ Hispanic or Latino

5. Marital Status:
   __ Single, never married
   __ Living with partner, not married
   __ Married
   __ Separated
   __ Divorced
   __ Widowed
   __ Other

6. Highest education level achieved:
   __ Grade school
   __ Some high school
   __ High school or equivalent
   __ Some college
   __ Associate's Degree
   __ Bachelor's Degree
   __ Master's Degree
   __ Doctoral Degree

7. Work status:
   __ Full-time
   __ Part-time
   __ Full-time homemaker
   __ College/University Student
   __ Self-employed
   __ Retired
   __ Not employed

8. Total annual household income:
   __ Less than $25,000
   __ $25,000 to $49,999
   __ $50,000 to $74,999
   __ $75,000 to $99,999
   __ $100,000 or more

9. Zip-code of primary residence: __ __ __ __ __

10. Do you live at least 3 days per week in the same household as your child(ren) ages 6-11?
   __ Yes
   __ No

11. Information about your child(ren) ages 6 - 11

Child 1:	Date of Birth:	__ __ / __ __ / __ __ __ __ MO DAY YEAR
	Current Weight	_____ pounds
	Current Height	____ feet ____ inches
Child 2:	Date of Birth:	__ __ / __ __ / __ __ __ __ MO DAY YEAR
	Current Weight	_____ pounds
	Current Height	____ feet ____ inches
Child 3:	Date of Birth:	__ __ / __ __ / __ __ __ __ MO DAY YEAR
	Current Weight	_____ pounds
	Current Height	____ feet ____ inches

Child 4:	Date of Birth:	__ __ / __ __ / __ __ __ __ MO DAY YEAR
	Current Weight	_____ pounds
	Current Height	____ feet ____ inches
Child 5:	Date of Birth:	__ __ / __ __ / __ __ __ __ MO DAY YEAR
	Current Weight	_____ pounds
	Current Height	____ feet ____ inches

APPENDIX F:
SELF-EFFICACY FOR EXERCISE BEHAVIOR SCALE

Self-efficacy for Exercise Behavior Scale [228]

Below is a list of things people might do while trying to increase or continue regular exercise. Whether you exercise or not, please rate how confident you are that you could *really motivate* ***yourself*** to do things like these consistently, *for at least six months.*

1——————2——————3——————4——————5
I know I cannot Maybe I can I know I can

1. Get up early, even on weekends, to exercise.
2. Stick to your exercise program after a long, tiring day at work.
3. Exercise even though you are feeling depressed.
4. Set aside time for a physical activity program: that is walking, jogging, swimming, biking, or other continuous activities for at least 30 minutes, 3 times per week.
5. Continue to exercise with others even though they seem too fast or too slow for you.
6. Stick to your exercise program when undergoing a stressful life change (e.g., divorce, death in the family, moving).
7. Attend a party only after exercising.
8. Stick to your exercise program when your family is demanding more time from you.
9. Stick to your exercise program even when you have household chores to attend to.
10. Stick to your exercise program even when you have excessive demands at work.
11. Stick to your exercise program when social obligations are very time consuming.
12. Read or study less in order to exercise more.

APPENDIX G:
SELF-EFFICACY FOR EATING SURVEY

Self-efficacy for Eating Survey [228]

Below is a list of things people might do while trying to change their eating habits. Whether you are trying to change your eating habits or not, please rate how confident you are that you could *really motivate* ***yourself*** to do things like these consistently, *for at least six months.*

1——————2——————3——————4——————5
I know I cannot Maybe I can I know I can

1. Stick to low-fat, low-salt foods when you feel depressed, bored, or tense.
2. Stick to low-fat, low-salt foods when there is high fat, high salt food readily available at a party.
3. Stick to low-fat, low-salt foods when dining with friends or co-workers.
4. Stick to low-fat, low-salt foods when the only snack close by is available from a vending machine.
5. Stick to low-fat, low-salt foods when you are alone and there is no one to watch you.
6. Stick to low-fat, low-salt foods when you feel too lazy to prepare something healthy.
7. Stick to low-fat, low-salt foods when you have guests staying in your home.
8. Stick to low-fat, low-salt foods when somebody offers you a high-fat, high-salt food at a party.
9. Stick to low-fat, low-salt foods when someone eats a high-fat, high-salt food right in front of you.
10. Stick to low-fat, low-salt foods when you must eat in a hurry.
11. Eat fruits instead of cookies, candy, cake and ice-cream for dessert.
12. Eat fruits instead of cookies, candy, cake and ice-cream for snacks.
13. Stick to low-fat, low-salt foods while traveling.
14. Stick to low-fat, low-salt foods while you are drinking alcohol.
15. Avoid junk food that other family members have brought into your home.

16. Eat carrots, celery and raw vegetables instead of dips, crackers and potato chips for snacks.

17. Drink fewer diet drinks with sodium.

18. Avoid eating fast food for lunch.

19. Eat smaller portions at dinner.

20. Cook smaller portions so there are no leftovers.

21. Eat lunch as your main meal of the day, rather than dinner.

22. Stay away from the buffet table at a party.

23. Plan snaking times in advance.

24. Eat smaller portions of food at a party.

25. Eat salads for lunch.

26. Share a party food plate with a partner.

27. Plan a dinner menu ahead of time.

28. Eat a light dinner such as salad or fish.

29. Avoid eating chips, dip and sweets at a party.

30. Eat less food during the day if you are attending a party at night.

31. Bring lunch from home instead of eating out.

32. Involve your entire family in meal planning.

33. Limit snacking to designated places in the home.

34. Add less salt than the recipe calls for.

35. Eat unsalted peanuts, chips, crackers, and pretzels.

36. Avoid adding salt at the table.

37. Eat unsalted, unbuttered popcorn.

38. Use less meat in casseroles than the recipe calls for.

39. Keep the salt shaker off the kitchen table.

40. Buy fewer high salt snack items (e.g. chips and pretzels).

41. Decrease salt intake by substituting other spices in cooking.

42. Eat low salt cereals.

43. Eat meatless (vegetarian) entrees for dinner.

44. Substitute low- or non-fat milk for whole milk at breakfast.

45. Cut down on gravies and cream sauces.

46. Eat poultry and fish instead of red meat at dinner.

47. Avoid ordering red meat at a restaurant.

48. Eat at restaurants that offer a greater variety of low-fat dishes.

49. Eat cooked cereals.

50. Substitute foods like beans, peas, lentils, potatoes, corn, rice, bread for some of the meat in your diet.

51. Eat poultry without the skin.

52. Bake, broil, barbecue or steam food instead of frying.

53. Read labels for fat content.

54. Read labels for salt content.

55. Go to the grocery store on a full stomach.

56. Serve low-salt, low-fat foods to dinner or party guests in your home.

57. Post a weekly menu plan on your kitchen bulletin board.

58. Keep a food diary for one week if you begin to slip in your food program.

59. Say encouraging things to yourself if you begin to slip in your food program.

60. Keep problematic high-salt, high-fat foods out of sight, if purchased.

61. Ask your waiter not to add MSG to Chinese food

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