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EVALUATING AN ONLINE PERSONALIZED FAMILY-BASED INTERVENTION TO
PROMOTE HEALTHY LIFESTYLE CHANGES

by

SHARON HAYES
M.S. University of Central Florida, 2008

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the Department of Psychology
in the College of Sciences
at the University of Central Florida
Orlando, Florida

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Major Professor: Stacey Tantleff Dunn, Ph.D.

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ABSTRACT

The current study evaluated the initial feasibility, efficacy, and acceptability of a motivationally-tailored family-based intervention designed to promote the adoption of healthy lifestyle behaviors associated with physical activity and nutrition. Parents ($N=132$) of children 6 to 11 years old were randomly assigned to the intervention or control condition, and they completed a series of online questionnaires. Intervention participants ($n=61$) received a single motivationally-tailored feedback report via e-mail. Control participants ($n=71$) completed measures and immediately received information about a free online resource that provides information about healthy lifestyle behaviors (www.mypyramid.gov). Feasibility data indicate that an online feedback program has high dissemination potential (parents from 31 states participated). However, the current methodology is not sufficient in reaching families who are at greatest risk for developing chronic health conditions associated with obesity or low activity level. In general, the intervention was acceptable to parents. Outcome data revealed that the intervention and control groups did not differ significantly on most variables at one month follow-up. Exploratory analyses provided additional evidence for the importance of including parents and targeting parent-child interactions in the context of pediatric nutrition and physical activity interventions. Limitations and future directions are discussed.

I dedicate this work to my mom, who has been with me every step of the way.

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CHAPTER ONE: INTRODUCTION

The most recent vital statistics indicate that more than 4 million children are born in the United States annually (Martin et al., 2008). If current prevalence rates are maintained, up to 33% of those children could be classified as overweight or obese by the time they are 11-years-old (Ogden, Carroll, & Flegal, 2008). Children are classified as overweight if their body mass index (BMI) falls within the 85th to 94th percentile for their height, age, and sex, whereas obesity is defined as being at or above the 95th percentile (Barlow, 2007). BMI is predictive of adiposity, or body fat, and is considered an acceptable screening tool for clinical and research purposes (Barlow, 2007). As of 2006, Ogden and colleagues (2008) reported that approximately 12% of young children (2- to 5-years-old) and 17% of preadolescent children (6- to 11-years-old) met obesity BMI criteria. Rates for adolescents (12- to 19-years-old) were comparable to preadolescents (Ogden et al., 2008). Although some data suggest that childhood obesity rates have stabilized over the past decade, current rates remain alarming and continue to represent a marked increase from the previous four decades (Ogden et al., 2008). Rates also vary significantly based on race, such that Non-Hispanic Black (36.9%) and Mexican American (42.8%) children are affected disproportionately compared to their non-Hispanic White counterparts (31.6%) (Ogden et al., 2008). Today, government agencies like the Center for Disease Control and the National Institute of Health, as well as foundations such as the American Heart Association and the American Diabetes Association cite the need to identify early prevention and intervention methods as a top priority to combat the obesity epidemic and reduce the incidence of negative medical and psychosocial comorbidities.

More than three decades of clinical research has revealed the importance of using behavioral strategies and targeting parents in childhood obesity interventions (Wilfley et al., 2007; Young, Northern, Lister, Drummond, & O'Brien, 2007). Behavioral strategies are not always enough, however. The American way of life is, in many ways, incongruent with the promotion of physical activity and healthy eating. As a result, adopting a healthy lifestyle can be extremely challenging and individuals may experience relapse (Epstein et al., 2001). In fact, unhealthy behaviors associated with obesity are similar to those related to substance abuse (Acosta, Manubay, & Levin, 2008), and the application of substance treatments (e.g., motivational interviewing) to weight loss has been successful (Rubak, Sandbaek, Lauritzen, & Christensen, 2005; Schwartz et al., 2007). The current study sought to determine if the provision of a motivationally-tailored, web-based intervention is a viable intervention option for promoting the adoption of healthy lifestyle habits that are associated with healthy range BMI. This paper will review medical and psychosocial comorbidities of obesity, agents that contribute to the development of obesity (including parental factors), and treatments of obesity. In light of the difficulties individuals experience when attempting to make lifestyle changes, Social Cognitive Theory (Bandura, 1986; Bandura, 1992) and the Transtheoretical Model of Change (DiClemente & Prochaska, 1982) will serve as theoretical foundations for the current study.

CHAPTER TWO: LITERATURE REVIEW

Weight-Related Comorbidities

Obesity contributes to the onset of a myriad of health problems and increased morbidity and mortality (Must & Strauss, 1999), and medical complications due to adult obesity account for more than \$90 billion in expenditures each year (Finkelstein, Fiebelkorn, & Wang, 2005). As

the waistbands of adults have widened, so have those of children and adolescents. In fact, estimates suggest that up to 4% of children and adolescents meet criteria for extreme obesity (BMI > 99th percentile) (Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007). As a result of this increase, the number of adolescent bariatric surgeries has increased exponentially in the United States (e.g., Inge, Xantakos, & Zeller, 2007). The choice to undergo bariatric surgery is often difficult due to the extreme life-long dietary changes that are required, and surgeons and multidisciplinary research teams are actively evaluating the efficacy of bariatric surgery during adolescence (e.g., Inge et al., 2007). The choice to undergo surgery often is made because of the medical complications that some children with extreme obesity develop that threaten their quality of life and increase their risk of premature death (Freedman et al., 2007). However, even children without extreme obesity develop medical conditions that once were considered to be adult problems. For example, Type 2 diabetes used to be known as adult onset diabetes because of its relationship with obesity. However, it now accounts for a small but surprising percentage of all new cases in children and adolescents, especially in non-Caucasian children (Dabelea et al., 2007; Jones, 2008; Kaufman, 2002; Matyka, 2008). Physicians and researchers also report that child and adolescent BMI is associated with other health problems like hypertension (Gundogdu, 2008; McCarthy et al., 2008; Puri et al., 2008) and sleep apnea (Kohler et al., 2008; Ievers-Landis & Redline, 2007). Despite the association of increased BMI and childhood health problems, the actual incidence of these problems remains relatively low. In contrast, psychosocial consequences of obesity are quite prevalent (Puhl & Latner, 2007).

Obesity is a highly stigmatized condition and there is a significant body of literature documenting biases against the overweight and obese child (for review, see Puhl & Latner,

2007). Latner and Stunkard (2003) documented overt discrimination by children of overweight peers in their replication of a classic 1961 study (i.e., Richardson, Goodman, Hastorf, & Dornbusch, 1961). Their findings demonstrate that children today have a stronger preference for normal weight peers and dislike for overweight peers than their 1961 counterparts. Additionally, children prefer overweight peers even less than disabled peers (i.e., those in need of crutches or a wheelchair). Children also associate more negative adjectives with overweight peers (e.g., lazy, ugly, slow) than normal weight peers (Tiggemann & Anesbury, 2000; Penny & Haddock, 2007). Even parents stigmatize childhood obesity, as evidenced by 10% of participants in one study indicating a preference for a child with anorexia and 8% preferring a child with a learning disability over an obese child (Schwartz, Vartanian, Nosek, & Brownell, 2006).

In light of weight-related stigma and negative biases, it is not surprising that weight- and appearance-related teasing is reported more frequently by overweight and obese children (Hayden-Wade et al., 2005). Weight- and appearance-related teasing is associated with increased weight and shape concerns, body image disturbance, disturbed eating behaviors (restriction and bulimic symptomatology including binge-eating), and limited social interactions (e.g., preference for being alone and low interest in engaging in active behaviors) (Gibson et al., 2008; Hayden-Wade et al., 2005). Although results are mixed, there is some evidence that suggests high weight and shape concerns are related to greater incidence of depressive symptomatology in children as young as 8-years-old (Erickson, Robinson, Haydel, & Killen, 2000; Young-Hyman et al., 2006). The negative medical and psychosocial correlates of obesity have led many researchers to investigate the factors that contribute to the obesity epidemic in hopes of developing effective intervention and prevention strategies. Although etiological explorations have resulted in a

general consensus that genetic and environmental influences affect the onset and maintenance of obesity, much attention has been devoted to environmental factors given their observable and changeable properties and strong association with adiposity and BMI.

Environmental Risk Factors

The rates of overweight and obesity have increased steadily across all age ranges as tasty energy dense foods have become more readily and cheaply available and energy expenditure has decreased (Ogden et al., 2008). In light of the factors that contribute to the energy imbalance associated with obesity, terms like “toxic environment” (Horgen & Brownell, 2002) and “obesogenic environment” (Swinburn, Egger, & Raza, 1999) are used frequently to describe Western society. These terms characterize the overabundance of high-caloric and high-fat foods available in excessive portions and marketed for immediate consumption. These terms also reflect the increasingly prevalent lifestyles that are replete with sedentary rather than active behaviors.

Food Choice

According to the United States Department of Agriculture (2005), children’s daily food consumption should include 6 oz of grains (> 3 oz should be whole grain), 2 cups of vegetables (especially dark green and orange), 1.5 cups of fruit (100% fruit juice should be consumed in moderation), 3 cups of dairy (fat-free or low-fat; 2 cups for children 2- to 8-years-old), and 5 oz of protein (lean, low-fat, baked, broiled, or grilled). However, children typically fail to meet these guidelines (Ball, Benjamin, & Ward, 2008; Guenther, Dodd, Reedy, & Krebs-Smith, 2006; Fulgoni, 2008; Harnack, Walters, & Jacobs, 2003; Kranz & Wagstaff, 2007). Additionally, from 1998 to 2004, children 6- to 11-years-old exhibited a 20% increase in sugar-sweetened drink

consumption (Wang, Bleich, & Gortmaker, 2008). Wang and colleagues (2008) reported that rates of consumption of sugar-sweetened drinks tend to be higher in non-Caucasian children, which also is consistent with rates of obesity. These beverages account for 10-15% of children's daily caloric intake, are consumed primarily in the home, and consist primarily of regular sodas (Wang et al., 2008).

Fast food options also are popular with children and offer a number of energy dense foods (e.g., Robinson, Borzekowski, Matheson, & Kraemer, 2007). Fast food restaurants frequently are located around schools (Austin et al., 2005) and can even be found in hospitals (Cram, Nallamotheu, Fendrick, & Saint, 2002). Portion sizes also can influence the quantity of food children consume, with doubled portions resulting in children as young as 5-years-old eating up to 33% more than they would otherwise (Fisher, Liu, Birch, & Rolls, 2007). The same phenomenon is observed in adults (Wansink, 2010). Unfortunately, adults typically misinterpret their overeating as a result of hunger rather than environmental cues (e.g., a large bowl; Wansink & Sobal, 2007). As portion sizes of prepackaged foods (e.g., candy) and restaurant meals has increased (Fisher & Kral, 2008), consumption of energy dense foods is higher than ever before (Ayala et al., 2008). The USDA^a created an interactive online site (www.mypyramid.gov) for parents and children (specifically, 6- to 11-years-old) in an effort to increase knowledge of, and compliance with, dietary guidelines illustrated by the food pyramid. However, diet is only part of the energy imbalance contributing to the obesity epidemic. In addition to energy intake recommendations, the USDA also provides recommendations for energy expenditure.

Activity Level

Compounding the problem of increased energy consumption is the concurrent decrease in energy expenditure. A recent estimate suggests that only 42% of children ages 6- to 11-years-old participate in moderate to vigorous activity for the recommended 60 minutes per day (Troiano et al., 2008). Longitudinal and cross-sectional research indicate that energy expenditure decreases by more than 50% between childhood and adolescence and again between adolescence and adulthood (Nader, Bradley, Houts, McRitchie, & O'Brien, 2008; Troiano et al., 2008). Additionally, estimates suggest that nearly 75% of adults do not obtain the recommended amounts of physical activity (150 minutes of moderate activity or 90 minutes of vigorous activity per week) (CDC, 2001). To help ameliorate the problem with inactivity, the American Academy of Pediatrics (2001) recommends that children decrease sedentary behavior by watching a maximum of 1-2 hours of television per day. Children typically exceed this amount with estimates of 21 hours per week for children 4- to 17-years-old (Laurson et al., 2008; Pardee, Norman, Lustig, reud'homme & Schwimmer, 2007). Total screen time (television, computer time, and video games) is typically even higher (Laurson et al., 2008). Cross-sectional results are mixed regarding the association of increased television viewing and adiposity (Laurson et al., 2008). However, longitudinal data indicate that excessive television viewing (> 3 hours per day) at 7-years-old is predictive of increased adiposity and overweight BMI at 11-years-old (Davison, Marshall, & Birch, 2006). There is some evidence to suggest that increased screen time is associated with increased consumption of energy dense foods (e.g., Campbell, Crawford, & Ball, 2005; Taveras et al., 2006; Temple, Giacomelli, Roemmich, & Epstein, 2007). Video and electronic games are less clearly associated with obesity (e.g., Marshall, Biddle, Gorely,

Cameron, & Murdey, 2004; Stettler, Signer, & Suter, 2004), but it is indisputable that electronic gaming is a largely sedentary behavior. In reaction, gaming corporations have attempted to introduce a new generation of games that promote more active behavior (e.g., Wii Sports). Disappointingly, preliminary data suggest that these new games are still not vigorous enough to count toward exercise requirements for children and adolescents (Graves, Stratton, Ridgers, & Cable, 2007, 2008). Many young children also do not obtain enough moderate to vigorous activity at school – even during physical education classes (e.g. Fairclough & Stratton, 2006; Pate, McIver, Dowda, Brown, & Addy, 2008). However, recent evidence suggests that the home environment may be more responsible for BMI percentile gains than the school environment (Ramos & Barros, 2007; von Hippel, Powell, Downey, & Rowland, 2007).

Family Influences

Results of cross-sectional research suggest that frequent participation in family meal time may serve as a protective factor for a number of negative outcomes (e.g., early sexual activity, substance use, disordered eating behaviors, affective symptomatology) (Fulkerson et al., 2006). Children and adolescents tend to consume more healthy foods when they eat meals with their families (Feldman, Eisenberg, Neumark-Sztainer, & Story, 2007; Yuasa et al., 2008), and longitudinal data indicate that children who regularly eat meals with their family are less likely to become overweight or obese than those who do not (Sen, 2006). Despite all the positive associations with regular family meals, some parents may find mealtime to be less than a positive experience.

Parents of overweight children are significantly more likely to report mealtime conflicts than other parents (Zeller et al., 2007). They also are likely to report less family cohesion in

general and greater levels of depressive symptomatology (Zeller et al., 2007). Investigation of general parenting styles reveals that Authoritative parenting is associated with a host of positive child outcomes, including healthier diets (Arredondo et al., 2006; Hubs-Tait, Kennedy, Page, Topham, & Harrist, 2008; Patrick, Nicklas, Hughes, & Morales, 2005). Authoritative parents encourage autonomy and independence while warmly maintaining appropriate and consistent parent-child boundaries (Baumrind, 1971). There is evidence to suggest that overweight children are more likely to have a Permissive parent than an Authoritative parent (Wake, Nicholson, Hardy, & Smith, 2007; Hoerr, Hughes, Fisher, Nicklas, Liu, & Shewchuk, 2009). According to Baumrind (1971), Permissive parents allow their children to self-regulate and rarely, if ever, invoke parental rights to enforce rules. In contrast, Authoritarian parents are more likely to restrict their child's diet without consideration of the child's needs or desires, a practice that a recent review of the literature suggests may unintentionally promote the development of disturbed eating behavior (e.g., binge and purge behavior or unrestrained eating and related weight gain) (Rhee, 2008). Authoritarian parents, in general, are rigid in rule-making and enforcement and tend to be more punitive and less open to feedback compared to Authoritative parents (Baumrind, 1971). Parental restriction is more commonly observed in children who are overweight or obese (Fisher & Birch, 1999; Francis, Hofer, & Birch, 2001); however, it is unclear if this relationship is mediated by parenting style or is an artifact of some combination of factors including parental concern. Making desired foods (energy dense) contingent upon consumption of less desirable foods (nutrient dense) is another common parental tactic, but this strategy may result in excessive consumption regardless of hunger or satiety when the desired food is available (Rhee, 2008). Additionally, contingency practices may reduce intrinsic

motivation to consume and enjoy more healthful foods, an outcome that is in clear contrast to the desired effect (Carper, Fisher, & Birch, 2000; Fisher & Birch, 1999; Galloway, Fiorito, Francis, & Birch, 2006). Research suggests that it is more effective to engage in repeated exposure to healthy foods and increase their availability to promote child consumption and liking (for reviews, see Cooke, 2007; Ventura & Birch, 2008). In sum, children who are afforded opportunities to practice self-regulation, do not feel restricted, eat regularly with their parents, and have cohesive families appear to be at the least risk for being overweight. However, parenting styles and feeding practices are just part of the story. In addition to direct and active parenting behaviors, indirect factors also play a role.

One problematic factor that likely contributes to the childhood obesity problem is that close to half of parents with an overweight child do not recognize that their child's weight is out of the healthy range (Chaimovitz, Issenman, Moffat, & Persad, 2008; Mamun, McDermott, O'Callaghan, Najman, & Williams, 2008; Parry, Netuveli, Saxena, 2008; Tschamler, Conn, Cook, & Halterman, 2010). Another risk factor is parental obesity since parental BMI is highly predictive of child BMI (e.g., Agras, Hammer, McNicholas & Kraemer, 2004; Wake, Nicholson, Hardy, & Smith, 2007; Zeller et al., 2007). Similarly, there is a strong association between parent and child eating habits and activity level (for review, see Pugliese & Tinsley, 2007). For many overweight parents, childhood obesity interventions are especially challenging because they require changing their own eating and exercise behaviors while helping their children. This task may be particularly difficult for parents with an external locus of control and low self-efficacy, two factors that negatively affect adult weight loss success (e.g., Adolfsson, Andersson, Elofsson, Rossner, & Unden, 2005; Holt, Clark, & Kreuter, 2001).

Although parental modeling of healthy behaviors significantly affects children's engagement in healthful behaviors, positive parental modeling is not reliably effective for adolescents (see Jelalian, Wember, Bungeoth, & Birmaher, 2007). This finding further reinforces the necessity of early intervention at the familial level. Overall, parental change is considered a necessary component in childhood obesity interventions as those targeted exclusively at children usually fail to produce clinically significant improvements (Young et al., 2007). In fact, child-only interventions may increase engagement in restrictive eating patterns and bulimic symptomatology (O'Dea, 2007).

Childhood Obesity Interventions

A recent meta-analysis of randomized controlled trials indicated that the majority of studies targeted children 6- to 13-years-old and at least one parent. Most of the studies failed to report data for more than one follow-up. The lack of follow-up data prevents the evaluation of long-term treatment effects, which are of particular interest given overweight and obese children's propensity for adult obesity (e.g., Freedman et al., 2005). Despite the limitations of the current literature, meta-analytic findings (Wilfley et al., 2007) indicate support for treatment interventions compared to control groups immediately posttreatment and at reported follow-up (1 month to 5 years posttreatment). Intervention participants generally observe a decrease in their percentage overweight (~8-9%), whereas control participants generally report an increase (~2-3%). Overall, the results of the RCT meta-analysis by Wilfley and colleagues (2007) demonstrate that treatment is definitely better than no treatment. Additionally, other research suggests that family-based interventions produce the largest and most stable effects compared to child-only interventions (for meta-analysis, see Young et al., 2007). Several studies also have

demonstrated the superiority of targeting parents only (no direct child involvement) compared to child-only interventions (for review, see Golan, 2006). In particular, high parental involvement is associated with greater child weight loss post-treatment (Heinberg et al., 2010). Although parental involvement is considered the gold-standard for childhood interventions, there is no clear consensus on the content of interventions that yield the most efficacious outcomes.

Today, the vast majority of childhood obesity interventions focus on some combination of lifestyle changes (dietary and activity level). The Traffic Light Diet (TLD) is one of the most widely cited and studied interventions for childhood obesity (e.g., Epstein, Paluch, Kilanowski, & Raynor, 2004). Most contemporary TLD interventions teach children and parents separately about the nutritional content of various foods by categorizing them by colors of a stoplight (green [< 2 g fat & low calorie], yellow [2-5 g fat & medium calorie], and red [>5 g fat & high calorie]). Family members reduce caloric intake (800-1500 calories/day) and are encouraged to limit their red light foods over time (≤ 15 /week). Additionally, parents and children engage in self-monitoring activities (energy intake and expenditure) to increase self-awareness. Parents are encouraged to model appropriate healthful behaviors and provide reinforcement (rewards) and praise for child treatment adherence and/or goal attainment. Activity-related behavior changes are altered gradually (i.e., shaped), and are targeted via stimulus control (to reduce sedentary behavior) and/or reinforcement methods (to increase active behavior). Johnston and Steele (2006) conducted a 10-week TLD with 41 middle-class families with an overweight child aged 6- to 18-years-old. The intervention produced a clinically significant reduction in percent overweight (8%). Another study compared cognitive (thought monitoring and restructuring) and

behavioral (TLD) interventions and revealed further evidence for the support of the TLD (9% vs. 5% of overweight reduction, respectively) (Herrera, Johnston, & Steele, 2004).

Research indicates that the TLD is more effective when the focus is on what can be consumed (i.e., targeting increased fruit and vegetable consumption) rather than on what is prohibited (i.e., targeting decreased consumption of high fat and high sugar foods) (Epstein et al., 2001). Epstein and colleagues (2001) suggest that increases in nutrient dense foods can increase preference for healthier food options, increase satiation, and promote decreased consumption of more energy dense foods (high fat/high sugar). In contrast, targeting reduction of energy dense foods does not lead to increased consumption of nutrient dense foods. Similarly, targeting increased activity seems less effective than decreased sedentary behaviors (Espstein, Roemmich, Paluch, & Raynor, 2005). Epstein and colleagues (2001) suggest that feelings of deprivation or restriction play an important role in treatment success and likelihood of relapse. Therefore, targeting the energy imbalance in a way that allows children to maintain some control over their behavior is important for long-term efficacy. It is important to note that children, especially overweight children, are susceptible to replacing targeted sedentary behaviors (e.g., screen time) with other non-targeted sedentary behaviors. However, sex appears to moderate the relationship between sedentary behavior reduction and active behavior substitution with boys engaging in more active behaviors than girls (Epstein, Paluch, & Raynor, 2001). This finding suggests that interventions should be sensitive to sex differences and assist girls and their parents with identifying active behaviors that interest them. Additionally, parents of girls may need to focus more on the utilization of stimulus control to reduce the number of sedentary activities that are appealing and/or available.

Although the vast majority of childhood obesity interventions described in the literature are behavioral, they need not focus exclusively on the energy imbalance to achieve statistically and clinically significant results. For instance, a parent-only group intervention that utilizes an integrative framework is efficacious in reducing children's percentage of overweight (for review, see Golan, 2006). The intervention is delivered in a group format (14 sessions tapered at weeks 5 and 9) and is focused on healthy lifestyle changes rather than weight loss for children ages 6 to 11. The specific components include psychoeducation (food pyramid, lifestyle factors and activity level, obesogenic environment), motivational enhancement, and discussion of parenting (style, responsibility, and modeling), family interactions (mealtime conflicts & coping with resistance), body image, and relapse prevention. Results indicate a 15% decrease in percent overweight for children (compared to 8% for child-only group intervention). Follow-up data reveal parent-only intervention superiority at 1-year, 2-year, and even 7-year follow-up (Golan & Crow, 2004).

Treatment Modality

Group family-based interventions are more economical given that outcome data are comparable to individual family-based interventions (Goldfield, Epstein, Kilanowski, Paluch, & Kogut-Bossler, 2001). School-based interventions also are described within the literature but evidence supporting their efficacy is very limited (for review, see Shaya, Flores, Gbarayor, & Wang, 2008). One study found promising effects of a school-based intervention; however, results did not generalize to the home environment and positive results were not maintained during summer vacation (Carrel, Clark, Peterson, Eickhoff, & Allen, 2007). Evidence suggests that the efficacy of a school-based intervention is improved and treatment effects are maintained if parents are involved actively through psychoeducation and behavioral management training

(i.e., TLD) (Jiang et al., 2007). The work of Jiang and colleagues (2007) further emphasizes the need for parental intervention in preadolescent children.

Health or BMI report cards also have been used to increase parental awareness of their children's weight category and to provide tips to promote healthy lifestyles at the familial level (Chomitz, Collins, Kim, Kramer, & McGowan, 2003). However, this strategy is not very effective in motivating or increasing recommended changes (Evans & Sonnevile, 2009). In fact, nearly 20% of parents surveyed planned to place their child on a diet despite specific recommendations to reduce the energy imbalance for the entire family (Chomitz et al., 2003). The increase in dieting behavior associated with BMI report cards may lead to more harmful behaviors associated with disordered eating behaviors (Evans & Sonnevile, 2009). Chomitz and colleagues (2003) suggest that a single BMI report card mailing may not be salient enough and the content may be too generic to be effective.

Multi-week in-person interventions, group or individual, may be problematic for many families to attend and BMI report cards sent home by schools have been ineffective thus far in affecting change. To combat these problems, researchers have turned to the internet as a forum for treatment. Results of family-based online behavioral interventions offer promising results immediately post-treatment compared to control conditions (free health tip websites), but follow-ups reveal a failure to maintain treatment gains (i.e., decreased percentage overweight) (Thompson, Baranowski, Cullen, & Baranowski, 2005; Williamson et al., 2006). To date, published studies have only evaluated treatment outcomes in African American girls. Additionally, studies have required some in-person participation as well as a multi-week commitment to the online intervention. As with in-person studies (Golan, Kaufman, & Shahar,

2006), treatment participation appears to play a role in online outcomes with greater participation yielding better results (Williamson et al., 2006). In one 8-week family-based online intervention, login rates were variable and lower than desired (baseline of 83% declined to 55% in week 2; mean time spent online = 13 minutes; Cullen & Thompson, 2008). In general, the sample sizes in published family-based online studies are quite small (final $N < 40$; Thompson et al., 2005; Williamson et al., 2006; Cullen & Thompson, 2008), so it is possible that available results underestimate the utility of online interventions given that no study has achieved adequate power to detect significant differences between groups. In light of the fact that, similar to in-person interventions, online studies have experienced difficulties with consistent participation and attrition, it seems that factors such as distance and travel expense might play less of a role than previously thought. It is more likely that required time and perceived helpfulness of the intervention contribute to one's decision to enroll and participate in a family-based treatment, online or in-person.

Overall, small and inadequate samples are likely due to recruitment difficulties and attrition rather than lack of researcher efforts (Warren et al., 2007). Warren and colleagues (2007) reported that the recruitment of 85 to 110 children in 3 in-person studies required significant efforts that involved researchers working at night and on weekends, making multiple contacts with parents (email, telephone, and post service), and recruiting for more than one year. Each cohort ($n = 15-20$) took 6 to 8 weeks to recruit. Of those recruited, 36% of parent-only, 18% of parent-child, and 15% of child-only participants dropped out prior to the first session. The pre-commencement attrition rates suggest that it is likely beneficial to obtain parental "buy-

in” even before the first session if their child is not going to be directly targeted. It might also suggest that some parents are unwilling or insecure in their ability to affect change.

Concerns about the ability to successfully manage diet and exercise are parallel to issues that commonly arise during the course of substance abuse treatment, and researchers suggest that substance interventions may be efficacious in the treatment of childhood obesity (Acosta, Manubay, & Levin, 2008). In particular, brief nonjudgmental approaches designed for use with substance patients show promise with parents of overweight children (Schwartz et al., 2007). Tailored or personalized treatment that meets parents “where they are” in terms of readiness to change is another method that may reduce attrition and promote treatment adherence.

Theoretical Foundations

To better explore one’s readiness to change, researchers utilize the Transtheoretical Model (TTM), which is an integrative process-oriented model often used as a complementary or adjunctive intervention approach to behavioral and cognitive-behavioral treatments (Prochaska, 2006). The Transtheoretical Model posits that individuals who are faced with making a change move through five stages: precontemplation, contemplation, preparation, action, and maintenance (DiClemente & Prochaska, 1982). In Precontemplation, the individual has not considered change and has no plans to change in the next six months, whereas someone in the Contemplation stage is considering making a change within the next six months. A person in the Preparation stage plans to make a change in the next month, and an individual in the Action stage has successfully made a change within the past six months. Finally, designation of the Maintenance stage signifies that a person has made a change for more than six months. It is possible for people to move between stages and relapse to an earlier stage (see Redding et al.,

1999). The model also addresses self-efficacy and decisional balance (pros/cons) (e.g., Prochaska & Diclemente, 1984). Self-efficacy, or individuals' confidence in their abilities, increases and pros outweigh cons as people move linearly through the stages (e.g., from Contemplation to Action). The premise of TTM is that individuals should be treated in the context of their readiness to change (for review, see Redding et al., 1999). Accordingly, clinicians utilizing TTM choose from ten specific processes associated with stages of change treatment: consciousness raising, dramatic relief, environmental reevaluation, emotional release, emotional reevaluation, self-reevaluation, self-liberation, contingency management, helping relationships, counterconditioning, and stimulus control.

Although TTM originally was applied in substance interventions, its usefulness has been demonstrated across a range of health behaviors including weight management (e.g., Chang, 2007; Prochaska et al., 2005). With regard to adult weight management, researchers have validated reliable TTM measures related to diet and exercise (e.g., Sarkin, Johnson, Prochaska, & Prochaska, 2001). Researchers have also demonstrated the short-term efficacy of TTM-based interventions using the Internet for physical activity promotion (Napolitano, Fotheringham, Tate, Sciamanna, Leslie, Owen, Bauman, & Marcus, 2003). TTM also has been applied to work with younger populations. For example, Di Noia, Contento, and Prochaska (2008) reported that children (11- to 14-years-old) who received 4 online sessions that were personalized in the context of their stage of change were more likely to increase their consumption of nutrient dense foods compared with children in a control group. Researchers have also demonstrated the utility of using stage-based recommendations for fruit and vegetable intake for parents of preschool-age children (Hildebrand & Betts, 2009). Additionally, Howard (2007) proposed an obesity-specific

stage chart that includes treatment recommendations associated with the ten processes, but this work has not been empirically evaluated.

As with many theories, researchers have documented criticism of TTM (for review, see Wilson & Schlam, 2004). Specifically, critics take issue with the discrete categorization of stages because they note that it is possible for individuals to endorse behaviors that cross-over stages. Additionally, critics question the appropriateness of basing choices of treatment options on stages given the mixed evidence regarding the variance accounted for by identified stage in treatment outcomes. Despite the criticisms of TTM, stage of change is still widely assessed and utilized in research and clinical practice. Recently, Prochaska, Wright, and Velicer (2008) addressed concerns related to the TTM and provided evidence in support of its use in theory and practice.

Although the TTM helps to tailor treatment components based on one's readiness to change (i.e., it does not set one up for failure nor does it implement unnecessary treatment steps), it does not fully address the feelings of incompetence or resistance that one might experience during a lifestyle change intervention. Motivational Interviewing (MI) is a technique that frequently is used to help individuals resolve ambivalence regarding treatment and is considered to be an effective treatment for weight reduction and substance abuse (for review, see Rubak, Sandbaek, Lauritzen, & Christensen, 2005). MI is a brief, client-centered, non-judgmental approach to behavior change (Miller & Rollnick, 1991, 2002). MI is similar to the TTM in that it seeks to meet people where they are in terms of change (Rollnick, Miller, & Butler, 2008). In the spirit of MI, clinicians "roll with resistance" and do not actively impose change (Miller & Rollnick, 1991, 2002). MI may be especially useful in weight management interventions since

feelings of deprivation and engagement in behaviors perceived as forced are related to poor outcomes (Epstein, Roemmich, Paluch, & Raynor, 2005). The brevity of MI intervention has afforded application in physician offices, the first place overweight or obesity usually is formally identified, and studies offer promising results (e.g., Resnicow, Davis, & Rollnick, 2006; Schwartz et al., 2007; Sindelar, Abrantes, Hart, Lewander, & Spirito, 2004). Schwartz and colleagues (2007) evaluated the efficacy of pediatrician and dietician delivered MI interventions with parents of 3- to 7-year-olds compared to a control condition. Posttest results indicated a 2% overweight decrease for a 1-session brief pediatrician delivered intervention, and a 3% decrease for a 2-session pediatrician and dietician intervention. The control group experienced a decrease of less than 1%. It is important to note that the Schwartz study experienced significant attrition that resulted in small and unequal cell sizes (range = 15 to 27), similar to other studies. The decrease associated with MI is impressive given that more traditional interventions that yield an average of 8% reductions are significantly longer and more intensive.

Many studies utilize an integrated theoretical framework to maximize desired outcomes. For example, the TTM is frequently used in combination with Social Cognitive Theory (SCT; Bandura, 1986; Bandura, 1992). SCT, like the TTM, emphasizes individual behavior change and the importance of self-efficacy, or confidence in changing behavior. Interventions influenced by SCT also emphasize increasing knowledge, goal setting, enhancing motivation (and self-regulatory processes), facilitating change, and identifying barriers to change and plans to overcome them (Bandura, 1986; Bandura, 1992). SCT also acknowledges the social aspect of change that can arise from modeling within various systems, including families.

TTM and MI have been utilized in combination with the delivery of personalized feedback, which has been demonstrated to be efficacious in substance use interventions (e.g., Drinkers Check-Up; Agostinelli, Brown and Miller, 1995). Motivationally-tailored feedback based on SCT and TTM has also been shown to be effective in increasing physical activity (Marcus et al., 2007^a; Marcus et al., 2007^b; Napolitano et al., 2006; King et al., 2007) and fruit and vegetable consumption (de Vries, Kremers, Smeets, Brug, & Eijmael, 2008; Kristal, Curry, Shattuck, Feng, & Li, 2000) among adults. Several studies have determined that the provision of personalized feedback, which has the potential to increase motivation to change (Bendtsen, Johansson, & Akerlind, 2006), is effective for reducing cannabis use (e.g., Stephens, Roffman, Fearer, Williams, & Burke, 2007), depressive symptomatology (e.g., Geisner, Neighbors, Larimer, 2006), and bulimic symptomatology (Schmidt et al., 2006). The content of tailored feedback varies from study to study, but most include psychoeducation, normative comparisons, information about risk level (e.g., alcohol-related harms), attitudes about the behavior (how you view your behavior), and tips for change and engagement in more healthful behaviors (Walters, Miller, Chiauzzi, 2005). Agostinelli and colleagues (1995) note that feedback delivered with MI is more effective than other styles. The immediate effects of contemporary online feedback delivery systems for alcohol use (e.g., electronic “Check-up to Go”) also are promising, demonstrating reduction in peak blood alcohol content and frequency of drinking (Walters, Van Sickle, & Moyer, 2004). Currently, a TTM-based online personalized feedback website focused on diet and exercise is being evaluated for adolescents (Mauriello et al., 2006). Mauriello and colleagues (2006) are hopeful that it will be as effective in reducing energy imbalance as a similar program developed for bullying has been in reducing incidence by 30-40%. Despite its

success with adults, tailored feedback is understudied with regard to pediatric weight management. In fact, to date, only one recent study has evaluated the efficacy of motivationally-tailored feedback delivered to parents (i.e., Chen, Weiss, Heyman, Vittinghoff, & Lustig, 2008).

Chen and colleagues (2008) asked children (ages 8-10 years old) and their parents to complete measures related to physical activity, typical dietary choices, and nutrition and physical activity recommendation knowledge. They delivered motivationally-tailored feedback via regular U.S. postal mail within two weeks of baseline completion to a small sample ($n=42$) of parents of Asian-American children. Results of this uncontrolled study revealed significant changes in children's physical activity, general food choices, and knowledge of nutrition and physical activity recommendations at 1 month and 6 month follow-ups. Additionally, at the 6 month follow-up, a decline in BMI was observed for children who were overweight at baseline. This study suggests that a one-time motivationally-tailored feedback mailing may be effective in promoting change among children. However, no study, to our knowledge, has conducted a controlled evaluation of this type of intervention with children and parents.

Current Study

Collectively, review of the relevant literature reveals a dire need for effective intervention and prevention strategies that are easily delivered given that 33% of children 6- to 11-years-old are overweight and 15% are obese (Ogden et al., 2008). Currently available in-person and online family-based interventions typically experience significant attrition, possibly due in part to the time commitment required. Therefore, the aim of the current study was to further address the need for effective brief family-based interventions focused on the achievement of healthy lifestyles and corresponding weights. To this end, the current study focused on the development

and evaluation of the effects of a single motivationally-tailored family-based feedback program e-mailed to parents of children aged 6- to 11-years-old and delivered in the context of the TTM and in the spirit of MI. The integrated theoretical framework also capitalizes on the strengths of SCT in its focus on self-efficacy and parental modeling, as well as its use of therapeutic tools like a decisional balance. The current application has the potential to reach many families quickly and economically – many of whom might not even realize their child is overweight (e.g., Chaimovitz et al., 2008; Tschamler, Conn, Cook, & Halterman, 2010).

Feedback consisted of charts illustrating how closely children and their parents adhere to recommended nutritional intake and energy expenditure guidelines. Additionally, the feedback report included information about family members' BMI and weight status. Parents also received feedback about their stage of change, parenting style, feeding practices, and mealtime interactions. The TTM was used to guide the type of behavioral suggestions and tips provided, and each family received psychoeducational material about the energy imbalance. MI delivery was made possible through the presentation of feedback and in the incorporation of responses to a series of open-ended questions that promote parental contemplation and provide additional information about each individual family. A control group was utilized to assess the efficacy of the proposed intervention. Parents in the control group received information about the free USDA-sponsored website, mypyramid.gov.

Compared to control parents at one month follow-up, it was hypothesized that parents receiving motivationally-tailored feedback would report:

1. greater decreases in their child's engagement in sedentary behaviors
2. greater decreases in their own engagement in sedentary behaviors

3. greater number of family lifestyle changes (e.g., using stairs instead of the elevator, parking farther away from entrances, etc.) and increases in active behavior.
4. greater increases in their child's consumption of nutrient dense foods
5. greater increases in their own consumption of nutrient dense foods
6. greater decreases in their child's consumption of energy dense foods
7. greater decreases in their own consumption of energy dense foods
8. fewer occasions of eating out at restaurants (fast-food)

Additionally, several exploratory analyses were conducted to investigate the effect of stage of change, frequency of family meals, mealtime interactions, parental feeding practices, and parenting style on participant outcomes. Given the relatively short time period between intervention and follow-up, weight loss was not anticipated.

CHAPTER 3: METHODOLOGY

Participants

As recommended by Cohen (1992), a power of .80 and an alpha of .05 was used. A meta-analysis by Young and colleagues (2007) determined that family-based interventions that utilize behavioral methods yield large effect sizes. However, in light of the novel approach, a medium effect size was projected. Accordingly, G*Power3 (Faul, Erdfelder, Lang, & Buchner, 2007) recommended a total sample size of 66.

Although a total of 214 participants were recruited, final baseline participants were 132 parents of children 6 to 11 years old (31 provided email addresses but never started baseline measures, 48 began but did not complete baseline measures, and 3 provided consent but did not

begin baseline). Of the 132 baseline participants, 100 participated at follow-up (of which 91 submitted complete follow-up measures; see Figure 1 for flowchart). Analyses of all independent variables were conducted to evaluate for differences between individuals who completed the study and those who did not. Chi square analyses failed to reveal any differences related to demographic variables such as sex, race, income, and dieting status. Results of an independent samples t-test approached significance and indicated that parents who did not participate at follow-up ($n=32$) may have had a higher mean BMI ($M=29.09$, $SD=7.00$) than parents who participated at both time points ($M=26.38$, $SD=6.92$), $t(129) = -1.90$, $p = .06$. Parents who completed follow-up were more likely to score higher on the Autonomy Granting Dimension, $t(127) = 3.26$, $p = .001$, and Authoritative Parenting Style, $t(121) = 2.15$, $p = .03$, subscales of the PDSQ, and lower on the Nonreasoning/Punitive Dimension subscale of the PDSQ, $t(125) = -2.82$, $p = .001$.

Parents were primarily mothers (96.9%), Caucasian (80.4%; 6.1% Hispanic, 4.5% African American, 4.5% Asian, and 4.5% Bi/Multi-racial), and married (83.7%; 7% single, 6.2% separated/divorced, and 3.1% living with partner). Participants were recruited from 31 states (32.8% from Florida), and household income ranges varied (4.6% earned <\$25,000, 14.6% earned \$25,001-\$40,000, 15.4% earned \$40,001-\$55,000, 17.7% earned \$55,001-\$70,000, 15.4% earned \$70,001-\$85,000, 14.6% earned \$85,001-\$100,000, and 17.7% earned >\$100,000). The mean age was 36.27(5.76), and the mean BMI was 27.02(7.01) (44.3% normal weight, 29% overweight, 25.2% obese, and 1.5% underweight). Children were primarily female (57.6%), Caucasian (81.4%; 7.8% Bi/Multi-racial, 5.4% Hispanic, 3.9% African American, and 1.5% Asian), and of normal weight (59.9%; 15.7% obese, 14.2% overweight, and 10.2% underweight).

Recruitment

Participants were recruited via a myriad of outlets (e.g., Good Morning UCF Newsletter, physician offices, local elementary schools parent emails, word-of-mouth/forwarded e-mails, blogs, Facebook group posts, Facebook status posts, and listserv emailngs; see Appendix B for recruitment examples). Study enrollment varied dramatically during the recruitment period (approximately 9 months). It is estimated that at least 2,000 parents with children in the study age range were exposed to the study announcement. For example, three Sports Psychology listservs (including APA Division 47) have a combined total of 1400 members. Additionally, parents from Aloma Elementary School (enrollment=546), Fern Creek Elementary School (enrollment=431), Pineloch Elementary School (enrollment=540), and the Waterford Elementary School PTA board ($n=20$) received e-mail forwards from school principals. Facebook parenting groups and health-focused groups ($N=20$) had 50 to > 25,000 members. Finally, Facebook status posts (>10 individual accounts), posts to non-parenting and health-focused Facebook groups ($N=3$), and multiple emails were forwarded from more than 20 individuals (colleagues, friends, and family members of the primary researcher or other professionals) to identified parents with children in the study age range (and other individuals [e.g., teachers] who had access to parents of children in the identified age range. The individuals reported emailing at least 2 to more than 60 parents or other individuals.

Due to low enrollment (5-7 participants per month) and frequent baseline attrition (generally occurring at the food record), monetary compensation (\$10 gift card at baseline and \$10 gift card at follow-up) was added. Compensation was associated with quintupled enrollment each month thereafter. Additionally, more than 100 parents began the study after it was posted

on a nationally popular parent blog (moneysavingmom.com). Evaluation of these participants revealed that a number of them were stay-at-home moms. All participant responses were carefully evaluated, and blog participants appeared to provide thoughtful, valid information. Despite the monetary compensation, many participants commented on their interest in receiving personalized feedback and making health-related changes. These comments suggest that the study topic may have been at least as influential as the monetary compensation. Overall, 52.3% of participants were recruited from blog and parenting group posts (25.8% email, 10.6% Good Morning UCF, 9.8% Facebook status posts, 0.8% pediatrician/dentist, and 0.8% gym).

Measures

1. *The Child Feeding Questionnaire* (CFQ; Birch, Fisher, Grimm-Thomas, Markey, Sawyer, Johnson, 2001; see Appendix C) – The CFQ is a 31-item, 7-factor measure used to evaluate parental perceptions of their perceived responsibility for their child’s eating, feeding practices (restriction, pressure to eat, food monitoring), and concerns regarding the risk for obesity. Additionally, the CFQ assesses parental perception of their weight and the weight of their child. The researchers established adequate internal consistency for each factor ($\alpha > .70$) with parents of children 2- to 11-years-old in three separate studies. The current study produced comparable internal consistency estimates for most measures (Perceived Responsibility $\alpha = .67$, Concern about Child Weight $\alpha = .90$, Restriction subscales 1, 2, & 3 $\alpha > .75$, Pressure to Eat $\alpha = .60$, Monitoring $\alpha = .88$)
2. *About Your Child’s Eating – Revised* (AYCE-R; Davies, Noll, Davies, & Bukowski, 1993, Davies, Ackerman, Davies, Vannatta, & Noll, 2007; see Appendix D) – The AYCE-R is a 20-item, 3-factor measure that evaluates parent/caregiver beliefs and concerns about

children's eating and family mealtime interactions (Child Resistance to Eating [CRE], Positive Mealtime Environment [PME], & Parent Aversion to Mealtime [PAM]). The AYCE-R was standardized on parents of children 8- to 16-years-old. The original sample data resulted in adequate internal consistency for each factor ($\alpha > .70$) and convergent validity with the Family Environment Scale (Moos & Moos, 1981). Internal consistency using the current sample was also adequate (CRE $\alpha = .84$; PME $\alpha = .81$; and PAM $\alpha = .81$). Higher scores on the CRE and PAM indicate more parent/child distress, whereas lower scores on the PME are indicative of a more negative mealtime environment. Davies et al., (2007) provided clinical cutoff scores for each subscale.

3. The modified version of the *Parenting Styles and Dimensions Questionnaire* (PSDQ; Robinson, Mandleco, Olsen, & Hart, 2001; see Appendix E) is a 32-item measure that assesses parenting style based on Baumrind's typology (Authoritative, Authoritarian, & Permissive). Robinson and colleagues report adequate internal consistency ($\alpha > .80$) for the Authoritarian and Authoritative subscales (the current sample yielded $\alpha = .72$ and $\alpha = .84$, respectively). Adequate internal consistency was not established for the Permissive subscale in the original sample ($\alpha = .64$); however, the current sample yielded $\alpha = .75$.
4. *24 Hour Food Recall* – The food recall log was created for the purposes of this study and is an adapted version of the 24-hour food recall surveys typically used by dietitians (e.g., USDA^b; see Appendix F). Parent participants recalled and listed information about food consumed by their child and themselves for the previous 24 hours. Parents also rated their confidence in the accuracy and completeness of their recall, the general representativeness of the EIR, and satisfaction with reported energy intake. Parents who indicated that the

previous day was not representative of their typical diet were asked to provide an example of what they and their child “typically” eat instead. Finally, intervention condition parents who were dissatisfied with their report for themselves and/or their child provided information about what they would like to change.

5. *Physical Activity and Fruit/Vegetable Stage of Change Measures* (adapted from the Smoking: Stage of Change measure created by DiClemente et al., 1991; see Appendix G)
 - Parents completed two stage of change measures for themselves and their child, for a total of four assessments. The measures categorize parents’ readiness to change in one of five stages based on response choice (e.g., “No, and I do not intend to in the next 6 months”). Parents provided information regarding physical activity and fruits/vegetables separately.
6. *Physical Activity Self-Efficacy and Fruit/Vegetable Self-Efficacy (PASE and FVSE;* adapted from Marcus, Selby, Niaura, & Rossi, 1992; see Appendix H). Parents provided ratings of self-efficacy, or their confidence in their abilities to make healthy decisions for themselves and their child in general and under various levels of stress and time constraints. The PASE has two subscales (6-item PASE-parent and 5-item PASE-child), confirmed by Principal Components Analysis using a Varimax rotation (all items loaded at .6 or higher). Both PASE subscales have good internal consistency (parent $\alpha = .88$; child $\alpha = .90$). Principal Components Analysis using a Varimax rotation indicated that the FVSE is a single 11-item measure with good internal consistency ($\alpha = .94$). All items on the FVSE loaded at .6 or higher. The FVSE evaluates aspects of parents own self-efficacy for eating and self-efficacy for feeding their family fruits and vegetables.

7. Physical Activity Survey (see Appendix I). Study participants provide estimates of the total number of days and time they and their child are engaged in physical activity. Participants also provided examples of the type of activity in which they engage to determine moderate vs. intense physical activity.
8. Decisional Balance Exercise (Miller & Rollnick, 1991; See Appendix J). – The DBE is a brief worksheet that helps individuals to identify the pros and cons of a specific behavior change. It is designed to help individuals recognize ambivalence and begin to think about the factors associated with behavior change. The DBE was adapted for this study and completed by intervention participants only.
9. *Demographic Questionnaire* (see Appendix K). Study participants will provide information about their child and family members (sex, socioeconomic status, frequency of family meals, frequency of fast food consumption, most frequently ordered fast foods, frequency of eating at home vs. eating at restaurants other than fast food restaurants, and consumption of a variety of beverages). A 30-item likert-scale questionnaire developed for the purposes of this study provides information about parents' factual knowledge about healthy living, desire to learn more about healthy living, and satisfaction with, beliefs about, and perceptions of their family's lifestyle. Parents enrolled in the intervention condition also were asked to provide responses to a series of open-ended questions related to their perceptions of their family's health-related behaviors.
10. *Body Mass Index* (BMI; Center for Disease Control) – Formula: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$; for children, BMI percentiles will be used. In-person measurement of height and weight is considered the gold-standard due to concerns about misreporting, just like with

adult and adolescent self-reports (Akinbami & Ogden, 2009). However, some researchers suggest that parental estimates of child height and weight may be acceptable alternative to in-person measurements (Banach et al., 2007; Krieser et al., 2007). Given the nature of this study (an online initial feasibility and efficacy trial), BMI will be calculated using self-report data as it mirrors the real-world application of the developed program.

Pilot Testing

After receiving approval from the Institutional Review Board at the University of Central Florida (see Appendix L), 10 individuals participated in pilot testing that allowed for initial usability testing and refinement of the program. Feedback received from pilot participants informed modifications of the baseline survey and presentation of feedback. Participant responses also prompted problem-solving related to food record calculations including the creation of “default” nutrition data (e.g., portion sizes and other information to use for entry in the mypyramid.gov food tracker system (see Figure 2) when participants provided vague data like “a handful of chips”) and the refinement of the online food recall survey.

The primary researcher and two research assistants utilized pilot data to practice using the mypyramid.gov food entry system (mypyramid tracker). Several pilot participants provided multiple food records due to initial difficulties with missing or vague data (e.g., “a bowl of cereal,” “a splash of milk,” “a glass of juice”). Due to these difficulties, literature reviews from a variety of fields were conducted to identify “average” portion sizes for children and adults to replace the unanticipated missing data (despite several prompts and examples provided to encourage specificity). Additionally, five research assistants measured their own servings (e.g., cereal and milk), pouring “a splash,” and grabbing a “handful” of chips.

Finally, the website www.calorieking.com, individual manufacturer websites (e.g., Kraft.com), and individual restaurant websites (e.g., www.mcdonalds.com) were used to determine missing serving sizes. The primary product website was consulted first, whereas calorieking.com was utilized if the primary product website did not contain the needed information (for example, Chili's does not provide nutritional information on their website). A database with this information was created so that it could be readily accessed as needed. To promote more complete food record data, portion size examples were added as well as several examples of records illustrating a variety of foods and the desired specificity (see Figure 3 for example) These additions did not result in more complete or more detailed records.

Additional refinements focused on reducing participant burden. In particular, feedback about the time required to complete baseline and original follow-up measures was a point of contention among all pilot participants. Based on their feedback, the 29-item *Family Eating and Activity Habits Questionnaire* (FEAH; Golan & Weizman, 1998; see Appendix M) was removed because the items were redundant to others included in the survey. This reduced the completion time from 70-85 minutes to an average of 60 minutes. Additionally, the follow-up survey was reduced to promote increased participant retention. In particular, the CFQ, the AYCE, and 26 items from the questionnaire developed to assess parents' factual knowledge about healthy living, desire to learn more about healthy living, and satisfaction with, beliefs about, and perceptions of their family's lifestyle were removed. These measures and items were not related to any of the main study hypotheses. The removal of these measures and items reduced the completion time from an average of 60 minutes to an average of 30

minutes. Even with the removal of items from baseline and follow-up, many enrolled participants continued to comment on the time burden.

Finally, initial pilot participants provided feedback regarding the intervention materials. Based on their comments, feedback reports were streamlined using more charts, graphs, and other illustrations to promote interest (see Appendix N for example report). Text for each topic was limited to one page or less in most cases (food record data for child and parent were illustrated using charts over two pages, and related recommendations were presented on a separate page). Additionally, psychoeducation was moved to the bottom of most pages to ensure that parents were more likely to see and read their tailored feedback first.

Procedure

Parents provided informed consent (Appendix O) and participated online via a secured website (www.surveymonkey.com). All participants were informed that they would be asked to participate in a follow-up approximately 4 weeks from the date of their participation. They also received information about random assignment. Participants provided contact information for follow-up and intervention delivery, and they also provided consent to allow researchers to contact them to ensure that they received feedback and/or to remind them to complete the study follow-up. All participants were informed of their right to withdraw their consent to participate at any time without penalty. Participants received a \$10 gift card to Target or Wal-Mart at baseline and follow-up (for a total of \$20). To maintain participant confidentiality, parents answered a series of questions that were used to link their data and contact information (parent birth month, parent birth year, oldest child birth month, first three letters of oldest child's last name, and first two letters of parent's first name).

Participants were asked to participate only when they had at least 60 minutes to complete the baseline survey. Only one parent or guardian per family was eligible to participate. Parents with more than one child in the specified age range were asked to think of the child for whom they had the most concern related to weight or healthy eating. In cases where parents did not have any concerns about any of their children, they were asked to simply choose one child to keep in mind. Parents were reminded of the chosen child at follow-up to ensure data were obtained for the same child. Parents were eligible to participate regardless of their child's weight status.

Random assignment was achieved by automatically routing participants to their condition based on the first letter of their last name (i.e., A-H = control; I-Z = intervention). The researcher reversed the routing assignment twice per week (i.e., A-H = intervention; I-Z = control). Control participants completed all measures and items described previously except open-ended MI questions and a decisional balance. Intervention participants completed all of the measures described previously including open-ended MI questions and a decisional balance. Upon completion of the study, participants received a debriefing form. The debriefing included basic information about the obesogenic environment and the energy imbalance that leads to increased risk for adiposity and unhealthy BMI. Parents also received information about the USDA website (www.mypyramid.gov).

Intervention participants received motivationally-tailored feedback delivered via e-mail within two weeks of participation. Intervention participants were asked to confirm receipt of the document. Participants were contacted if they did not respond within 48 hours. Tailored feedback included information parent and child BMI, physical activity, screen time, dietary

intake, stage of change, parenting style, and family mealtimes. Recommendations were chosen based on participant results (including the decisional balance exercise), and were guided by the TTM (i.e., participant stage). Parents were encouraged to make all changes at a familial level, and relevant examples were provided.

All participants received an e-mail with a link to the follow-up survey that included questions related to any lifestyle changes that they or their family made since their initial participation, as well as the Stage of Change and Self-Efficacy measures. Participants also completed items related to physical activity and a food recall log. Intervention participants were asked to rate how thoroughly they reviewed their personalized feedback, their perception of the impact of the personalized feedback, and their perception of the importance of the feedback in any changes they made over the course of the previous 30 days. They also indicated if they would recommend the program to other parents, and they provided information about what they liked most, liked least, and what they would suggest changing (see Appendix P). Control participants also provided feedback about their participation (see Appendix Q). Participants received a reminder e-mail to complete the follow-up survey if they did not complete it within five days. Additionally, participants who failed to complete the survey within ten days received a reminder phone call. Participants received a debriefing form at the conclusion of the study (see Appendix R).

CHAPTER FOUR: RESULTS

Data Screening

All variables were screened for skewness, kurtosis, outliers, and homogeneity of variance using Levene's test. Outliers were excluded appropriately from relevant analyses. Attempts to

transform non-normally distributed data using square root and logarithmic transformations were not consistently effective. Additionally, effectively transformed data did not yield different results. This is not unexpected given that the statistical analyses presented below are generally robust and not always sensitive to issues related to normality when group sizes are equal (Tabachnick & Fidell, 2001). Therefore, data presented are untransformed. Control and intervention groups were compared using independent t-tests and chi-square analyses to ensure that no significant differences in demographics existed at baseline (see Table 1). To maximize power, partially completed follow-up surveys were retained.

Descriptive Data

Frequency analyses were conducted to evaluate the occurrence of various behaviors in the current sample.

Weight

More than half of parents were overweight (29.0%) or obese (25.2%). The remaining parents were of normal weight (44.3%) or were underweight (1.5%). Nearly three-quarters of parents wished to lose weight (73.5%) and nearly one-quarter were currently dieting to lose weight (24.2%). Another quarter of parents indicated that they hoped to maintain their weight (25.8%), and a single parent reported that they wanted to gain weight (0.8%). The majority of parents indicated that they were confident in their estimates of their child's height (93.2%) and weight (97.7%). The majority of children were of normal weight (59.9%), and the majority of parents wanted their child to maintain their weight (69.6%). A similar number of children fell in the overweight (14.2%) or obese (15.7%) categories, and 10.2% of children were classified as

underweight. Parents wishing for their child to lose weight (15.2%) equaled that of parents wishing for their child to gain weight (15.2%).

Sedentary Behavior

Watching television accounted for the most time spent engaged in sedentary behavior for children ($M=10.83$ hours per week, $SD=8.71$; range: 0-60), followed by video games ($M=3.78$ hours per week, $SD=5.74$; range: 0-41) and computer time ($M=3.48$ hours per week, $SD=4$; range: 0-25). Total mean screen time for children was 18.1 hours per week (13.89) (range: 0-86 hours per week). For parents, computer time accounted for the greatest amount of time engaged in sedentary behavior ($M=19.94$ hours per week, $SD=16.3$; range: 1-120). Parent television time was comparable to children's ($M=11.33$ hours per week, $SD=9.88$; range: 0-72), and very few parents reported high rates of video game play ($M=0.59$ hours per week, $SD=1.69$; range: 0-10). Average total screen time for parents was approximately 30 hours per week ($M=30.86$, $SD=22.19$; range: 2-192).

Physical Activity

More than half of parents reported that their job was sedentary (57%); however, the majority of parents reported being physically active throughout the week (mean number of active days = 4.13($SD=1.92$; range: 0-7). Most parents (84.8%) also reported that they met or exceeded weekly physical activity recommendations of 150 minutes or 2.5 hours per week ($M=8.86$, $SD=11.62$; range: 0-70). Despite these reported estimates, 40.2% of parents did not classify themselves as meeting recommendations on a physical activity stage of change measure (PASOC-P). Children were also reported to be active more days than not throughout the week, with 52.3% being physically active daily ($M=5.82$, $SD=1.58$; range: 0-7) for an average of 12.2

hours per week ($SD=7.34$; range: 0-35). Overall, three-quarters (75.8%) of children met physical activity guidelines and recommendations based on parental estimates. However, 80.1% of parents classified their child as meeting recommendations on a stage of change measure (PASOC-C) (See Figure 4).

Dietary Behaviors

Children ate fast food (e.g., McDonald's) or casual dining food (e.g., Chili's) an average of once per week (48.9%; $M=1.35$, $SD=1.09$; range: 0-6). Most parents also reported eating at a fast food or casual dining restaurant once per week (46.17%; $M=1.67$, $SD=1.45$; range: 0-6). Parents cited time (51.2%; "it's fast") and convenience (35.8%; "it's easy") most frequently as reasons for eating fast food. In addition to convenience (43.2%), parents cited time (22%) and taste (22%; "it's tasty") as reasons for casual dining visits (See Figures 5 and 6).

The most commonly consumed beverage for children (45.7%) and parents (58.8%) was water. Milk (24%) and juice (19.4%) rounded out the top three drinks for children, whereas diet soda (13.7%) and iced tea with real sugar (9.2%) were among the most popular for parents. Only 2.3% of children and 6.1% of adults chose regular soda most frequently.

Results of the fruit and vegetable stage of change measure (FVSOC) indicated that 61.0% of parents and 63.0% of children met daily fruit and vegetable intake recommendations. In contrast, based on food record data, only 30.8% of parents and 45.8% of children ate the recommended 1.5 cups of fruit per day. Additionally, only 27.4% of parents and 12.1% of children ate the recommended 2 cups of vegetables per day. (See Figure 7). Reducing the daily intake recommendations by .5 cup revealed some changes (41.1% of parents and 64.5% of

children at 1 or more cups of fruit; 48.1% of parents and 24.3% of children at 1.5 or more cups of vegetables).

Food record data calculated using mypyramid.gov revealed that close to half of parents (48.6%) and more than half of children (61.7%) met recommendations for fat intake (i.e., 35% of calories from fat or less). Significantly fewer parents (37.4%) and children (33.6%) met recommendation regarding saturated fat (i.e., < 10% of calories from saturated fat).

The majority of parents had never visited www.mypyramid.gov (56.1%). In fact, 23.5% of parents had never heard of the online resource. However, 40.8% had visited once or twice and 3.0% reported visiting frequently.

Grocery Shopping and Cooking

Results indicated that the majority of parents were either primary decision makers (81.1%) or shared decision makers (18.2%) regarding what to purchase at the grocery store. Slightly more than a quarter of children were involved in selecting foods to purchase (28.7%). Most parents were the primary cook (81.8%) or shared the responsibility with someone else (14.4%). More than one-third of children were involved in determining what is served at dinner (37.9%).

Parenting Beliefs and Behaviors

Nearly all parents who provided complete responses to the PSDQ were classified as an Authoritative parent ($n=121$, 98.4%; 1.6% were classified as Permissive). Using clinical cutoff scores provided by the AYCE, it was determined that very few parents in the current sample reported experiencing child resistance to eating (6.6%) or parental aversion to mealtimes (9.4%).

All parents reported that mealtime was a generally positive environment and experience (i.e., 0% fell within the clinical range).

The majority of parents indicated that they somewhat or completely agreed with the statement “I eat the way I want my child to eat” (62.8%), whereas only 24.2% somewhat or completely agreed with the statement “I get as much physical activity as I would like my child to get.” Most parents reported that their child’s diet was nutritious (79.3%), and most had good insight regarding the connection between diet and health (78.0%). Additionally, most parents denied feeling restricted when eating “healthy” (75.0%) or bad when not allowing their child to eat tasty, but non-nutritious foods (71.6%). With regard to perceived knowledge, most parents believed that they know what a healthy serving size looks like (87.7%) and what foods/drinks are healthy and not healthy (94.7%). Very few parents reported that they withhold food as a punishment (3.9%).

Control vs. Intervention Follow-up

A series of 2 x 2 (time x condition) mixed model ANOVAs was conducted to evaluate the proposed hypotheses and determine the effect of the intervention on parent and child energy expenditure (decreases in sedentary behaviors, increases in physical activity behaviors) and energy intake (increases in nutrient dense foods, decreases in energy dense foods, frequency of fast food consumption). It is important to note that 22 participants completed follow-up after 6 weeks. Analyses failed to reveal any significant differences between individuals who completed within and after the follow-up deadline. Additionally, all analyses described below were run without the 22 participants who completed follow-up after 6 weeks; however, outcomes did not

vary with or without these participants included. Therefore, results presented below include the full sample (regardless of follow-up completion date).

Chi square analyses were conducted on discrete questions regarding parents self-report of changes (e.g., “I made changes for myself since I last participated”). Chi square results are presented before results of the mixed model ANOVAs.

Changes in Sedentary Behavior

The majority of parents (61.2%) reported that they did not make any changes to screen time for themselves or their child at follow-up (19.4% made changes for self and child, 14.9% made changes only for their child, and 4.5% made changes for themselves). Chi square analysis indicated that there were no differences in self-reported change between intervention and control participants, $\chi^2(3) = 3.73, p = .29$.

Mixed model ANOVA results failed to reveal a main effect of time for parents screen time or time x condition interactions for parent’s or children’s total screen time. A general effect of time for total child screen time across both conditions approached significance, $F(1, 93) = 3.20, p = .08, \eta^2 = .030$, with decreases in total screen time observed across groups from baseline ($M=17.09, SD=11.37$) to follow-up ($M=15.00, SD=10.90$). Significant changes were observed over time (across groups) for television viewing time for children, $F(1, 93) = 5.59, p = .02, \eta^2 = .057$ (baseline: $M=10.37, SD=8.11$; follow-up: $M=8.57, SD=6.57$), and parents, $F(1, 94) = 4.89, p = .03, \eta^2 = .049$ (baseline: $M=10.67, SD=8.28$; follow-up: $M=9.22, SD=7.13$), but not for computer time or video game play. No time x condition interactions were observed for television, computer, or video game play for children or parents. Table 2 provides means and standard deviations and Table 3 contains results of all significance tests.

Changes in Physical Activity

More than one-quarter (26.3%) of parents reported making physical activity changes for themselves and their child. Almost half (47.5%) did not make changes, 19.2% made changes for themselves only, and 7.1% made changes for their child only. Chi square analyses indicated that there were no group differences in reported changes, $\chi^2(3) = 3.22, p = .36$. The majority of parents (65.7%) denied making other general lifestyle changes (e.g., parking farther from entrances) (17.2% reported making general lifestyle changes for self and child, 14.1% for child only, and 3.0% for self only).

Mixed model ANOVA results failed to reveal a main effect of time or time x condition interaction for total minutes of child or parent physical activity. In contrast, main effects of time were observed on the number of days children, $F(1, 93) = 6.90, p = .01, \eta^2 = .069$ (baseline: $M=5.72, SD=1.67$; follow-up: $M=6.06, SD=1.64$), and parents, $F(1, 94) = 58.03, p < .001, \eta^2 = .382$ (baseline: $M=4.17, SD=1.91$; follow-up: $M=5.95, SD=1.65$) were active per week. Results failed to reveal a time x condition interaction for number of active days for children or parents,

Parental self-efficacy for child physical activity (PASE-child) across groups approached significance, $F(1, 88) = 3.90, p = .05, \eta^2 = .042$ (baseline: $M=15.76, SD=4.69$; follow-up: $M=16.60, SD=4.47$), but results failed to provide evidence of a time x condition interaction. Results also failed to reveal any changes in parental self-efficacy for parent physical activity (PASE-parent) over time or due to an interaction of time x condition. See Table 4 for means and standard deviations and Table 5 for significance test results.

With regard to active lifestyle behaviors (i.e., playing active games as a family, taking the stairs, and “getting as much physical activity as I would like my child to get”), there was a main

effect of time, $F(1, 92) = 12.78, p = .001, \eta^2 = .122$, for parents across groups. The interaction between time and condition was not significant. See Table 6 for means and standard deviations.

Nutrition and Dietary Behaviors

More than half of parents (57%) reported making nutritional changes for themselves and their child. Small percentages (6%) made changes only for themselves or only for their child, and 31.0% did not make any changes). Control participants were less likely to report making nutritional changes compared to intervention participants, $\chi^2(3) = 15.14, p = .002$, based on responses to a discrete question (“Did you make any changes for yourself or your child since you last participated?”). Consistent with this finding, the difference in the tallied number of changes endorsed by parents between groups approached significance, $t(96)=1.76, p=.082$. The total number of dietary changes reported for children was comparable between intervention and control participants, $t(90)=1.60, p=.11$. Total number of reported changes ranged from 0-10 for parents and 0-9 for children. (See Figures 8 and 9).

Despite self-reported changes, results of the 2x2 mixed model ANOVAs failed to reveal time x condition interactions for fruit, vegetable, fat, saturated fat, fiber, or caloric intake for children or parents. A significant main effect of time for children’s vegetable intake was observed, $F(1, 57) = 6.44, p = .01, \eta^2 = .101$, across groups. No other main effects were observed for parents or children. Results also failed to reveal a main effect of time or interaction of time x condition for Fruit and Vegetable Self-Efficacy (FVSE). See Table 7 for nutritional means and standard deviations and Table 8 for significance tests.

Finally, there were no observed main effects of time or time x condition interactions for child or parent fast food/casual dining. See Table 9 for means and standard deviations and Table 10 for significance tests.

Exploratory Analyses

Exploratory correlation analyses using baseline data were conducted to further examine the relationships among parent and child behaviors. Additionally, qualitative data provided by intervention and control participants were examined to explore the acceptability of the intervention and control participants' perceptions of the study. Given the incorporation of the TTM in the development and delivery of participant feedback, it was hoped that stage of change could be evaluated in terms of participant outcomes. However, cell sizes were very small when examining data available for baseline and follow-up (e.g., ≤ 1 person classified in Precontemplation). Cell sizes were reduced to as low as $n = 2$ when stage was entered into models examining outcome variables (excluding Precontemplation). As a result, there is a high risk that variation among individual participants could have affected overall outcome results. Future studies should seek to recruit more diversity with regard to stage of change so that this construct can be better understood in the context of treatment delivery for parents and children. See Table 11 for stage of change sample sizes.

Correlations are presented in Tables 12 and 13. Additional exploratory analyses were considered and are documented in Appendix S. Correlation results highlighted the associations between parent and child behaviors. For example, child and parent sedentary behaviors (total screen time and TV, computer, and video game time) were significantly related. Significant associations were also observed between parent and child nutritional intake (fruit, vegetable, fat,

saturated fat, and calories) and dining out. In contrast, parent and child physical activity (time and days) were not related.

Consistent with previous literature, parent and child BMI were significantly related (e.g., Agras et al., 2004; Wake et al., 2007) and higher child BMI percentiles were related with undesirable parent feeding practices like restriction of child intake and pressure to eat (e.g., Francis et al., 2001; Rhee, 2008). As expected, higher BMIs for parents and children were related with sedentary behaviors and lower rates of physical activity. Parenting style behaviors and self-efficacy were unrelated to child BMI; however, significant associations were observed with parents' own BMI.

Finally, parental self-efficacy for physical activity and fruit and vegetable intake was associated with outcome variables and many of the other parenting measures. Parenting and family factors (e.g., CFQ subscales, number of weekly family dinners, and self-efficacy) were also related with several child and parent outcome measures. However, parenting style was correlated with fewer variables than expected.

Intervention Acceptability

Intervention participants provided feedback about their experience with, and perception of, the intervention. Overall, the majority of intervention participants reported that the motivationally-tailored feedback was helpful (91.5% (n=43); 8.5% (n=4) somewhat unhelpful).

Parents commented on the visual illustrations with comments like:

“Very helpful in having discussions with my daughter about nutrition and exercise. It's always helpful to have a visual aid and topic guide. :) She was very responsive and I think she viewed it as something I did because I care about her. Double bonus. :)”

“The graphic representation of the information I gave was very helpful. I can say I spend two hours a day on the computer, but seeing it illustrated was striking.”

Other parents commented on the helpfulness of recommendations:

“The tips on increasing fiber intake, reducing soda/sugary juices by one serving a day, and the pre-portioned food options were most helpful.”

The majority of parents reported that they likely would have made changes anyway but that the program was somewhat influential (54.3% (n=25); 26.1% (n=12) very influential; 19.6% (n=9) not sure how much it influenced). Many parents noted that the program was influential in helping them identify areas to improve and problem-solve ways to do it:

“It was helpful to remember what I needed to add. It helped me to slowly make changes so that they would actually "stick" & not be forgotten!”

“This program has helped me to see how much I really wanted to improve my intake of raw vegetables and gave an extra "boost" to actually do it!”

“It affected what I changed & how I changed it. It showed me the areas that most needed to be addressed & it helped me to make a plan!” “It has made me realize the importance of changing my eating habits. If I pick or snack in the kitchen while I cook, then my kids will. I need to change myself so that I won't be correcting all of their bad habits until they leave the house. I don't want them to struggle with weight like I have.”

“It showed us where we need to improve and allowed me to make a conscious decision about how we would respond”

“This program is a bit of a motivator, I feel more accountable.”

“This program definitely made me aware of how much my family is eating out. I also notice we're over-budget on dining out at the end of the month, this program made it evident to me that I'm eating way more meals at fast food restaurants than I want to achieve my health goals.”

“I added more fresh fruits and Seth helped me plan our menu's more than normal.”

However, others provided candid comments that indicated that more intervention might be needed:

“It made good suggestions but it's still up to me to put them in place and I'm not sure if I will.”

“It didn't make me change but it reinforced the changes I wanted to make for myself.”

“I think it brought it to light a little earlier. We have a long way to go but we will get there.”

“The timing was just a bit difficult because it coincided with the holidays and the colder weather. That has been the obstacle (excuse?) for not making more strides, but I am confident that things will improve within the next two weeks.”

“I knew I needed to make changes as soon as I graduated in mid-December....I've been a little slow to start for various reasons.”

“I started making changes I just need to keep up with mine.”

Parents also accepted the tailored feedback, and all but one participant reported that it was relevant to their family. The majority of parents reported that they plan to refer back to the feedback in the future (87.8% (n=36)). Examples of parent comments regarding what they liked most about the program included:

“I love how it didn't make me feel bad, but was rather encouraged it by it!”

“I liked the personalized recommendations for my family.”

“Personalized comments and attention from the researcher(s). Easy to read feedback report that facilitates discussions with your child.”

“I felt it was honest and non judgmental.”

““Readiness to Change” section had the most helpful/useful suggestions.”

“The recommendation to schedule, schedule, schedule activity.”

“personalized and validating”

“It provided help in a positive way.”

“It was comprehensive and used common language rather than clinical language. I liked the tips from the Common Questions page.”

“That was personalized. Using my own examples to show me and my family what we were doing.”

Although most parents reported that there was “nothing” that they liked least, some parents commented on the limited human interaction and time burden. Additionally, the majority of comments focused on the baseline and follow-up surveys rather than the tailored feedback.

Below are all responses to the prompt: “What did you like least about the program?”:

“The questionnaire takes a while to fill out, but I realize how important it is to be thorough.”

“Questionnaires were pretty lengthy, but I understand the need for quality information so it's not a huge deal.”

“The time it takes to answer the questions.”

“Many questions on this survey were repeats from first survey.”

“That it takes only one child into account, and there are a lot of details that get lost in an online survey.”

“Very limited interaction with people/organization conducting this study made me a lot less attentive of this program and its submission requests. The survey is too long and some of the questions aren't worded very well. You need more questions with multiple choice options.”

“The timing of when I should/could incorporate the improvements...more about the survey itself rather than the feedback. The feedback itself was wonderful.”

Although most parents reported that there was “nothing” that could improve the program or reported that they “enjoyed” the program as-is, some suggestions for program improvement included:

“The season is very important for physical activity in the northern states. Activity level varies when it is winter. Data would vary depending on the time of the year this is completed - it is spring so physical activity outside is usually higher now.”

“Include the other members of the family”

“Invite us in to take our measurements and take the survey there. It makes it real and I'm a lot more likely to remember the outcome.”

“Perhaps improve the interface, make it more "fun" to submit the information.”

“Divide each section in two parts, the first part advising the participant to document everything their family eats on a designated day, and the second part (day after designated day) for the input of the day's food items. It's very time consuming to remember everything people eat the day before.”

Finally, all but one parent reported that they would recommend the program to other parents. Examples of comments explaining their decision to recommend the program included:

“Easy to do and it helps to write things down and see them in front of you”

“I feel it would be helpful to those who don't know where to get help”

“It gives great suggestions and confirms what you think you are doing correctly, or incorrectly and offers solutions and ideas.”

“It really brings the feeling of family and health living together, loving and growing healthy and strong together.”

“I think it is unlike other programs that really tear apart everything you are doing - making it seem like a monumental task to change - Your program offers encouragement without belittling”

“Yes, because it really helped me & my family in making a plan!”

“Absolutely. We're a pretty health-conscious family, and I do have lots of other parents ask me how I find time to work out and what I eat and how do I get my kids to eat "that stuff." If I was surprised by the results, I'm sure there are tons of others who would be too.”

“It's very informative, and I love that it is personalized”

“It is useful and lots of families need to have this info at their fingertips. Kids are getting more and more obese and we need to address it ASAP.”

Control Participant Feedback

Although control participants did not receive motivationally-tailored feedback before follow-up, some participants provided feedback about their experience with the study. Example responses suggest that control participants viewed the study positively and may have received some benefit from their participation. Responses included:

“I was probably already starting to think of change in the back of my mind, but I think this study pushed me over the edge on realizing what I changes I needed to make.”

“I thought this was a great study. It gave me a great perspective about what I am doing and what I want to do and the effects it will have.”

“I'm guessing you're doing the study to find out if people are eating healthy. Hopefully this study will be available to schools so better lunches are determined for our kids.”

“I think it's helpful to list everything we eat in a given day. I think we generally do a fairly good job, but I think we could still eat more fruits and vegetables.”

“It was helpful to really think about what we are doing”

“Made me realize that changes have got to be made in my family.”

“I think this was a great study to get us to realize what we are eating and feeding our children on a daily basis.”

“I went to food pyramid.gov and became more aware of the nutritional guidelines for kids the same day I did the first part of the study. I decided to do a food diary but never followed up with it. I have cut down on the amount of milk and dairy I offer each day.”

“Timing, knowing I was going to have to report and wanted to make some sort of change.”

“I have been paying more attention to my diet and my child's.”

“It made me think, which is what influenced me to be more aware. I probably would have tried to make these changes anyway, but the survey prompted me.”

“It made me realize that I need to always be in communication with my child, even when I'm not with her, I need to ask what she had for lunch and ask her how much she ate and what she didn't eat that was offered to her.”

“It confirmed to me that my family needs to eat better and get more exercise and to try to do it together.”

“Helps to point out drawbacks of current diet, makes you reflect on poor food choices and make better ones in the future.”

CHAPTER FIVE: DISCUSSION

More than two-thirds of adults and nearly one-third of children are overweight or obese (Ogden et al., 2008), and many do not obtain the recommended amounts of physical activity

(Center for Disease Control, 2001; Troiano et al., 2008) or eat suggested servings of fruits and vegetables (Ball et al., 2008; Guenther et al., 2006). The purpose of the current study was to evaluate the initial feasibility, efficacy, and acceptability of a single mailing of motivationally-tailored feedback designed to promote healthy lifestyle behaviors related to nutrition and physical activity for parents and children. The study design was based on literature suggesting that the provision of tailored feedback is effective in promoting behavior change (Agostinelli et al., 1995; Napolitano et al., 2006) – even from a single mailing (Chen et al., 2008). Overall, results of the current study suggest that significant modifications are necessary to improve the feasibility and efficacy of the intervention. However, participant feedback was very positive and indicated that the intervention was well-received.

Feasibility

Overall, the current trial raised significant questions regarding the feasibility of an online program designed to promote healthy lifestyle behaviors for parents and children. For example, the ability to generate accurate dietary feedback using only online measures presents unique challenges and questions regarding the reliability of the data. Parents appear to experience significant difficulty estimating portion sizes (despite prompts and a variety of examples). In fact, more parents than not failed to provide portion estimates or provided vague portion estimates (e.g., a bowl of cereal, cream in coffee, glass of water, tuna noodle casserole). Parents also failed to provide details regarding meals (for self and child) despite very specific and frequent prompting (e.g., turkey sandwich – with no mention of condiments, bread type, or additional ingredients like lettuce or other vegetables). These omissions and vague responses

occurred despite certification at the end of each food record that all responses were reviewed for accuracy including details and portion sizes.

Although www.mypyramid.gov was chosen to create dietary feedback due to its ability to generate automated feedback tables, creation by a reputable source (USDA) and the fact that it is freely available online, the program has significant limitations that reduced its utility. For example, the food tracker program on mypyramid.gov does not include an exhaustive list of foods and beverages. In fact, it omits many common foods and requires entry of individual meal components in many cases. The food tracker program also experiences frequent technological difficulties (e.g., error messages that prevent the entry of foods and calculations of daily intake). The error messages required frequent page refreshing, clearing of cookies, and restarts of the program. On average, the generation of food records for a dyad took approximately 60 minutes. The significant time requirement primarily reflects entry difficulty with attempting to match participant responses (e.g., ½ cup fried potatoes) with mypyramid.gov options (the “close enough” option such as hash browns fried in oil). A significant portion of pilot testing was devoted to trial and error in using the mypyramid.gov food tracker and experiences from this trial suggest that www.mypyramid.gov is a cumbersome program that is not user-friendly. Based on the participants’ responses and feedback, it seems relatively clear that an alternate method of parental reporting of nutrition is needed. There are other websites such as LiveStrong.com (Daily Plate link) that are designed to be easier to use by listing specific restaurant meals and brand name foods, and these may yield more complete, reliable data. However, they do not generate comparison charts and illustrations of nutritional intake. It is likely that an alternative to parent entry of such detailed data is needed, and such methods will of course come with their own

limitations (e.g., Cade, Burley, Warm, Thompson, & Margetts, 2004; Kim & Holowaty, 2003; Natarajan et al., 2006).

Participant Recruitment

Participant recruitment and attrition also posed significant challenges. In fact, it was necessary to add monetary compensation to promote recruitment and retention. Although compensation succeeded in increasing recruitment, the rate of recruitment remained relatively low. Baseline attrition frequently occurred at or before the food recall. The layout of the food recall page was changed to appear less intimidating and the page was moved near the end of the survey to ensure that the majority of baseline measures were completed prior to the food recall log. Attempts to obtain data from individuals who did not complete all baseline measures were unsuccessful despite multiple email requests and a link to access the survey where they left off. There appears to be something about the food recall task that parents may find particularly challenging or daunting. Efforts to improve participant engagement should be a focus of future trials.

Although parents from 31 states participated, indicating good potential dissemination, results indicate that this type of program may not reach or appeal to individuals who may benefit from it the most. The current sample was primarily Caucasian, highly active at baseline, mostly satisfied with their child's diet, and did not eat fast food/casual dining frequently. With regard to stage of change, the majority of parents and children were categorized as being in the Maintenance or Action stages. BMI for parents and BMI percentile for children were comparable to population estimates, indicating that more than half of children and slightly less than half of parents were of normal weight. Participant comments suggest that the program may appeal to

some parents as a check-in or confirmation that they are on the right track. Physical activity and healthy eating have been shown to be associated with health-related outcomes independent of weight (Blair, Cheng, & Holder, 2001; Blair & Morris, 2009). Therefore, the program may also have health-related benefits beyond weight-gain prevention for normal weight participants. Future trials should evaluate these potential benefits and ought to also consider specifically targeting families with overweight and/or physically inactive members.

Feedback Delivery

The generation of feedback was labor intensive (approximately 1 hour per report not including the hour required to generate the dietary intake data). Additionally, approximately half of intervention participants required a second email or call prompting them to confirm that they received their report. Despite these difficulties, enough data were obtained to move forward with development of an automatic feedback generator. Common themes emerged in parent goals, and recommendations based on dietary intake, physical activity, and stage of change data quickly became standardized. The creation of an Internet-based program capable of generating tailored feedback will be helpful when attempting to serve greater numbers of families in a time efficient manner.

Efficacy

In contrast to study hypotheses, results of the intervention suggest that a single mailing of motivationally-tailored feedback is largely ineffective in promoting targeted behavior changes for parents and children. The current findings suggest that simply completing a baseline survey that incorporates reflection on health behaviors and encourages self-monitoring may be powerful enough to produce at least some short-term behavioral changes. In fact, general changes from

baseline to follow-up were observed for parents and children across intervention and control groups. For example, although the majority of parents who participated reported that they did not make any changes to screen time for themselves or their child, a two hour per week decrease was observed from baseline to follow-up across conditions for children. This decrease appears to be primarily related to significant changes in television viewing. Parents' television viewing also decreased significantly over time by nearly 1.5 hours per week. These changes may indicate that television time is a behavior over which parents feel they can exert some control, unlike computer use which is necessary for work and video game play which was quite low for parents and children at baseline. Since this change occurred in both the intervention and control groups, the receipt of tailored feedback does not appear to enhance the act of self-monitoring, which is likely the active treatment component with regard to television and overall screen time changes.

All parents reported increasing the number of days on which they and their child engaged in physical activity; however, no changes were revealed in terms of the total time they spent engaged in physical activity. The lack of changes in total time spent engaged in physical activity for parents and children likely reflect a ceiling effect. Based on baseline parental self-report, the children were already active nearly 6 days per week for a total of 12 hours (5 hours more than minimum recommendations). Parents self-reported being active an average of 4 days and obtaining nearly 9 hours of moderate to vigorous physical activity every week (6.5 hours more than recommended amounts). Given these estimates, it is somewhat surprising that only 24.2% of parents reported obtaining as much physical activity as they would like their child to obtain. Parent's stage of change classifications also differed from their estimated physical activity time. These finding suggests that parents may have overestimated true physical activity time (i.e.,

activity that increases respiration and heart rate). For example, parents may have counted activities like cleaning (which has the potential to count as physical activity but only if parents exert themselves appropriately). For children, playing outside was cited by many parents as a frequent activity; however, it is unlikely that parents are aware of how many of the hours children spend outside are spent truly engaged in physical activity vs. sedentary play (e.g., sitting and playing other games that do not increase respiration and heart rate).

More than half of parents reported making changes in physical activity for themselves and their children at follow-up, which is consistent with the increased number of active days reported by parents. Parents in both groups also reported engaging more regularly in active lifestyle behaviors (i.e., taking the stairs, playing active games with their children, and obtaining as much physical activity as they would like their child to obtain) at follow-up compared with baseline. For some parents, increases in active lifestyle behaviors may have contributed to their perception that they increased their physical activity. Although parental self-efficacy for their own physical activity did not change, parents' confidence in their ability to ensure that their child obtained an hour of physical activity each day increased from baseline to follow-up for intervention *and* control participants. Increased parental confidence may reflect heightened awareness of child activity which may in turn have contributed to the perception reported by the majority of parents that they made changes related to physical activity behavior. These findings suggest that many parents are capable of evaluating their family's behavior and consequently making some short-term changes without direct intervention. Additionally, these behavioral changes appear to contribute to increased parental confidence in ensuring that their child is physically active despite a number of potential challenges. Increased confidence may help

parents to maintain these initial changes in physical activity behavior over longer periods of time. Additional follow-up periods are needed to clarify the effect of targeting parental self-efficacy with motivationally-tailored recommendations to assist parents in facing challenges that were previously hypothetical (e.g., challenges related to weather, increased time demands, etc.). Future studies may also wish to investigate regional effects on physical activity and parental self-efficacy. It is possible that self-efficacy for physical activity may be a state (e.g., seasonal) rather than trait construct.

With regard to nutritional changes, parents who received motivationally-tailored feedback were more likely to report making changes than parents in the control group. Follow-up analyses revealed that the total number of changes reported for parents approached significance, whereas the differences between groups for children did not vary significantly. Intervention parents were more likely to increase their fruit intake, decrease their fat intake, and decrease their child's caloric intake. The lack of change related to fast food/casual dining may reflect a floor effect (most parents and children dined out only once per week at baseline). Parental perceptions that they already met recommendations for fruit and vegetable intake (i.e., more than half of parents classified themselves and their child in the action or maintenance stages) may account for the findings related to these variables. Food recall data indicated that children in both groups increased their vegetable intake from baseline to follow-up. However, nearly half of the sample reported making changes specifically related to fruit *and* vegetable intake. The nature of this discrepancy is unclear, but it is possible that a single food recall may be insensitive to some nutritional changes (Natarajan et al., 2006; e.g., adding one piece of fruit per day). Future online research should focus more specifically on a variety of nutritional modifications like baking

rather than frying meat or using sugar substitutes given the limitations of the food recall method (Cade et al., 2001).

Interestingly, despite parental perceptions and corresponding stage of change classifications, results obtained via mypyramid.gov indicated that the majority of parents and children did *not* meet nutritional guideline recommendations for fruit intake. Additionally, only about one-quarter of parents and a little more than a tenth of children met nutritional guideline recommendations for vegetables. Overall, parent stage of change classifications for fruits and vegetables did not accurately capture dietary intake estimates using mypyramid.gov data. In fact, stage of change classifications did not become significantly more accurate even after minimum recommendations were reduced by .5 cup (for example, rather than classifying 2 cups as meeting recommendations for vegetables, criteria was reduced to 1.5 cups). This finding may indicate that food record data are not reliable. It is possible parents have particular difficulty accurately estimating portion sizes/true intake of fruits and vegetables, or that intake fluctuates greatly day-to-day. However, the lack of significant differences from baseline to follow-up suggests that these data were relatively consistent. Even if day-to-day variability is to blame, it suggests that parents may be 1) unaware of the fluctuation, 2) likely to subscribe to a “good enough” philosophy regarding intake in the face of daily variability (i.e., they eat recommended amounts more days than not or frequently enough that they are willing to classify it as “every day”), or 3) classifying themselves on their trait perception that they and their child eat a healthy diet without considering their actual day-to-day dietary behaviors. The lack of change in dietary behaviors suggests that more targeted psychoeducation and intervention may be necessary, especially for

overweight and obese participants for whom dietary changes in caloric and fat intake are imperative.

Although the intervention hypotheses were not supported by the data, results of exploratory analyses reinforced the importance of intervening with families and targeting parents in the context of child health-behaviors. Results of correlational analyses revealed associations between parental and child behavior (e.g., higher rates of parent screen time are associated with higher rates of child screen time). Additionally, feeding behaviors, parental self-efficacy, and parenting style behaviors were related to some child outcome variables. Unexpectedly, however, parenting styles were associated only with parental self-efficacy. Authoritarian and Permissive parenting practices also were related to child screen time. It is important to note that nearly all parents in the sample (98.4%) were classified as Authoritative. The lack of variation in parenting style may account for the low number of associations observed with other study variables. This finding also likely reflects the current self-selected sample, and indicates that this type of intervention may appeal to parents who are already highly invested in their child's wellbeing. It may be important for future studies to recruit parents with a wider range of parenting styles to evaluate how to best assist parents who vary with regard to parenting practices and interaction styles.

Acceptability

Intervention participants provided overwhelmingly positive feedback regarding their motivationally-tailored feedback reports. Several parents provided comments suggesting that MI was used effectively within the intervention feedback reports (e.g., feedback was “nonjudgmental” and “did not make you feel bad”). All but one parent reported that they would

recommend the program to other parents, and the majority of parents reported that the feedback was helpful, relevant to their family, and somewhat or very influential. Additionally, most parents reported that they would refer back to their feedback again in the future. A minority of parents offered feedback that suggested they would prefer more contact with the researchers. Comments also indicate that some participants might have benefited from a longer/more intense intervention. Future studies may wish to extend the program or adapt it to serve as an adjunct to in-person treatment. Finally, several participants reported that they used the feedback report to guide discussions with their children and family. Overall, the data regarding the acceptability of the intervention feedback was very positive and suggests that parents are responsive to this type of intervention despite their concerns regarding the time required to complete baseline and follow-up measures. Modifications of the program should focus on decreasing participant time burden and increasing the interactive features of the program. Automation of this program may help to provide more immediate intervention in a way that feels more collaborative to participants (e.g., interactive quizzes, on-the-spot feedback generation). Tips on how to use the feedback as a communication tool may enhance the effects of the intervention by involving more than a single family member (i.e., the parent). Additionally, this type of online tool could be used multiple times by parents to track progress, reassess goals, and receive updated tailored feedback as children age and parents encounter new challenges.

Limitations and Future Directions

Although the current sample was adequately powered to detect group differences and was comparable to the general population in terms of body mass index, they differed greatly in other

ways that limit the generalizability of the findings. The results of this study should be interpreted in light of its limitations.

First, the sample was self-selected. There are likely differences between parents who responded to this study vs. those who did not. This limits the interpretations of the results, and indicates a strong need to replicate this study with a more diverse sample. In particular, it is important to evaluate this intervention with parents who have a variety of parenting styles and struggle with mealtimes and feeding since it is likely that child outcomes vary based on these variables (Rhee, 2008; Birch et al., 2001; Carper et al., 2000). Additionally the current sample was predominantly Caucasian. This is of some concern given that non-Caucasian children and adults are at greater risk for the development of obesity (Ogden et al., 2008). The reason for the difficulty in recruiting non-Caucasian participants is not entirely clear. The study was conducted exclusively online and this may have affected response rates in numerous ways. Although many African American and Hispanic parents now have access to home computers and the Internet, their use of the web for help in obtaining health-related information is quite low (Cohall et al., 2004). However, researchers have suggested that self-selection rather than a true selection bias due to lack of access (e.g., digital divide) appears to influence participation in online studies (Wilson et al., 2006; Woodall et al., 2007). It is possible that there are racial differences in the perceived need for or desire to partake in interventions focused on achievement of a healthy weight and corresponding lifestyle behaviors (i.e., diet and exercise). Recruitment may be another issue to consider, but specific efforts were made to recruit a diverse sample for this study. Hard copies of the recruitment materials featured an active African American family, recruitment materials were left at pediatrician offices in North Philadelphia that serve primarily

African Americans, and the study was heavily advertised (electronically and with hard copy materials) in Central Florida, which has a high Hispanic population. The study was also advertised on blogs and other Internet sites that are likely frequented by individuals from a variety of backgrounds, providing additional support to suggest that lack of racial diversity in the sample may be more strongly related to the topic of the intervention and use of the Internet rather than the recruitment efforts. Finally, results of a previous in-person study focused on girls' body image conducted by the current research team using similar recruitment methods yielded more non-Caucasian participants (28.9% non-Caucasian; Hayes & Tantleff-Dunn, 2010) than the current trial. This suggests that future studies should more carefully evaluate the perceptions of the recruitment messages for online studies and investigate any perceived barriers to participation. The collection of focus group data might be particularly helpful in terms of marketing an online intervention focused on health behaviors to parents of racially and ethnically diverse backgrounds.

Second, many of the participants engaged in a number of healthy behaviors at baseline. For example, the sample was very active and lack of change in physical activity at follow-up may have reflected a ceiling effect rather than lack of intervention efficacy. Future studies should set inclusion criteria (i.e., parent weekly activity minutes < 150 minutes; child weekly activity minutes < 420 minutes; BMI in the overweight or obese range) to assess the intervention with a clinical population. Greater recruitment effort may be needed to reach out to families who are in need of intervention but have not yet decided to make health-related changes.

Third, the current online intervention trial relied exclusively on self-report data at baseline and follow-up. This allowed for a pure evaluation of the feasibility to work with parents

online exclusively; however, it limited the ability to objectively report baseline and follow-up changes in BMI, physical activity, and dietary intake. Although parental estimates and child weight are highly correlated (Banach et al., 2007), objective measurement is a preferred strategy (Akinbami & Ogden, 2009). Alternatives to in-person contact that may prove helpful include mailing parents a tape measure for all pre- and post-measurements, and providing in-home scales or requiring that scales be available in the home as part of inclusion criteria. Future funded trials also should employ objective physical activity assessment using actigraphs or pedometers. However, these tools also carry with them limitations (e.g., requires participants to wear and use them accurately, may be overly sensitive to movements of children, limits ability to assess some types of physical activity like swimming and cycling, and financial cost; McClain & Tudor-Locke, 2009). Finally, phone-based interviews for 24-hour food recalls would afford the opportunity to acquire more detailed information about food intake and portion sizes. Researchers would also be able to clarify responses and have participants assist with the entry of the food record into mypyramid.gov or another online program. This would ensure greater accuracy regarding true dietary intake. However, this would increase the participant time requirement and required researcher resources (time and cost). Although one alternative could be to have participants use the mypyramid.gov food entry system and provide a copy of their results, the time-consuming and cumbersome nature of this food tracking program is likely to greatly decrease participation. Future studies may wish to ask participants to monitor their food intake for 48 hours prior to completing baseline measures. Monitoring booklets could be provided for parents and children, as well as stamped, addressed return envelopes to decrease participant burden of reentry. Additionally, some studies have begun to utilize other modes of

communication and monitoring (e.g., text messages – Patrick et al., 2009; digital photographs used to estimate caloric intake and portions – Higgins et al., 2009). The utilization of these types of technology may help to reduce participant burden (time and recall) and improve the interactive features of the current program.

Fourth, the study utilized the TTM as a theoretical model and parents in the intervention group received stage-based feedback. However, the majority of participants fell in the Maintenance or Action stages, suggesting that they viewed themselves and their children as already meeting recommendations for physical activity and fruit and vegetable intake. This limited our ability to examine the effects of stage on participant outcome as well as the utility of the TTM in the context of a healthy lifestyle-focused behavior change intervention for parents and children. Future studies utilizing the TTM should ensure that adequate numbers of individuals are recruited in each of the five stages of change. This will allow for appropriate examination of the effectiveness of stage-based treatment for parents and children. It is important to note that there are some questions regarding the usefulness of stage measures for parent physical activity and parent and child fruit and vegetable intake in the current study. Based on their data, parents appeared to view themselves as doing more poorly in terms of stage compared with their self-reported physical activity time. Additionally, parents viewed themselves and their child as doing much better than compared with nutritional information obtained from mypyramid.gov. These findings again highlight the importance of obtaining objective data with regard to outcomes when possible. However, they also indicate that stage of change may reflect parental traits that may be more challenging to change in the context of behavioral weight loss.

Future studies with adequate samples of each stage category will help to answer these questions about the TTM and its effectiveness in family-based interventions.

Finally, the current trial evaluated the effects of a single mailing of motivationally-tailored feedback. Results suggest that the identified intervention was not robust enough to promote change beyond that of a control group who also completed measures and were provided a referral to www.mypyramid.gov. Future studies should modify the current design in several ways in addition to those described previously. First, the effects of an extended intervention trial should be assessed. For example, parents could receive multiple mailings of psychoeducational material combined with tailored feedback on reported behaviors and changes over a course of 8-10 weeks. This would allow researchers to guide parents through specific topics (e.g., Week 1: Physical Activity, Week 2: Dining Out) and encourage them to use empirically-supported behavioral techniques that are matched to their stage of change. This design would reduce barriers related to in-person treatment while promoting more interaction between participants and the researchers. Second, the current program should be evaluated as an adjunct to gold-standard treatment (i.e., Group-based behavioral weight loss for parents and children vs. group-based behavioral weight loss for parents and children + motivationally-tailored online feedback). This program could also be used to evaluate weight regain prevention after termination of standard treatment. Third, the current program could be adapted to include more clinical contact and intervention. For example, a brief 5-session mixed telephone and Internet-based program could be created and evaluated based on the current and extant work: Session 1) interview and assessment via telephone (baseline measures completed online); Session 2) MI feedback-delivery and goal setting via telephone and e-mail; Sessions 3 and 4) Goal review and problem-solving;

and Session 5) relapse prevention. This type of treatment would continue to decrease participant burden of attending in-person sessions, utilize the existing feedback program, and capitalize on empirically-supported intervention methods (e.g., relapse prevention). Finally, a comparison of a mixed telephone/Internet MI-feedback program and gold-standard treatment should be conducted. These extensions will help to further evaluate the potential benefits of using technology to reach families and assist them in making health-related behavior changes.

Conclusions

Collectively, results of the current study suggest that an online motivationally-tailored feedback program would be well-received by parents, but significant modifications are necessary to improve feasibility and efficacy. In particular, refinements in measurement of dietary and physical activity behaviors are required. Expansion of the program also should be considered. Future trials ought to target families who are in particular need of making health-related behaviors changes (i.e., inactive, overweight or obese). Although a previous uncontrolled study reported significant changes for children related to knowledge and healthy lifestyle behaviors after the provision of tailored feedback (Chen et al., 2008), the current trial demonstrated that a single mailing may not produce results for parents and children that differ significantly from a control condition. In fact, results suggest that simply participating in a study focused on health-related behaviors may be salient enough to promote some short-term behavior changes related to physical activity. The current trial asked parents in both conditions to complete multiple retrospective self-monitoring forms related to physical activity and dietary intake for parent and child. Completion of a decisional balance and other MI-questions did not enhance the effects of general participation. However, results provide continued support for the incorporation of

parents in treatment and prevention programs for children ages 6 to 11 years old. Future studies may wish to evaluate the efficacy of motivationally-tailored feedback as a communication tool to promote increased dialogue and collaboration among parents and children related to healthy lifestyle behaviors. Additionally, future trials may focus on evaluating the feasibility and efficacy of motivationally-tailored feedback as the focus of an extended family-based online intervention, as an adjunct to existing behavioral weight loss interventions, and as an adapted mixed contact (telephone and Internet) intervention. Given the importance of finding ways to address the increasing rates of obesity and associated health problems, it is imperative that researchers continue working toward the development of family-based interventions that are both feasible and result in physical activity and nutritional changes that clearly help to lower current and future health risks.

APPENDIX A: FIGURES AND TABLES

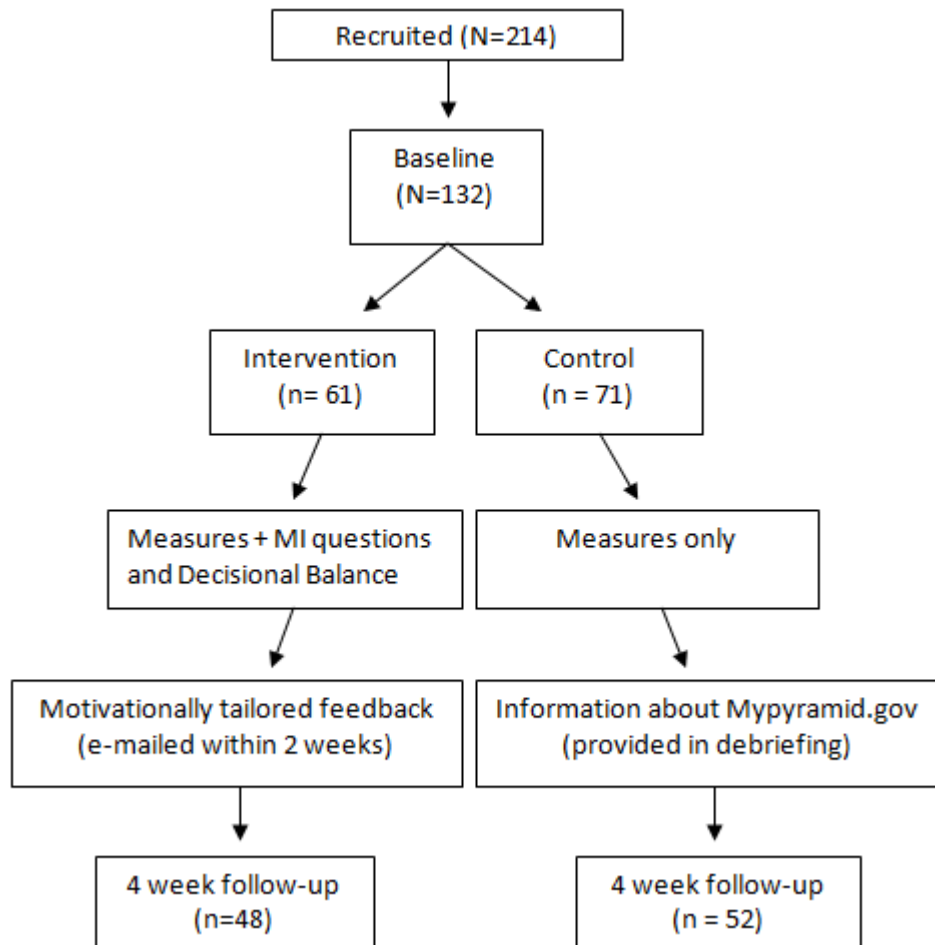


Figure 1. Study Flowchart.

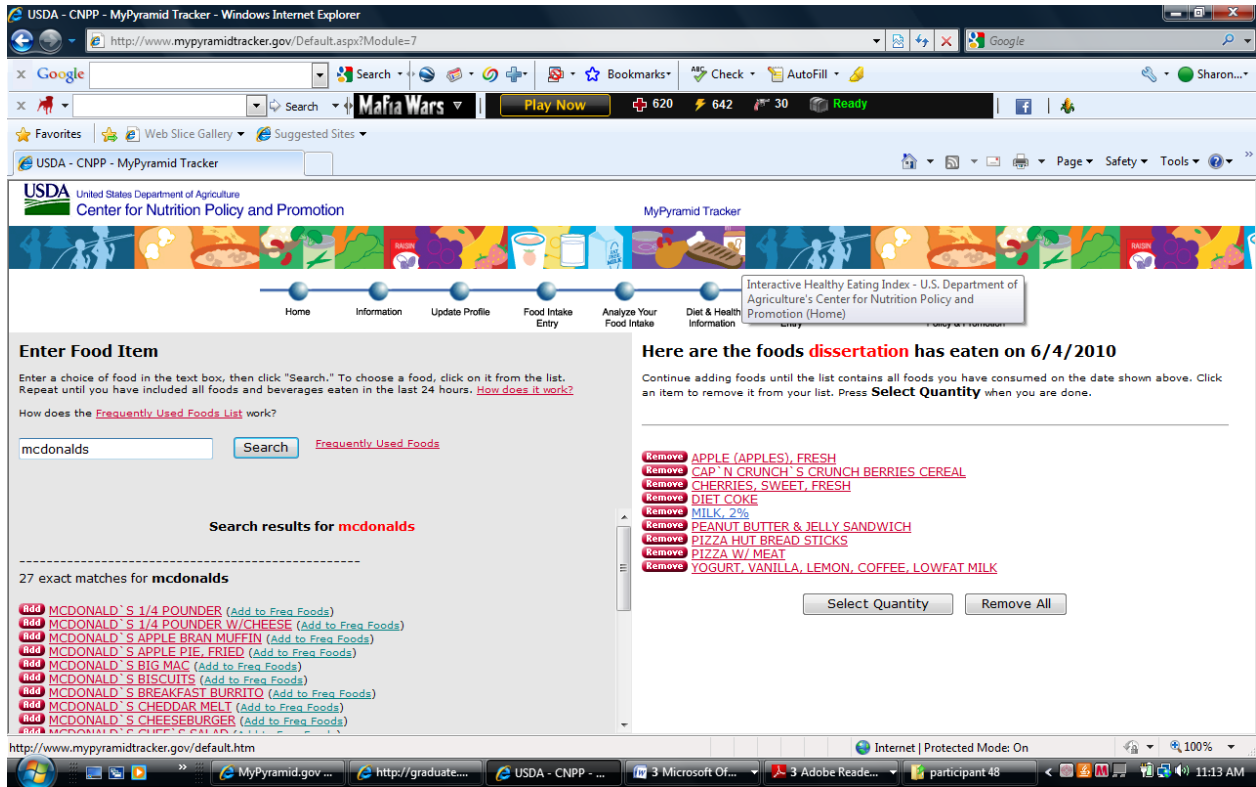


Figure 2. Food tracker screen shot (<https://www.mypyramid.gov>).

SERVING SIZE CARD:

Cut out and fold on the dotted line. Laminate for longtime use.

















<p>1 Serving Looks Like ...</p> <p>GRAIN PRODUCTS</p> <p>1 cup of cereal flakes = fist </p> <p>1 pancake = compact disc </p> <p>½ cup of cooked rice, pasta, or potato = ½ baseball </p> <p>1 slice of bread = cassette tape </p> <p>1 piece of combread = bar of soap </p>	<p>1 Serving Looks Like ...</p> <p>VEGETABLES AND FRUIT</p> <p>1 cup of salad greens = baseball </p> <p>1 baked potato = fist </p> <p>1 med. fruit = baseball </p> <p>½ cup of fresh fruit = ½ baseball </p> <p>¼ cup of raisins = large egg </p>
<p>1 Serving Looks Like ...</p> <p>DAIRY AND CHEESE</p> <p>1½ oz. cheese = 4 stacked dice or 2 cheese slices </p> <p>½ cup of ice cream = ½ baseball </p> <p>FATS</p> <p>1 tsp. margarine or spreads = 1 dice </p>	<p>1 Serving Looks Like ...</p> <p>MEAT AND ALTERNATIVES</p> <p>3 oz. meat, fish, and poultry = deck of cards </p> <p>3 oz. grilled/baked fish = checkbook </p> <p>2 Tbsp. peanut butter = ping pong ball </p>

Figure 3. Example of stimuli.

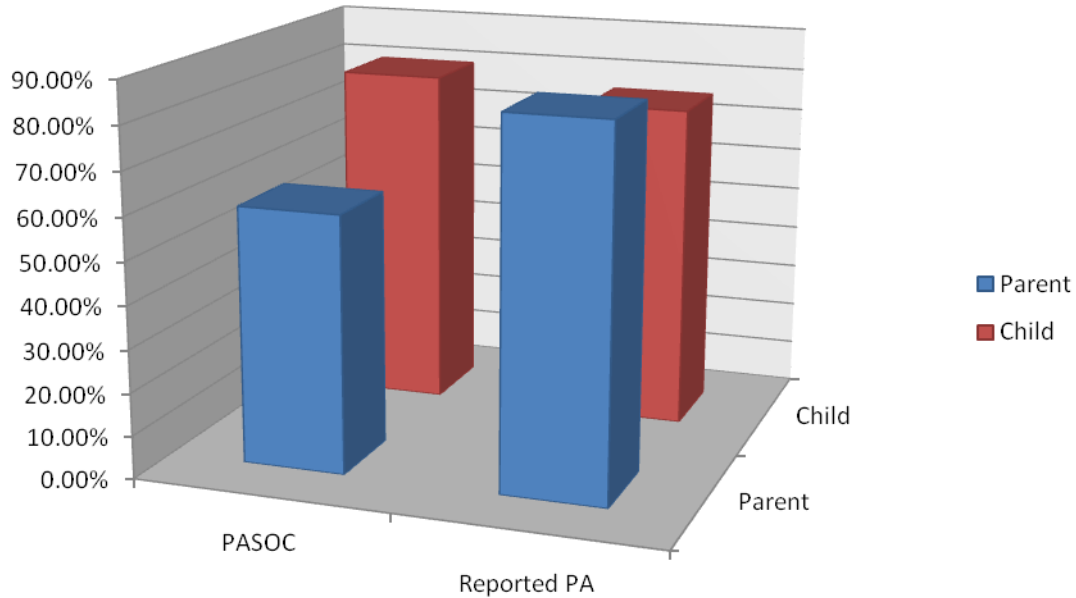


Figure 4. PASOC vs. Reported PA.

This figure illustrates the percentage of parents and children who met physical activity recommendations based on the Physical Activity Stage of Changes measures (action or maintenance stages) and parental self-report of total time engaged in physical activity. Parents were classified as meeting recommendations if they reported 150 minutes or more of moderate to vigorous activity (or 90 minutes of vigorous activity). Children were classified as meeting criteria if they engaged in 420 minutes of physical activity per week based on parental report.

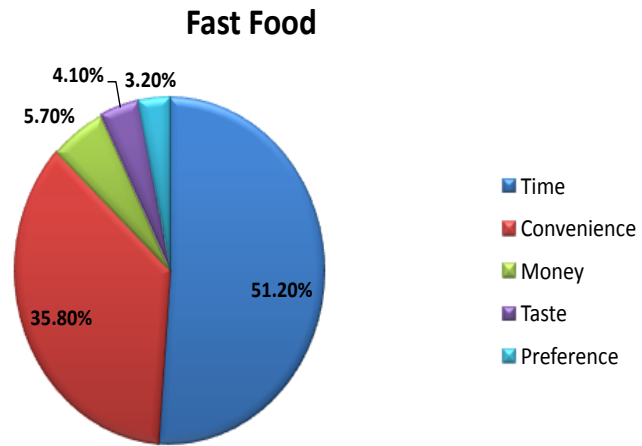


Figure 5. Reasons for fast food intake.

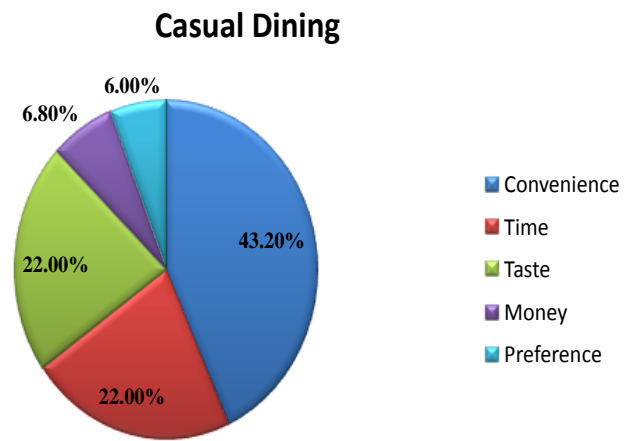


Figure 6. Reasons for casual dining intake.

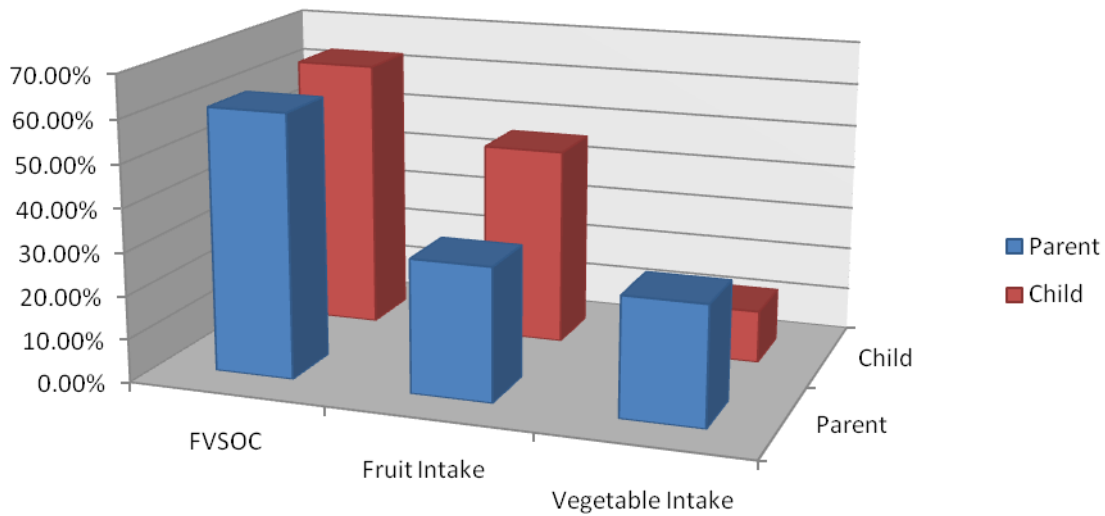


Figure 7. FVSOC vs. Reported Fruit and Vegetable Intake.

This figure illustrates the percentage of parents and children who met recommendations regarding fruit and vegetable intake using the Fruit and Vegetable Stage of Change measures (action or maintenance stages) and parental self-report of intake using an online 24-hour food recall and data generated from mypyramid.gov. Parents and children were classified as meeting recommendations if they consumed 1.5 or more cups of fruit and 2 cups or more of vegetables per day.

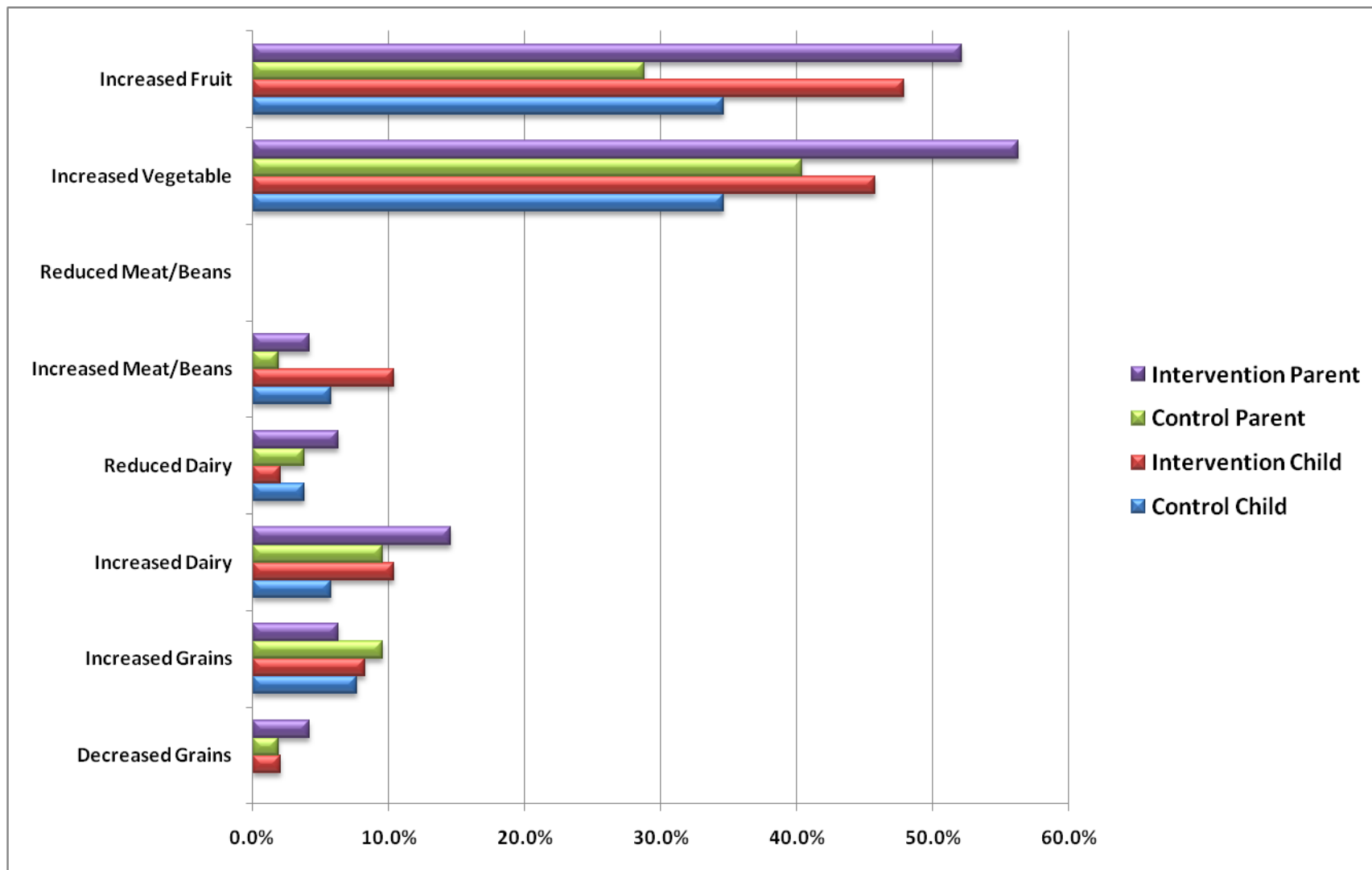


Figure 8. Reported Food Group Changes.

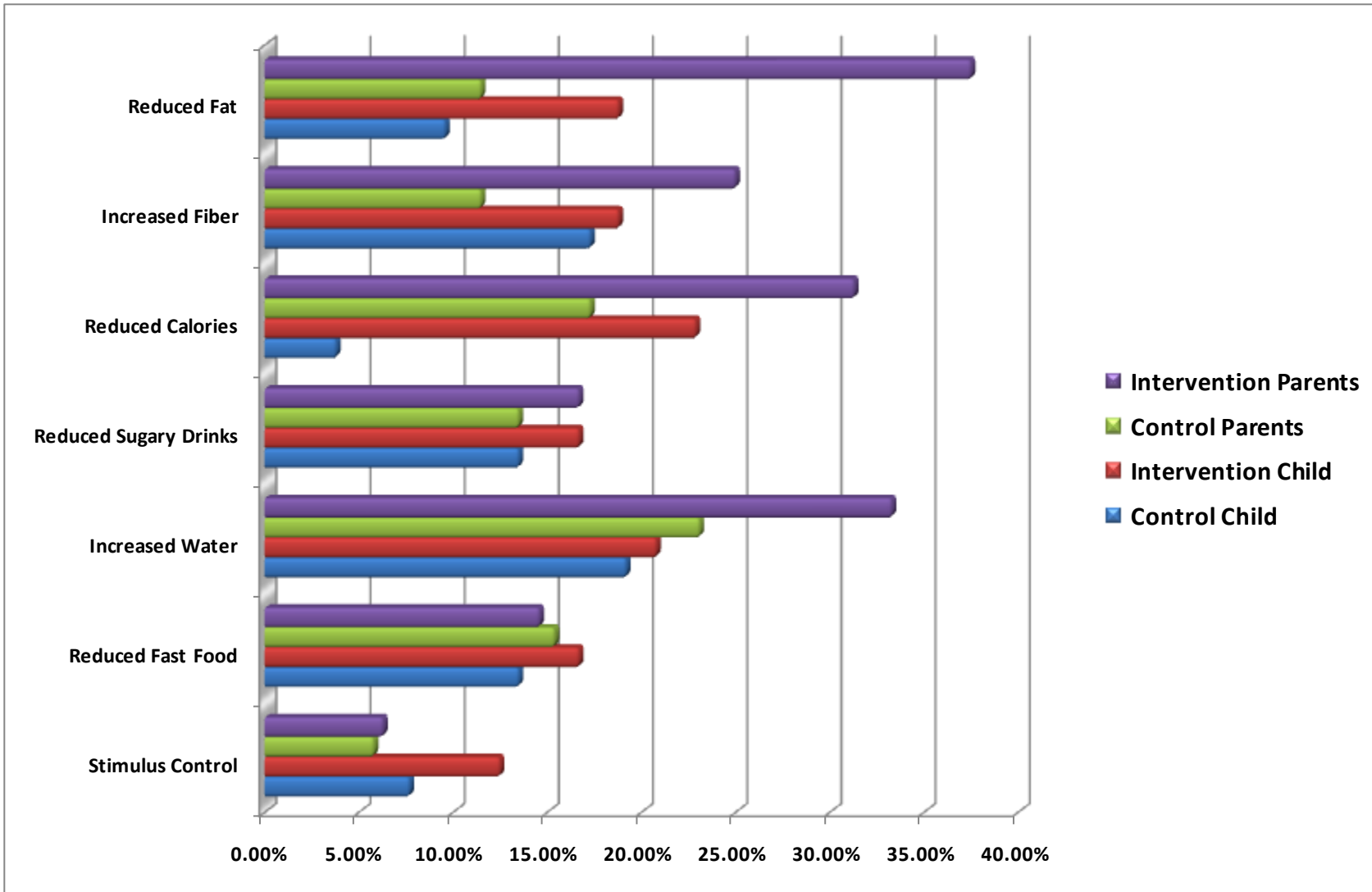


Figure 9. Other Nutritional Changes.

Table 1 Baseline Group Differences

Variables	Control <i>M(SD)</i>	Intervention <i>M(SD)</i>	Significance Test ^a	<i>p</i> Value
Race				
Parent			$\chi^2(4) = 1.7$	.79
Child			$\chi^2(4) = 4.0$	.41
Weight Desire				
Parent			$\chi^2(1) = 1.2$	.27
Child			$\chi^2(2) = 1.6$	.45
Sex				
Parent			$\chi^2(1) = 0.5$	.60
Child			$\chi^2(4) = 1.0$	1.0
Age				
Parent	36.01(4.96)	36.56(6.60)	$t(128) = .53$	.60
Child	8.25(1.71)	8.07(1.62)	$t(125) = -.63$	.53
BMI				
Parent	26.82(7.62)	27.52(6.43)	$t(124) = -.55$	.58
Child	57.73(33.99)	54.40(33.73)	$t(120) = -.54$	.59
Dining Out Frequency				
Parent	1.68(1.36)	1.66(1.56)	$t(128) = -.09$	.93
Child	1.39(1.11)	1.31(1.07)	$t(129) = -.41$	.68
Screen Time ^b				
Parent	1683.13(907.85)	2049.50(1663.48)	$t(125) = 1.56$	.12
Child	1153.21(912.34)	1028.50(744.95)	$t(125) = -.84$	.40
Physical Activity ^b				
Parent	426.10(383.98)	407.00(327.12)	$t(125) = -.30$	.77
Child	712.46(409.03)	680.17(407.93)	$t(125) = -.45$	.66

Note. ^aOutliers excluded from calculations. ^bTime presented in minutes.

Table 2 Screen Time Means and Standard Deviations

	Baseline ^a <i>M(SD)</i>	Follow-up ^a <i>M(SD)</i>
Screen Time		
Parent (<i>n</i> =94)		
Intervention	29.74(15.52)	30.03(17.71)
Control	28.36(15.72)	25.87(15.62)
Child (<i>n</i> =95)		
Intervention	17.84(12.81)	15.22(10.96)
Control	17.78(13.90)	14.50(11.04)
Television Time		
Parent (<i>n</i> =96)		
Intervention	11.05(8.99)	10.38(7.63)
Control	10.31(7.64)	8.15(6.53)
Child (<i>n</i> =95)		
Intervention	10.65(7.32)	9.72(8.02)
Control	9.10(5.20)	7.66(4.69)
Computer Time		
Parent (<i>n</i> =96)		
Intervention	18.79(13.80)	18.95(15.26)
Control	17.40(13.18)	17.78(14.11)
Child (<i>n</i> =95)		
Intervention	2.49(2.23)	2.71(2.85)
Control	3.75(3.80)	3.38(3.67)
Video Game Time		
Parent (<i>n</i> =91)		
Intervention	.55(.133)	.59(1.77)
Control	.21(.58)	.64(1.73)
Child (<i>n</i> =78)		
Intervention	1.63(1.80)	1.72(1.79)
Control	1.58(1.62)	2.80(4.75)

Note. ^a = Presented in reported number of hours.
Outliers removed from analyses.

Table 3 Changes in Sedentary Behavior

<u>Variables</u>	<u>Significance Test</u>	<u>p Value</u>	<u>η^2 Value</u>
Total Screen Time			
Parent			
Main Effect	$F(1, 92) = 0.52$	.47	.006
Interaction	$F(1, 92) = 0.83$	.37	.009
Child			
Main Effect	$F(1, 93) = 3.20$	.08	.030
Interaction	$F(1, 93) = 0.19$	.66	.002
Television Time			
Parent			
Main Effect	$F(1,94) = 4.89$	.03	.049
Interaction	$F(1,94) = 1.34$	.25	.014
Child			
Main Effect	$F(1,93) = 5.59$	.02	.057
Interaction	$F(1,93) = 0.25$	.62	.003
Computer Time			
Parent			
Main Effect	$F(1,94) = 0.04$	.85	.000
Interaction	$F(1,94) = 0.00$	.94	.000
Child			
Main Effect	$F(1,93) = 0.05$	.82	.001
Interaction	$F(1,93) = 0.74$	.39	.008
Video Game Time			
Parent			
Main Effect	$F(1,89) = 1.43$	.23	.016
Interaction	$F(1,89) = 0.93$	.34	.010
Child			
Main Effect	$F(1,76) = 2.27$	.14	.029
Interaction	$F(1,76) = 1.67$	.20	.021

Note. Outliers removed from analyses.

Table 4 Physical Activity Means and Standard Deviations

	<u>Baseline <i>M(SD)</i></u>	<u>Follow-up <i>M(SD)</i></u>
Physical Activity ^a		
Parent (<i>n</i> =92)		
Intervention	385.33(233.52)	458.00(346.30)
Control	454.47(405.07)	443.04(417.74)
Child (<i>n</i> =94)		
Intervention	658.89(412.14)	682.67(364.93)
Control	697.35(406.05)	762.86(525.44)
Days Active ^b		
Parent (<i>n</i> =96)		
Intervention	3.87(1.78)	5.91(1.62)
Control	4.44(2.00)	5.98 (1.70)
Child (<i>n</i> =95)		
Intervention	5.67(1.86)	6.04(1.59)
Control	5.76(1.49)	6.08(1.69)
PASE		
Parent (<i>n</i> =85)		
Intervention	16.78(5.08)	17.17(5.40)
Control	17.59(5.44)	17.04(6.18)
Child (<i>n</i> =85)		
Intervention	15.74(6.22)	16.12(4.58)
Control	15.77(4.08)	17.02(4.38)

Note. ^a = Presented in reported number of minutes. ^b = Presented in reported days. PASE = Physical Activity Self-Efficacy (higher scores indicate more confidence). Outliers removed from analyses.

Table 5 Changes in Physical Activity

<u>Variables</u>	<u>Significance Test</u>	<u>p Value</u>	<u>η^2 Value</u>
Physical Activity			
Parent			
Main Effect	$F(1,90)=0.73$	.40	.008
Interaction	$F(1,90)=1.37$	.26	.015
Child			
Main Effect	$F(1,92)=2.43$	.12	.026
Interaction	$F(1,92)=0.53$	.47	.006
Days Active			
Parent			
Main Effect	$F(1,94)=58.03$	<.001	.382
Interaction	$F(1,94)=1.15$	.29	.012
Child			
Main Effect	$F(1,93)=6.90$	.01	.069
Interaction	$F(1,93)=0.05$	.83	.001
Self-Efficacy			
Parent			
Main Effect	$F(1,83)=0.03$	.87	.000
Interaction	$F(1,83)=0.94$	.33	.011
Child			
Main Effect	$F(1,88)=3.90$	.05	.042
Interaction	$F(1,88)=1.11$	.30	.012
Lifestyle Behaviors			
Main Effect	$F(1,92) = 12.78$	.001	.122
Interaction	$F(1,92) = 2.82$	.10	.030

Note. Outliers removed from analyses.

Table 6 Changes in Active Lifestyle Behaviors

	<u>Baseline <i>M(SD)</i></u>	<u>Follow-up <i>M(SD)</i></u>
Intervention (<i>n</i> =45)	5.44(1.39)	6.07(1.27)
Control (<i>n</i> =49)	5.73(1.32)	5.96(1.57)

Note. Higher scores indicate more engagement in active behaviors and positive perception of activity level.

Table 7 Nutrition Means and Standard Deviations

Variables	Baseline <i>M(SD)</i>	Follow-up <i>M(SD)</i>
Fruit		
Parent		
Intervention (<i>n</i> =22)	.96(1.28)	1.14(1.22)
Control (<i>n</i> =36)	.98(1.00)	1.04(1.10)
Child		
Intervention (<i>n</i> =22)	1.62(1.25)	1.80(1.77)
Control (<i>n</i> =36)	1.29(1.14)	1.82(1.93)
Vegetable		
Parent		
Intervention (<i>n</i> =25)	1.66(1.04)	1.92(1.48)
Control (<i>n</i> =34)	1.61(.91)	1.39(.99)
Child		
Intervention (<i>n</i> =24)	1.03(.58)	1.46(1.29)
Control (<i>n</i> =35)	1.01(.71)	1.27(1.10)
Fat ^a		
Parent		
Intervention (<i>n</i> =25)	36.08(9.70)	36.03(10.00)
Control (<i>n</i> =36)	35.47(8.40)	33.99(7.54)
Child		
Intervention (<i>n</i> =25)	31.59(8.72)	34.54(11.26)
Control (<i>n</i> =36)	35.50(7.66)	34.34(6.00)
Saturated Fat ^a		
Parent		
Intervention (<i>n</i> =25)	11.64(5.03)	11.61(3.32)
Control (<i>n</i> =36)	12.94(4.82)	12.00(3.71)
Child		
Intervention (<i>n</i> =25)	10.76(3.68)	11.62(3.22)
Control (<i>n</i> =36)	12.95(4.06)	13.02(3.44)
Calories		
Parent		
Intervention (<i>n</i> =24)	1788.45(454.65)	1664.29(784.18)
Control (<i>n</i> =35)	1590.11(501.72)	1568.97(557.27)
Child		
Intervention (<i>n</i> =23)	1768.04(505.70)	1855.04(820.78)
Control (<i>n</i> =36)	1794.42(543.49)	1751.44(558.06)
Total Number of Changes		
Parent		
Intervention (<i>n</i> =48)	--	2.98(2.12)
Control (<i>n</i> =52)	--	2.12(2.67)
Child		
Intervention (<i>n</i> =43)	--	2.70(1.99)

Control (<i>n</i> =49)	--	1.96(2.39)
FVSE		
Intervention (<i>n</i> =40)	29.38(10.93)	31.73(9.68)
Control (<i>n</i> =44)	32.25(8.99)	31.84(10.63)

Note. FVSE = Fruit and Vegetable Self-Efficacy (higher scores indicate more confidence). ^a
= % of calories. Recommendations: fruit (1.5+cups), vegetables (2+cups), Fat (<35% of
calories), Saturated Fat (<10% of calories). ⁺ = Intervention (*n*=25), Control (*n*=36).

Table 8 Changes in Nutrition Data

Variables	Significance Test	<i>p</i> Value	η^2 Value
Fruit			
Parent			
Main Effect	$F(1,56) = 0.43$	.52	.008
Interaction	$F(1,56) = 0.11$	.74	.002
Child			
Main Effect	$F(1,57) = 2.17$	.15	.037
Interaction	$F(1,57) = 0.52$	.47	.009
Vegetable			
Parent			
Main Effect	$F(1,57) = 0.009$	.93	.000
Interaction	$F(1,57) = 1.37$	.25	.023
Child			
Main Effect	$F(1,57) = 6.44$	.01	.101
Interaction	$F(1,57) = 0.40$	.53	.057
Fat			
Parent			
Main Effect	$F(1,59) = 0.31$	.58	.005
Interaction	$F(1,59) = 0.27$	.61	.005
Child			
Main Effect	$F(1,59) = 0.43$	.52	.007
Interaction	$F(1,59) = 2.25$	.14	.037
Saturated Fat			
Parent			
Main Effect	$F(1,59) = 0.48$	.49	.008
Interaction	$F(1,59) = 0.42$	.52	.007
Child			
Main Effect	$F(1,59) = 0.56$	.45	.010
Interaction	$F(1,59) = 0.43$	.52	.007
Calories			
Parent			
Main Effect	$F(1,57) = 0.72$	.40	.012
Interaction	$F(1,57) = 0.36$	.55	.006
Child			
Main Effect	$F(1,57) = 0.05$	.82	.001
Interaction	$F(1,57) = 0.43$	.51	.008
FVSE			
Main Effect	$F(1,82)=0.90$	.35	.011
Interaction	$F(1,82)=1.82$	.18	.022

Note. FVSE = Fruit and Vegetable Self-Efficacy. Outliers removed from analyses.

Table 9 Fast Food/Casual Dining Means and Standard Deviations

	<u>Baseline <i>M(SD)</i></u>	<u>Follow-up <i>M(SD)</i></u>
Parent (<i>n</i> =94)		
Intervention	1.76(1.62)	1.77(1.62)
Control	1.66(1.41)	1.77(2.28)
Child (<i>n</i> =85)		
Intervention	1.37(1.13)	1.27(.92)
Control	1.42(1.18)	1.59(2.18)

Table 10 Changes in Fast Food/Casual Dining

	<u>Significance Test</u>	<u>p Value</u>	<u>η^2 Value</u>
Parent			
Main Effect	$F(1,92)=0.12$	.73	.001
Interaction	$F(1,92)=0.08$	.78	.001
Child			
Main Effect	$F(1,92)=0.06$	.81	.001
Interaction	$F(1,92)=0.82$	.37	.009

Table 11 Stage of Change Distribution

	<u>Precontemplation</u>	<u>Contemplation</u>	<u>Preparation</u>	<u>Action</u>	<u>Maintenance</u>
PASOC-P (n=132)	1.5%	16.7%	22.0%	18.9%	40.9%
Intervention	0	6	11	9	22
Control	1	10	14	7	20
PASOC-C (n=131)	1.5%	6.1%	12.2%	5.3%	74.9%
Intervention	1	1	10	3	32
Control	0	6	4	3	39
FVSOC-P (n=128)	3.1%	10.9%	25.0%	13.3%	47.7%
Intervention	1	5	18	6	15
Control	1	5	10	5	31
FVSOC-C (n=128)	3.9%	9.4%	23.4%	8.6%	54.7%
Intervention	2	5	15	3	20
Control	1	5	9	5	31

Note. PASOC=Physical Activity Stage of Change. FVSOC=Fruit and Vegetable Stage of Change. P= Parent. C=Child. The first line represents percentage of total sample included in the stage. Lines corresponding with “Intervention” and “Control” represent the total number of individuals available for analysis at baseline and follow-up.

Table 12 Baseline Correlations for Child Behaviors

	Child Screen Time	Child TV	Child Computer	Child Video Games	Child Days Active	Child PA Time	Child Dining Out	Child BMI	Child Fruit Intake	Child Veggie Intake
BMI-C	.17	.09	.09	.20*	-.29**	-.14	-.01	--	.08	.06
BMI-P	.20*	.06	.03	.38**	-.14	-.01	.11	.35**	.00	.02
Screen Time-C	--	.87**	.72**	.59**	-.45**	-.10	.12	.17	-.02	.08
Screen Time-P	.33**	.30**	.25**	.17	-.12	.09	.08	-.01	-.10	.05
TV-P	.32**	.38**	.13	.10	-.01	.03	-.01	.01	.07	-.02
Computer -P	.24**	.18*	.26**	.12	-.13	.10	.10	-.03	-.18	.06
Video Games -P	.19*	-.00	.01	.44**	-.25**	-.03	.16	.06	.00	.17
PA Days-C	-.45**	-.33**	-.40	-.29**	--	.43**	.01	-.29**	-.09	-.04
PA Days -P	-.13	-.16	-.07	-.03	.08	.16	-.16	-.12	-.02	.04
Family Dinner Nights	-.20*	-.14	.17	-.17	.31**	.00	-.15	-.20*	.14	-.02
Dining Out-C	.12	.00	.10	.22*	.01	.09	--	-.01	-.09	-.07
Dining Out-P	.10	.05	-.02	.21*	.08	.13	.71**	-.05	-.12	-.01
Fruit-P	-.06	-.07	-.09	.02	.19*	.12	.04	-.02	.29**	-.03
Veggies-P	.20*	.28**	.20*	-.06	.06	-.14	-.05	.12	.07	.37**
FVSE	-.16	-.16	-.18*	-.01	.18*	.10	-.04	-.09	.16	.05
PASE-C	-.27**	-.24**	-.25**	-.12	.37**	.27**	-.02	-.02	-.01	.00
PASE-P	-.27**	-.24**	-.17	-.17	.35**	.25**	-.12	-.09	-.06	.02
CRE	.11	.08	.14	.04	-.13	.02	.18*	-.08	-.18	-.25**
PME	-.26**	-.26	-.23**	-.08	.21*	.13	-.22*	-.01	.19	.05
PAM	.32**	.32**	.30**	.09	-.33**	-.08	.15	.04	.01	.05
CFQPR	-.15	-.10	-.18*	-.10	.10	.05	-.15	-.10	-.06	.02
CFQWC	.18*	.12	.07	.21*	-.39**	-.29**	.05	.40**	.11	.06
CFQ Restriction	.18*	.20	.14	.03	-.36**	-.26**	.04	.18	-.03	.08
CFQ Pressure to eat	.09	.05	.12	.08	-.02	.09	.10	-.21*	.01	.04
CFQ Monitoring	.00	.03	.01	-.04	-.09	-.14	-.24**	.01	.02	-.08
PSDQ Regulation	.04	.02	.04	.04	.02	.11	-.03	-.01	.00	.06
PSDQ Connection	-.13	-.14	-.15	.01	.13	.20*	.07	-.12	.08	-.16
PSDQ Autonomy Granting	-.07	-.05	-.02	-.09	.04	.01	.11	-.02	.00	.13
PSDQ Authoritative	-.06	-.06	-.04	-.03	.06	.12	.08	-.08	.05	.02
PSDQ Physical Coersion	.11	.16	.11	-.04	-.05	.02	-.06	.12	.02	-.04
PSDQ Verbal Hostility	.16	.23**	.09	-.03	-.08	-.12	.07	-.03	.02	-.01
PSDQ Nonreasoning	.21*	.26**	.09	.06	-.10	.05	-.04	.12	.00	.11
PSDQ Authoritarian	.24*	.32**	.14	.00	-.12	-.03	-.00	.09	.02	.02
PSDQ Permissive	.17	.10	.07	.20*	-.07	-.07	.10	.07	-.02	-.03

Note. BMI=Body Mass Index, C=child, P=parent, PA=Physical Activity, FVSE=Fruit and Vegetable Self-Efficacy, PASE=Physical Activity Self-Efficacy, CRE=Child Resistance to Eating, PME=Positive Mealtime Environment, PAM=Parent Aversion to Mealtime, CFQ=Child Feeding Questionnaire, PR=Perceived Responsibility, WC=Weight Concerns, PSDQ=Parenting Styles and Dimensions Questionnaire. * <.05, ** ≤.001.

Table 13 Baseline Correlations for Parent Behaviors.

	Parent Screen Time	Parent TV	Parent Computer	Parent Video Games	Parent Days Active	Parent PA Time	Parent Dining Out	Parent BMI	Parent Fruit Intake	Parent Veggie Intake
BMI-P	.18*	.02	.22*	.13	-.22*	-.10	.12	--	-.09	-.04
Screen Time-P	--	.73**	.91**	.10	.03	.12	.10	.18*	.01	-.03
TV-P	.73**	--	.39**	-.03	-.02	.08	-.00	.02	-.07	.06
Computer -P	.91**	.39**	--	.05	.05	.11	.11	.22*	.06	-.08
Video Games -P	.01	-.03	.05	--	.07	.13	.23**	.13	-.01	.00
PA Days -P	.03	-.02	.05	.07	--	.48**	-.15	-.22*	.19*	.06
Family Dinner Nights	-.04	-.04	-.03	.01	.14	.14	.00	-.19*		
Dining Out-P	.10	-.00	.11	.23**	-.15	-.06	--	.12	-.03	-.06
Fruit-P	.01	-.07	.06	-.01	.19*	-.07	-.03	-.09	--	--
Veggies-P	-.03	.06	-.08	.00	.06	-.04	-.06	-.04	--	--
FVSE	.03	-.01	.05	-.03	.03	.06	-.06	.08	.28**	.05
PASE-C	-.09	-.12	-.04	.03	.20*	.16	.14	-.03	.06	-.11
PASE-P	-.09	-.06	-.08	-.06	.33**	.28**	-.08	-.21*	.07	-.09
CRE	.01	-.09	.07	.01	.01	.11	.20*	.12	-.11	.04
PME	-.04	-.07	-.01	-.14	.02	-.06	-.18*	-.02	.24*	-.20*
PAM	.03	.03	-.00	.19*	.02	.15	.12	.00	-.14	.28**
CFQPR	.03	.03	.03	-.04	.14	.15	-.14	-.15	.02	-.22*
CFQWC	.06	.02	.05	.22*	-.21*	-.10	.06	.36**	-.21*	-.06
CFQ Restriction	.06	.02	.04	.22*	-.09	-.02	.08	.09	-.29**	.24*
CFQ Pressure to eat	.17	.08	.17	.07	-.01	.10	.15	-.01	-.05	.00
CFQ Monitoring	-.05	-.02	-.04	-.08	-.02	.05	-.26**	-.12	-.09	.02
PSDQ Regulation	-.02	-.04	-.00	-.06	.14	.00	-.06	-.09	.06	.04
PSDQ Connection	.04	.09	.02	-.21*	.04	.03	-.02	.02	.08	-.23*
PSDQ Autonomy Granting	.04	-.02	.08	-.16	-.04	-.039	-.03	-.15	.05	.07
PSDQ Authoritative	.02	.00	-.04	-.16	.07	.24**	-.03	-.10	.09	-.01
PSDQ Physical Coersion	.03	.04	.00	.15	-.00	-.06	-.05	.12	-.07	.02
PSDQ Verbal Hostility	.02	.09	-.04	.09	-.15	.01	.12	-.01	-.03	.19*
PSDQ Nonreasoning	.32**	.34**	-.22*	.07	-.18*	.01	.05	.23*	-.16	.04
PSDQ Authoritarian	.18*	.22**	.10	.14	-.17	.07	.07	.15	-.12	.13
PSDQ Permissive	.25**	.23**	.19*	.15	-.22*	-.10	.18*	.21*	-.08	-.06

Note. BMI=Body Mass Index, C=child, P=parent, PA=Physical Activity, FVSE=Fruit and Vegetable Self-Efficacy, PASE=Physical Activity Self-Efficacy, CRE=Child Resistance to Eating, PME=Positive Mealtime Environment, PAM=Parent Aversion to Mealtime, CFQ=Child Feeding Questionnaire, PR=Perceived Responsibility, WC=Weight Concerns, PSDQ=Parenting Styles and Dimensions Questionnaire. * <.05, ** ≤.001.

APPENDIX B: RECRUITMENT MATERIALS



Participate in the Family Lifestyle Study

Learn more about factors that can
affect your family's health...

Participate online at your
convenience...

Contribute to research that may
help other families improve their
health and get back on track...

Contact us to learn more:

shayes@knights.ucf.edu
[www.psych.ucf.edu/
leah_programs.php](http://www.psych.ucf.edu/leah_programs.php)

Attention parents of children between the ages of 6 and 11 years old:

We live in a world that makes it very difficult to choose healthy food options and maintain an active lifestyle, and the Laboratory for the Study of Eating, Appearance, and Health (LEAH) understands how challenging it can be for parents to know if they are on the “right track” in keeping themselves and their family healthy. That is why LEAH is committed to conducting research to develop the most effective ways to help families in their efforts toward achieving a healthy lifestyle.

As part of a current research study, we are offering you the opportunity to receive **free personalized feedback** regarding your family’s eating behavior, activity level, and other health-related behaviors. You will also have the opportunity to earn \$20 in gift cards.

To learn more about this study, visit: http://www.psych.ucf.edu/leah_programs.php or e-mail: shayes@knights.ucf.edu

All information obtained, including identities, will remain completely confidential. This study has been approved by UCF’s Institutional Review Board and will be conducted by Sharon Hayes, a Clinical Psychology Doctoral Student, under the supervision of Dr. Stacey Tantleff Dunn, an Associate Professor of Psychology.

APPENDIX C: CHILD FEEDING QUESTIONNAIRE

1	2	3	4	5
Never	Seldom	Half the time	Most of the time	Always
<hr/>				
1. When your child is at home, how often are you responsible for feeding her?				
1	2	3	4	5
2. How often are you responsible for deciding what your child's portion sizes are?				
1	2	3	4	5
3. How often are you responsible for deciding if your child has eaten the right kind of foods?				
1	2	3	4	5
<hr/>				
1	2	3	4	5
Markedly underweight	Underweight	Normal	Overweight	Markedly overweight
<hr/>				
4. Your childhood (5- to 10-years-old)				
1	2	3	4	5
5. Your adolescence				
1	2	3	4	5
6. Your 20s				
1	2	3	4	5
7. At present				
1	2	3	4	5
8. Your child during the first year of life				
1	2	3	4	5
9. Your child as a toddler				
1	2	3	4	5
10. Your child as a preschooler				
1	2	3	4	5
11. Your child kindergarten through 2 nd grade				
1	2	3	4	5
12. Your child 3 rd through 5 th grade				
1	2	3	4	5
13. Your child 6 th through 8 th grade				
1	2	3	4	5
<hr/>				
1	2	3	4	5
Unconcerned	A little concerned	Concerned	Fairly concerned	Very concerned
<hr/>				
14. How concerned are you about your child eating too much when you are not around him/her?				
1	2	3	4	5
15. How concerned are you about your child having to diet to maintain a desirable weight?				
1	2	3	4	5

16. How concerned are you about your child becoming overweight?	1	2	3	4	5
	1	2	3	4	5
	Disagree	Slightly disagree	Neutral	Slightly agree	Agree
17. I have to be sure that my child does not eat too many sweets (candy, ice cream, cake, or pastries).	1	2	3	4	5
18. I have to be sure that my child does not eat too many high-fat foods.	1	2	3	4	5
19. I have to be sure that my child does not eat too many of his/her favorite foods.	1	2	3	4	5
20. I intentionally keep some foods out of my child's reach.	1	2	3	4	5
21. I offer sweets (candy, ice cream, cake, pastries) to my child as a reward for good behavior.	1	2	3	4	5
22. I offer my child his/her favorite foods in exchange for good behavior.	1	2	3	4	5
23. If I did not guide or regulate my child's eating, he/she would eat too many junk foods.	1	2	3	4	5
24. If I did not guide or regulate my child's eating, he/she would eat too much of his/her favorite foods.	1	2	3	4	5
25. My child should always eat all of the food on his/her plate.	1	2	3	4	5
26. I have to be especially careful to make sure my child eats enough.	1	2	3	4	5
27. If my child says "I'm not hungry," I try to get him/her to eat anyway.	1	2	3	4	5
28. If I did not guide or regulate my child's eating, she would eat much less than she should.	1	2	3	4	5
	1	2	3	4	5
	Never	Rarely	Sometimes	Mostly	Always
29. How much do you keep track of the sweets (candy, ice cream, cake, pies, pastries) that your child eats?	1	2	3	4	5
30. How much do you keep track of snack food (potato chips, Doritos, cheese puffs) that your child eats?	1	2	3	4	5
31. How much do you keep track of high-fat foods that your child eats?	1	2	3	4	5

APPENDIX D: ABOUT YOUR CHILD'S EATING

	1	2	3	4	5
	Never	Once in a while	Sometimes	Often	Nearly every time
1. My child hates eating.	1	2	3	4	5
2. I feel like a short-order cook because I have to make special meals for my child.	1	2	3	4	5
3. Meal times are among the most pleasant in the day.	1	2	3	4	5
4. I feel that it is a struggle or fight to get my child to eat.	1	2	3	4	5
5. My child refuses to eat.	1	2	3	4	5
6. I worry that my child will not eat right unless closely supervised.	1	2	3	4	5
7. My child is a picky eater.	1	2	3	4	5
8. The family looks forward to meals together.	1	2	3	4	5
9. My child enjoys eating.	1	2	3	4	5
10. Mealtime is a pleasant, family time.	1	2	3	4	5
11. I get pleasure from watching my child eating well and enjoying his/her food.	1	2	3	4	5
12. I dread meal times.	1	2	3	4	5
13. We have nice conversations during meals.	1	2	3	4	5
14. Meal times are the pits.	1	2	3	4	5
15. It is hard for me to eat dinner with my child because of how he/she behaves.	1	2	3	4	5
16. There are arguments between me and my child over eating.	1	2	3	4	5
17. My child seems to have no appetite.	1	2	3	4	5
18. My child has mealtime tantrums.	1	2	3	4	5
19. My child refuses to eat a planned meal.	1	2	3	4	5
20. I have to force my child to eat.					

- | | | | | | |
|--|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 21. I use preferred foods (such as desserts) as rewards or bribes to get my child to eat “good” foods. | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 22. We watch television during meals. | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 23. There are house rules about how much kids have to eat (for example, “the clean plate club”; No dessert until you eat what’s on your plate. | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 24. I have thought about putting my child on a diet. | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| 25. We end up grabbing meals whenever we can with no time for planning. | | | | | |
| | 1 | 2 | 3 | 4 | 5 |

APPENDIX E: PARENTING STYLES AND DIMENSIONS QUESTIONNAIRE

REMEMBER: For each item, rate how often you exhibit this behavior with your child.

I EXHIBIT THIS BEHAVIOR:

1 = Never

2 = Once In Awhile

3 = About Half of the Time

4 = Very Often

5 = Always

- _____ 1. I am responsive to my child's feelings and needs.
- _____ 2. I use physical punishment as a way of disciplining my child.
- _____ 3. I take my child's desires into account before asking him/her to do something.
- _____ 4. When my child asks why he/she has to conform, I state: because I said so, or I am your parent and I want you to.
- _____ 5. I explain to my child how I feel about the child's good and bad behavior.
- _____ 6. I spank when my child is disobedient.
- _____ 7. I encourage my child to talk about his/her troubles.
- _____ 8. I find it difficult to discipline my child.
- _____ 9. I encourage my child to freely express (himself)(herself) even when disagreeing with me.
- _____ 10. I punish by taking privileges away from my child with little if any explanations.
- _____ 11. I emphasize the reasons for rules.
- _____ 12. I give comfort and understanding when my child is upset.
- _____ 13. I yell or shout when my child misbehaves.
- _____ 14. I give praise when my child is good.
- _____ 15. I give into my child when the child causes a commotion about something.
- _____ 16. I explode in anger towards my child.
- _____ 17. I threaten my child with punishment more often than actually giving it.
- _____ 18. I take into account my child's preferences in making plans for the family.
- _____ 19. I grab my child when being disobedient.
- _____ 20. I state punishments to my child and do not actually do them.
- _____ 21. I show respect for my child's opinions by encouraging my child to express them.
- _____ 22. I allow my child to give input into family rules.

I EXHIBIT THIS BEHAVIOR:

1 = Never

2 = Once In Awhile

3 = About Half of the Time

4 = Very Often

5 = Always

- _____ 23. I scold and criticize to make my child improve.
- _____ 24. I spoil my child.

- _____ 25. I give my child reasons why rules should be obeyed.
- _____ 26. I use threats as punishment with little or no justification.
- _____ 27. I have warm and intimate times together with my child.
- _____ 28. I punish by putting my child off somewhere alone with little if any explanations.
- _____ 29. I help my child to understand the impact of behavior by encouraging my child to talk about the consequences of his/her own actions.
- _____ 30. I scold or criticize when my child's behavior doesn't meet my expectations.
- _____ 31. I explain the consequences of the child's behavior.
- _____ 32. I slap my child when the child misbehaves.

APPENDIX F: 24 HOUR FOOD RECALL

For this section, please let us know what you and your child ate and drank yesterday (a 24-hour period). We just want to know what you actually consumed. If you are uncertain about what your child ate, please estimate to the best of your ability in the last question on the page.

Also, if your child was not in your care yesterday, please provide an "example day" of what he or she would typically have in your care in the last question on the page.

Please include the brand and quantity of what you ate and drank.

Our ability to provide you with helpful feedback relies on your accuracy and detail. Therefore, we really appreciate the extra time you take to complete these questions.

Response examples:

Instead of saying that you had pasta, say you had: 1 cup of elbow macaroni with 1/4 cup Ragu Old World Style tomato sauce and approximately 2 tablespoons of parmesan cheese (or for your child, perhaps he or she had 1 cup of ready-cut noodles with 1 tablespoon of margarine or butter and 2 tablespoons of parmesan cheese)

Instead of saying that you had a foot-long sub, say you had: 1 foot-long Publix sub on Italian bread (Boar's head salami, ham, turkey breast, provolone cheese, mayonnaise, mustard, lettuce, tomato, pickles, olives), a small bag of "Dirty Chips" (salt & vinegar), and a large Sprite.

Instead of saying you had a Big Mac meal, say you had: McDonald's Big Mac meal (large size with fries and Diet Coke)

Instead of saying you had a chocolate bar, say you had: 1 regular size Snicker's bar

Instead of saying you had 2 slices of pizza, say you had: 2 slices of thin crust pepperoni pizza with mushrooms, onions, extra cheese (from a large Pizza Hut pizza)

Instead of saying you had chicken breast and pasta salad, say you had: 3 oz of chicken breast, 2 tablespoons of Italian dressing, 1 cup of tri-color rotini pasta, 12 oz water, and small strawberry smoothie from Smoothie King (nothing added)

Instead of saying you had 2 tacos, say you had: 2 beef tacos from Taco Bell with sour cream, a side of refried beans and rice, and a large regular Coke.

Instead of saying you had some cookies, say you had: 2 large homemade chocolate chip cookies OR 5 Oreos.

Start with the most recent meal, drink, or snack that you consumed today and work your way back for 24 hours.

We understand that you might not be aware of exactly what your child consumed, but please estimate to the best of your ability rather than leaving any part blank. It is important to include as much detail as possible and not omit anything as this information will be used in your feedback report.

You should not feel embarrassed about anything that you consumed as there are no "good" or "bad" foods and no "right" or "wrong" responses. Please provide as much detail as you can about what you ate (e.g., the type of bread [whole wheat, Italian, etc.], snack pack size, product brand, etc.). The more information you provide the better. If you know the portion size you consumed, please include that.

1 cup looks like a whole baseball

1/2 cup looks like half a baseball

3 oz of meat is about the size of a deck of cards or the palm of your hand

2 tablespoons of peanut butter looks like a golf ball

1.5 oz of cheese is about the size of three dominos

With regard to beverages, please be as specific as possible. If you are uncertain, please be as descriptive as possible (e.g., coffee cup, travel mug, very tall glass, juice glass, sippy cup, etc.).

1. The following questions ask you to detail what YOU had to eat and drink YESTERDAY. If you did not eat during a particular time, please write "N/A" or "nothing."

Also, if yesterday is not a good representation of how you normally eat (i.e., more days than not), please choose a day this week that more accurately reflects your typical diet.

Is yesterday representative of the types of food and beverages you normally consume? An example of a non-typical day would be Thanksgiving or a day that you were on vacation or attended a party that had lots of foods you would normally not eat.

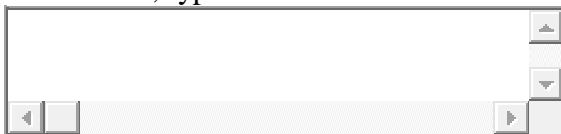
Yes, yesterday is a representative day and my answers reflect what I ate and drank yesterday.

No, yesterday is not a good example of how I normally eat and drink. I will provide an example of a "typical" day rather than yesterday.

2. Think about what YOU ate and drank last night after dinner. In the box below, please type the foods and/or beverages you consumed in the evening after dinner.

Be as specific as possible regarding the amount, brand, etc.

Do not include dinner here. List your dinner in the next question. If you did not have anything after dinner, type "N/A" here.

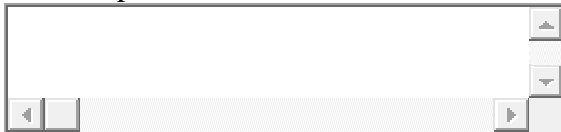


3. Please list what you had for dinner last night (include foods and beverages).

Be sure to include beverages, condiments (e.g., mayo), and anything else you added to any food or beverage (e.g., 2% milk in coffee, about a 1/4 cup of shredded cheddar cheese to a salad, etc.). Note the quantity when possible. If you are uncertain of ounces, etc., estimate as best you can using your own language (e.g., a splash of milk).



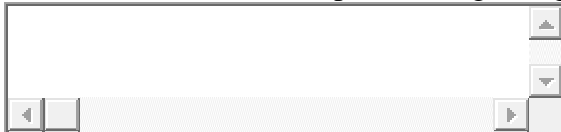
4. Please list what you had to eat or drink between lunch and dinner yesterday. Include as much detail as possible.



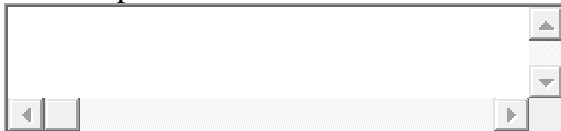
5. Please list all of the foods and beverages you had for lunch yesterday. Include as much detail as possible.



6. Please list all of the foods and beverages you had between breakfast and lunch yesterday. Include as much detail as possible regarding brand, size, quantity, etc.



7. Please list all of the foods and beverages you had for breakfast yesterday. Include as much detail as possible.



8. We would like you to review your answers above. Please list any details you may have missed that will allow us to provide accurate feedback.

For example, if you said "cereal," be sure to say exactly which brand and type, how many ounces or cups, and how many servings (e.g., two bowls). If you used milk, specify how much (e.g., 1.5 cups, 3 cups) and the type (e.g., whole, 2%, 1% skim, soy, etc.). If you said "some cookies," specify the type, size, and quantity.

I reviewed my responses for my meals, snacks, and beverages yesterday. I have included as much detail as possible regarding the brands, sizes, quantities, etc. I am satisfied with the accuracy and completeness of my responses.

I did not review my responses above for accuracy and completeness.

*This survey was then repeated for child.

APPENDIX G: STAGE OF CHANGE MEASURES

Please review the examples below of moderate and vigorous physical activity.

Moderate activity (Adults)	Vigorous activity (Adults)
<p>Walking at a moderate or brisk pace of 3 to 4.5 mph on a level surface inside or outside, such as</p> <ul style="list-style-type: none"> • Walking to class, work, or the store • Walking for pleasure • Walking the dog • Walking as a break from work <p>Walking downstairs or down a hill Racewalking—less than 5 mph Using crutches Hiking Roller skating or in-line skating at a leisurely pace</p>	<p>Racewalking and aerobic walking—5 mph or faster Jogging or running Wheeling your wheelchair Walking and climbing briskly up a hill Backpacking Mountain climbing, rock climbing, rappelling Roller skating or in-line skating at a brisk pace</p>
<p>Bicycling 5 to 9 mph, level terrain, or with few hills Stationary bicycling—using moderate effort</p>	<p>Bicycling more than 10 mph or bicycling on steep uphill terrain Stationary bicycling—using vigorous effort</p>
<p>Aerobic dancing—high impact Water aerobics</p>	<p>Aerobic dancing—high impact Step aerobics Water jogging Teaching an aerobic dance class</p>
<p>Calisthenics—light Yoga Gymnastics General home exercises, light or moderate effort, getting up and down from the floor Jumping on a trampoline Using a stair climber machine at a light-to-moderate pace Using a rowing machine—with moderate effort</p>	<p>Calisthenics—push-ups, pull-ups, vigorous effort Karate, judo, tae kwon do, jujitsu Jumping rope Performing jumping jacks Using a stair climber machine at a fast pace Using a rowing machine—with vigorous effort Using an arm cycling machine—with vigorous effort</p>
<p>Weight training and bodybuilding using free weights, Nautilus- or Universal-type weights</p>	<p>Circuit weight training</p>
<p>Boxing—punching bag</p>	<p>Boxing—in the ring, sparring Wrestling—competitive</p>
<p>Ballroom dancing Line dancing Square dancing Folk dancing Modern dancing, disco Ballet</p>	<p>Professional ballroom dancing—energetically Square dancing—energetically Folk dancing—energetically Clogging</p>

Table tennis—competitive Tennis—doubles	Tennis—singles Wheelchair tennis
Golf, wheeling or carrying clubs	—
Softball—fast pitch or slow pitch Basketball—shooting baskets Coaching children’s or adults’ sports	Most competitive sports Football game, Basketball game, Wheelchair basketball, Soccer, Rugby, Kickball, Field or rollerblade hockey, Lacrosse

Do you regularly get at least 30 minutes of moderate activity per day or 30 minutes of vigorous activity three or more days per week?

- Yes, I have been that active for MORE than 6 months.
- Yes, I have been that active for LESS than 6 months.
- No, but I intend to in the next 30 days.
- No, but I intend to in the next 6 months.
- No, and I do not intend to in the next 6 months.

For children, Examples of moderate activities include things like a brisk walk, a bike ride, skateboarding, dancing, or any sort of active play (e.g., tag).

More vigorous activities will make kids “huff and puff” and include organized sports such as football and volleyball, as well as activities such as ballet, running and swimming laps. Children typically accumulate activity in intermittent bursts ranging from a few seconds to several minutes, so any sort of active play will usually include some vigorous activity.

2. Does your child regularly get at least 60 minutes per day of moderate to vigorous activity per day?

- Yes, I have ensured that he/she has been that active for MORE than 6 months.
- Yes, I have ensured that he/she has been that active for LESS than 6 months.
- No, but I intend to ensure that he/she begins in the next 30 days.
- No, but I intend to ensure that he/she begins in the next 6 months.
- No, and I do not intend to ensure that he/she begins in the next 6 months.

Please review the following images to see examples of what counts as 1 cup and ½ cup of fruits or vegetables:

EXAMPLES OF 1 CUP



1 small apple



1 large orange



2 large or 3 medium plums



1 medium potato



12 baby carrots
(or 2 medium carrots)

1 large banana



1 medium pear



8 large strawberries



2 large stalks of celery



1 large sweet potato

1 medium grapefruit



1 small wedge watermelon



1 large bell pepper



1 cup cooked greens or 2 cups
raw (spinach, collards, mustard
greens, turnip greens)



1 large ear of corn

EXAMPLES OF 1/2 CUP



1 snack container of applesauce (4oz)



16 grapes



1 medium cantaloupe wedge



1/2 medium grapefruit



4 large strawberries



5 broccoli florets



6 baby carrots



1 large plum



1 small box (1/4 cup) of raisins

1/2 cup of 100% fruit juice (4 oz)

Do YOU regularly eat at least 2 to 2.5 cups of vegetables AND 1.5 to 2 cups of fruit per day?

Yes, I have eaten that much for MORE than 6 months.

Yes, I have eaten that much for LESS than 6 months.

No, but I intend to in the next 30 days.

No, but I intend to in the next 6 months.

No, and I do not intend to in the next 6 months

Does your child regularly eat at least 2 to 2.5 cups of vegetables and 1.5 cups of fruit per day?

Yes, I have ensured that he/she has eaten this much for MORE than 6 months.

Yes, I have ensured that he/she has eaten this much for LESS than 6 months.

No, but I intend to ensure that he/she begins in the next 30 days.

No, but I intend to ensure that he/she begins in the next 6 months.

No, and I do not intend to ensure that he/she begins in the next 6 months

APPENDIX H: SELF-EFFICACY MEASURES

How confident are you in your ability to ensure that you and your child get the recommended amount of moderate to physical activity described in the two previous questions under the following circumstances?

- | | | | | |
|------------------------------|----------------------------|------------------------------|---------------------|------------------------------|
| Not at all
confident
1 | Somewhat
confident
2 | Moderately
confident
3 | Very confident
4 | Completely
Confident
5 |
|------------------------------|----------------------------|------------------------------|---------------------|------------------------------|
- When I am under a lot of stress _____
- When I feel I don't have a lot of time _____
- When I have to do it by myself _____
- When I don't have access to exercise equipment _____
- When I am spending time with friends/family who do not exercise or get the recommended amount of physical activity _____
- When it is raining, snowing, or very hot _____
- When my child would rather watch television or play a computer/video game _____
- When my child just wants to "relax" _____
- When my child feels like they don't have a lot of time _____
- When my child doesn't have any friends around with whom to engage in physical activity (play) _____
- When my child says he or she doesn't like playing sports, playing outside, or otherwise engaging in physical activity _____

How confident are you in your ability to ensure that you and your child get the recommended amount of fruits and vegetables described in the two previous questions under the following circumstances?

- | | | | | |
|------------------------------|----------------------------|------------------------------|---------------------|------------------------------|
| Not at all
confident
1 | Somewhat
confident
2 | Moderately
confident
3 | Very confident
4 | Completely
Confident
5 |
|------------------------------|----------------------------|------------------------------|---------------------|------------------------------|
- When I am under a lot of stress _____
- When I feel I don't have a lot of time _____
- When I am too tired to make food myself _____
- When other foods are tempting _____
- When I am spending time with friends/family who do not eat the recommended amount of fruits and vegetables _____
- When I/we are eating out at a restaurant _____
- When my child gives me a hard time/refuses to eat fruits and vegetables _____
- When my child doesn't like the fruits or vegetables I serve _____
- When my child's schedule keeps us very busy _____
- When I don't feel like going to the grocery store _____
- When money is tight _____

APPENDIX I: PHYSICAL ACTIVITY SURVEY

Please list or describe your child's favorite activities (i.e., What does he or she like to do the most?). Be sure to tell us how often and for how long your child gets to actually participate in these activities.

For example, "Molly loves to play soccer for one hour three times per week." Or, "Molly really loves to draw or paint for about an hour every day."



How many days per week do you feel like your child is physically active? Children may engage in a number of active behaviors. For example, they may play games like tag or Wii Sports, participate in classes like dance or gymnastics, play sports like football or soccer, or engage in activities like bike riding, skateboarding, or rollerblading? There are also other ways to be active (i.e., think about anything that gets them up and moving for a period of time).

- None (0)
- 1
- 2
- 3
- 4
- 5
- 6
- Everyday (7)

Please list the activities that your child engages in most often that you consider to be physically active. Please note how long he or she spends engaged in these activities.

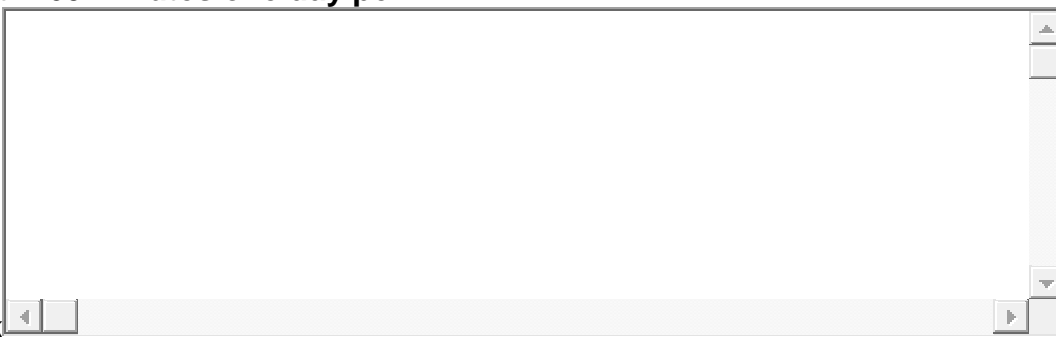
For example:

riding her bike -- 45 minutes at least 3 times per week

playing with other kids outside -- 1 hour two days per week

ballet -- 60 minutes one day per

week



Please estimate the total amount of time your child spends being physically active in a typical week.

Hours

Minutes

How many days per week are YOU physically active? Adults may engage in a number of active behaviors, too. For example, they may have jobs that require them to exert a lot of energy (e.g., some positions in food service and grocery, construction). Others may be active by doing yard work (e.g., mowing grass, planting flowers) or engaging in formal exercises (e.g., going to the gym, running, biking, aerobics).

- None (0)
- 1
- 2
- 3
- 4
- 5
- 6
- Everyday (7)

Please list the activities that YOU engage in most often that you consider to be physically active. Please note how long you spend engaged in these activities. For example, "walking -- 2 days per week for 30 minutes," "gardening once per week for 2 hours,"

etc.

Please estimate the total amount of time you spend being physically active in a typical week.

Hours

Minutes

Is your job primarily sedentary (i.e., I sit most of the day and am generally not physically active at work) or primarily active (i.e., My job keeps me moving throughout the day. For example, I may lift and move items frequently, and I am on my feet most of the day. I definitely feel like I am physically active at work.).

- My job is primarily sedentary
- My job is primarily active

What is your occupation/job

title?

APPENDIX J: DECISIONAL BALANCE EXERCISE

To change, the scale needs to tip so the costs outweigh the benefits. This is called Decisional Balancing.

Weighing the pros and cons of changing happens all the time. For example, when changing jobs or deciding to move or get married.

Thinking about changing?

Ask yourself: **What do I stand to lose and gain by continuing my current behavior?**

At some point, you may have received real benefits from the behavior you want to change, such as relaxation, fun, or stress reduction.

Decision to Change

One thing that helps people when thinking of changing is to list the benefits and costs of changing or continuing their current behavior. Below is an example:

EXAMPLE (Your costs and benefits will likely look different depending on the behavior you choose. Some items may be the same, but please try your best to personalize your list as much as possible).

	Changing	Not Changing
Benefits of	<ul style="list-style-type: none"> • More energy • Improved mood • Improved health • More active with family and friends 	<ul style="list-style-type: none"> • More time to work • More time to watch television/play video games • Won't be sore
Costs of	<ul style="list-style-type: none"> • Stress over finding time • Spend money to buy appropriate clothes and/or equipment • Embarrassed to have others see me 	<ul style="list-style-type: none"> • Increased health risks • Kids follow my example • Poor sleep • Continued weight gain

Decision to Change: It's Your Turn

The person above chose "physical activity" as the behavior that they wanted to change. Think about your family's current lifestyle behaviors as they relate to eating behavior and physical activity.

Fill in the costs and benefits of changing and compare them. Ask yourself: are the costs worth it?

1. What changes would you like to make for your family?

2. List the Benefits of Changing

3. List the Benefits of Not Changing

4. List the Costs of Changing

5. List the Costs of Not Changing

It's Your Decision.

The next item asks you to list the most important reasons why you want to change. You are the one who must decide what it will take to tip the scale in favor of change.

6. The most important reason I want to change is:

APPENDIX K: DEMOGRAPHIC QUESTIONNAIRE

Please provide the following information about yourself and your child. All information will remain confidential and anonymous.

Your sex M F

Other parent or guardian's sex M F

Your Age _____

Your height _____

Your weight _____

Other parent or guardian's age _____

Mother's Race (Please circle) African American Asian Caucasian Hispanic Biracial Other

Father's Race (Please circle) African American Asian Caucasian Hispanic Biracial Other

Child's Age _____

Child's Race: African American Asian Caucasian Hispanic Biracial Other

Your child's height (please estimate if uncertain) _____

Are you confident in your estimate of your child's height? Yes No

Your child's weight (please estimate if uncertain) _____

Are you confident in your estimate of your child's weight? Yes No

Child's Year in school (Please circle)

kindergarten 1 2 3 4 5 6 other _____

How many children (biological, adopted, or step) do you have? _____

How many of your children live with you full-time? _____

What is your current marital status? (select one)

Married

Not Married

Divorced

Separated

Widowed

What is your annual household income (before taxes – please estimate if you are uncertain)? \$25,000 or less \$25,001 to 40,000 \$40,001 to 55,000

\$55,001 to 70,000 \$70,001 to 85,000 \$85,001 to 100,000

\$100,001 and above

How did you hear about this study? _____

Do you have any physical disabilities or illnesses that prevent obtaining physical activity or exercise? Yes No

If yes, please tell us more about these condition(s):

Does your child have any physical disabilities or illnesses that prevent obtaining physical activity or exercise? Yes No

If yes, please tell us more about these condition(s):

Do you experience any medical complications due to obesity? Yes No

If yes, please tell us more about these medical complications:

Does your child experience any medical complications due to obesity? Yes No

If yes, please tell us more about these medical complications:

Are you satisfied with the amount of time you spend with your child? Yes No

Are you satisfied with the quality of the time you spend with your child? Yes No

How many hours per week do YOU watch television (please estimate to the best of your ability and think of each day of the week Mon-Sun before providing your weekly total)? _____

How many hours per week do YOU spend online or on the computer (please estimate to the best of your ability and think of each day of the week Mon-Sun before providing your weekly total)?

How many hours per week do YOU play video games or other games that do not involve physical activity (please estimate to the best of your ability and think of each day of the week Mon-Sun before providing your weekly total)? _____

How many hours per week does your CHILD watch television (please estimate to the best of your ability and think of each day of the week Mon-Sun before providing your weekly total)?

How many hours per week does your CHILD spend online or on the computer? (please estimate to the best of your ability and think of each day of the week Mon-Sun before providing your weekly total)? _____

How many hours per week does your CHILD play video games or other games that do not involve physical activity (please estimate to the best of your ability and think of each day of the week Mon-Sun before providing your weekly total)? _____

We are interested in learning more about your family. For the following questions, please think about a typical or average week in your household.

For the following questions, **fast food** is defined as any restaurant that has a drive-thru and/or a walk-up window. These restaurants typically serve premade foods that can be special ordered (please note that you may dine in many of these restaurants). Some examples include: McDonald's, Burger King, Wendy's, Taco Bell, Kentucky Fried Chicken, Chic-fi-la, Steak 'n Shake, Hardee's, Long John Silvers, Pizza Hut, Checkers, Arby's, Fazioli's, Krystal's, Dunkin Dounuts, etc.

Additionally, some examples of **casual dine-in or to-go** restaurants include: Chili's, Applebee's, T.G.I. Friday's, Longhorn Steakhouse, Macaroni Grill, Denny's, Pei Wei, Red Lobster, Alehouse, Jonny Rocket's, Cheeburger Cheeburger, Tijuana Flats, Chinese take-out/delivery, etc.

When you eat fast food, where you do typically eat and what do you typically order (please include details including size and they type of drink ordered)?

Self:

Child:

In a typical week, how many days per week do YOU eat fast food?

0 1 2 3 4 5 6 7

In a typical week, how many days does your CHILD eat fast food?

0 1 2 3 4 5 6 7

Please select the one factor that contributes most to increases in your or your child's fast food consumption.

Time (it's quick)

Taste (it's tasty)

Money (it's inexpensive)

Preference (it's what we like to eat the most)

Convenience (it's easy)

Other: _____

If it can't be microwaved or bought ready-to-go, I can't make it.
When I eat "healthy" I feel like my diet is very restricted.
I feel bad if I don't allow my child to eat things that might taste good but are not really nutritious.
I know what foods/drinks are healthy and what is not.
I know what a healthy serving size looks like.
My family would not benefit from receiving information about healthy eating.
Drinking 100% juice is just as good as eating fruit.
Fiber is something only older individuals and people with gastrointestinal problems need to worry about.
I am as physically active as I want my child to be.
My family would not benefit from learning more about physical activity and healthy lifestyle habits.
I often drive around until I find a close parking spot.
My family could stand to watch less television.
When I can (i.e., without luggage, stroller, etc.), I take the stairs instead of the elevator or escalator.
I often play active games with my child (i.e., games that increase my heart rate, breathing, and possibly perspiration).
Instead of walking through the entire mall, I would drive from one end to the other.
I can't stand going to the gym.
We get a lot of enjoyment from our favorite television shows.
I drive from store to store when shopping at a large outdoor shopping center.
I wish my child would spend less time on the computer or playing video games.

The following questions are meant for us to learn more about your family. You may write as little or as much as you like. There is no right or wrong way to answer to any question. (INTERVENTION ONLY)

How would you describe your relationship with your child?

How do you think your lifestyle habits and behaviors affect your child?

If you are currently dissatisfied with your family's diet or amount of physical activity, what would it take for you to make changes?

APPENDIX L: IRB NOTIFICATION LETTER



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

Notice of Expedited Initial Review and Approval

From : UCF Institutional Review Board
FWA00000251, Exp. 10/8/11, IRB00001138

To : Sharon Hayes

Date : March 25, 2009

IRB Number: SBE-09-06155

Study Title: **Evaluating a personalized family-based intervention to promote healthy lifestyle changes**

Dear Researcher:

Your research protocol noted above was approved by expedited review by the UCF IRB Vice-chair on 3/24/2009. **The expiration date is 3/23/2010.** 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 surveys, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The IRB has approved a waiver of documentation of consent 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. For online surveys, please advise participants to print out the consent document for their files.

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 03/25/2009 03:12:24 PM EST

APPENDIX M: FAMILY EATING AND ACTIVITY HABITS QUESTIONNAIRE

(Please refer your answers to questions 1-4 to yourself, your spouse, and your 6- to 11-year-old child)

1. How many hours per week on average do you watch television and/or play computer games?
 Mother: _____ Father: _____ Child: _____

2. How many hours per week on average do you engage in the following activities?

	Mother	Father	Child
Ride bicycles			
Take walk			
Swim			
Do gymnastics			
Dance			
Play tennis			
Other:			

3. How many hours per week on average do you attend leisure time classes (including exercise classes)? (if none, write 0)

Mother: _____ Father: _____ Child: _____

4. When you are alone and are not busy, do you get bored?

Mother:	Never	Sometimes	Frequently	Always
Father:	Never	Sometimes	Frequently	Always
Child:	Never	Sometimes	Frequently	Always

In modern society, people often skip meals, do with snacks instead of proper meals, or eat irregularly, or depending on their mood. The following questions are related to the types of foods you and your family eat, and your eating behavior. (Circle appropriate items.)

5. How many of the following snacks are usually found in your home?

Cheetos, Pretzels, Potato Chips, Ruffles, Popcorn, Sunflower seeds, Peanuts, Almonds, Pistachios, Nuts, Other: _____.

6. How many of the following types of sweets are usually found in your home?

Chocolate and chocolate bars, Candy, Wafers, Cookies, Jam, Other: _____.

7. How many types of cake are usually found in your home? _____

8. How many types of ice-cream and popsicles are usually found in your home? _____

9. During the weekend, do you add more of the foods listed in 5-8.

0 Don't add

1 Add

10. You usually keep the snacks and sweets in your home in

0 A hiding place

1 Known but not seen place

2 Reachable place

11. To what degree can your child eat snacks and/or sweets without your permission?

0 Never

1 Almost never

2 Sometimes

3 Frequently

4 Always

12. How frequently does your child buy his/her own sweets?

0 Never

1 Almost never

2 Sometimes

3 Frequently

4 Always

13. When your child asks to eat, does he/she claim to be hungry?

0 Yes

1 No

14. Usually when the child eats:

1 He/she asked for it

2 The food was offered by the mother/father

15. If it is meal time and your child is not hungry, how would you respond?

0 You suggest that the child will eat later

1 You suggest that the child sit at the table with the family but would not eat

2 You suggest that the child sit at the table with the rest of the family but would eat less

3 You convince the child to eat with the rest of the family

4 This is an irrelevant question, the child is always hungry

16. When it is meal time and you are not hungry what would you do? (Both parents)

Mother: 0 Not eat Father: 0 Not eat

1 Eat less 1 Eat less

2 Eat the same 2 Eat the same

3 It never happens 3 It never happens

Frequently, we just grab something to eat, or eat under certain conditions or moods. (Please refer your answer to questions 17-20 to yourself, your spouse and your child)

17. How frequently do the following behaviors occur for each family member:

	Never	Almost Never	Sometimes	Frequently	Always
MOTHER	0	1	2	3	4
Eat while standing					
Eat straight from the pot/baking pan/bowl/frying pan					
Eat while watching television, reading, working					
Eat when bored					
Eat in disorderly way during the afternoon					
Eat late in the evening or at night					
FATHER	Never	Almost Never	Sometimes	Frequently	Always
	0	1	2	3	4
Eat while standing					
Eat straight from the pot/baking pan/bowl/frying pan					
Eat while watching television, reading, working					
Eat when bored					
Eat in disorderly way during the afternoon					
Eat late in the evening or at night					
CHILD	Never	Almost Never	Sometimes	Frequently	Always
	0	1	2	3	4
Eat while standing					
Eat straight from the pot/baking pan/bowl/frying pan					
Eat while watching television, reading, working					
Eat when bored					
Eat in disorderly way during the afternoon					
Eat late in the evening or at night					

In many houses eating is not limited to the dining room or kitchen.

18. How often do you eat in the following rooms? (If you do not have such a room in the house, please enter n/a)

	Never	Almost Never	Sometimes	Frequently	Always
MOTHER	0	1	2	3	4
Living room/TV room					
Bedroom					
Office					
FATHER	0	1	2	3	4
Living room/TV room					
Bedroom					
Office					
CHILD	0	1	2	3	4
Living room/TV room					
Bedroom					
Office					

19. Compared to other people your age, how would you rate your eating pace:

Mother: 1 Slow 2 Average 3 Fast
 Father: 1 Slow 2 Average 3 Fast
 Child: 1 Slow 2 Average 3 Fast

20. How often do you customarily ask for or take a second helping?

Mother: 0 Never 1 Almost never 2 Sometimes 3 Frequently 4 Always
 Father: 0 Never 1 Almost never 2 Sometimes 3 Frequently 4 Always

21. How often do you or your spouse eat with the child?

Breakfast: 0 Always 1 Frequently 2 Sometimes 3 Almost never 4 Never
 Lunch: 0 Always 1 Frequently 2 Sometimes 3 Almost never 4 Never
 Afternoon snack: 0 Always 1 Frequently 2 Sometimes 3 Almost never 4 Never
 Dinner: 0 Always 1 Frequently 2 Sometimes 3 Almost never 4 Never

APPENDIX N: SAMPLE FEEDBACK REPORT

WEIGHT AND BODY MASS INDEX

DID YOU KNOW?

In the United States alone, 33% of children aged 6 to 11 are overweight or obese. Twice as many adults are overweight or obese (66%).

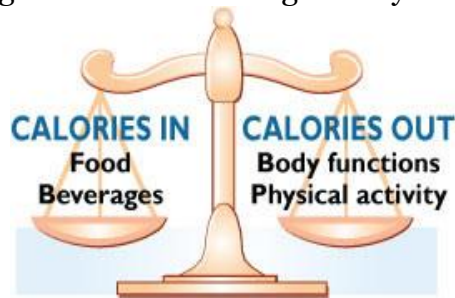
One way to determine whether your weight is within a healthy range is to calculate your "body mass index" (BMI). For most people, BMI is a reliable indicator of body fatness. It is calculated based on your height and weight. For children and teens, BMI is age and sex-specific and is often referred to as BMI-for-age. It is presented in terms of percentile rank.

For children, the healthy range falls between the 5th and 85th percentiles.

For adults, the healthy range falls between BMI of 18.5 and 24.9.

CHILD's weight falls within the healthy range (77th percentile). This likely has a lot to do with all the physical activity he gets! You are also doing a great job of helping him adopt healthy habits like eating fruits & veggies! These habits will help to keep his weight in a normal range.

MOTHER, your weight corresponds with a BMI of 24.9, which falls within the high end of the healthy range. You are doing a great job (and setting a great example) by being physically active and making choices like making water your primary beverage!



If you want to ...	Your caloric balance status should be...
Maintain your weight	"In balance." You should eat roughly the same number of calories that your body is using. Your weight will remain stable.
Gain weight	"In caloric excess." You should eat more calories than your body is using. You will store these extra calories as fat and you'll gain weight.
Lose weight	"In caloric deficit." You should eat fewer calories than you are using. Your body will pull from its fat storage cells for energy, so your weight will decrease.

ACTIVITY

It can be helpful to look at our environment to help determine what factors might contribute to becoming or maintaining overweight.

CHILD:

Screen Time (TV, Computer, Video Games)	35 hrs/wk	
Actual Physical Activity (moderate & vigorous)	10-15 hrs/wk	
<i>Recommended</i> Amount of Physical Activity (60 minutes per day)	7 hrs/wk	

You are doing a great job ensuring CHILD stays physically active! Be sure to monitor that screen time! What do you think you and CHILD could do to reduce it even by just 1-2 hours per week?

MOTHER:

Screen Time (TV, Computer, Video Games)	70 hrs/wk	
Actual Physical Activity (moderate & vigorous)	10 hrs/wk	
<i>Recommended</i> Amount of Physical Activity (vigorous: 30 min/3xwk or mod: 30 min/daily)	1.5 (vig) or 3.5 (mod) hrs/wk	

Nice job with physical activity! Physical activity is not only a great way to lose and maintain weight losses, but it is also associated with a number of positive health outcomes such as decreased risk for cardiovascular disease. So, you are not only taking good care of yourself, you are setting a great example for CHILD. Finding time in the day to care for oneself is not always easy, but research tells us that it can actually help you to be a better and more patient parent ☺ Keep it up! Be sure to monitor your screen time.

DID YOU KNOW?

It is recommended that ALL adults get 30 minutes of moderate activity everyday or 30 minutes of vigorous activity three days per week. For ALL kids, 60 minutes of moderate to vigorous activity per day is recommended.

Most weight loss occurs because of decreased caloric intake. However, evidence shows the only way to *maintain* weight loss is to be engaged in regular physical activity.

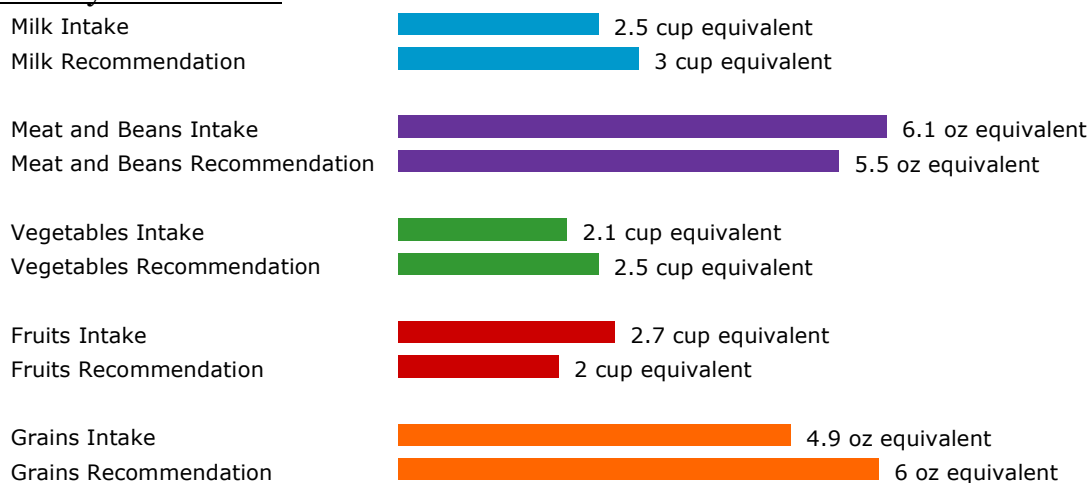
The American Pediatric Association recommends that children watch no more than 1-2 hours of

television per day (7-14 hours per week). Research indicates that excessive television viewing (3 hours or more per day) is associated with increased BMI and body fat percentage.

NUTRITION

Activity is just one part of a balance that affects our weight.
The foods we eat are the other part.

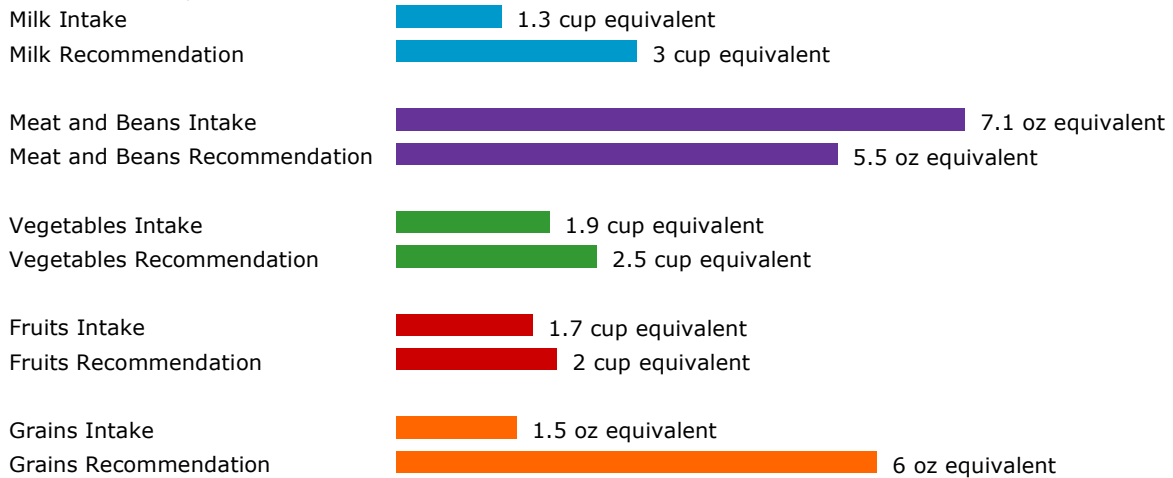
CHILD's Pyramid Stats



Dietary Guidelines Recommendations	Emoticon	Amount Eaten	Recommendation or Goal
Total Fat	😊	30.2% of total calories	25% to 35%
Saturated Fat	😊	10.7% of total calories	less than 10%
Cholesterol	😊	210 mg	less than 300 mg
Sodium	😞	3029 mg	less than 2300 mg
Food Energy/Total Calories	😊	2082	2010
Fiber	😞	13	31

CHILD's food record was created using the USDA website, www.mypyramid.gov. From the snapshot of his intake based on your report, it looks like you are doing a great job across the board!!! Although CHILD's fruits & veggies look high, it is important to note that mypyramid.gov counts things like juice toward your fruit servings and mashed potatoes and french fries as veggies. Whole fruits (vs. juices) and veggies (vs. modified veggies like fries or other veggies that have "stuff" added to them) will help to increase CHILD's fiber intake, too!

MOTHER's Pyramid Stats



Dietary Guidelines Recommendations	Emoticon	Amount Eaten	Recommendation or Goal
Total Fat	😊	32.9% of total calories	20% to 35%
Saturated Fat	😊	9.5% of total calories	less than 10%
Cholesterol	😊	229 mg	less than 300 mg
Sodium	😊	2016 mg	less than 2300 mg
Food Energy/Total Calories	😐	1268	1917
Fiber	😞	11	25

First, congratulations on not consuming too many fats, cholesterol, and sodium! You are also doing a nice job of staying within an ideal calorie range, but you might want to aim just a bit higher (minimum of 1500) . Consider using 1% or skim milk (and choose low- or no-fat cheeses, yogurts, etc.) to continue to keep fat & saturated fat intake low.

Some personalized recommendations...

- Continue to vary sources of meat & bean/protein intake (i.e., animal protein vs. beans, nuts, and other sources like hummus, cheese, and yogurt). 4 oz is the ideal serving size of animal proteins like chicken and beef. Be sure to continue to choose lean proteins. Believe it or not, protein can be found in other foods too like yogurt (especially Greek yogurt) and cheese.
- Be creative in how you consume more fiber and don't make assumptions about the types of food you will need to eat! One cup of raspberries actually has more fiber (8 grams) than one cup of cooked whole wheat spaghetti (6.3 grams)!

Consider adding black beans to the menu (1 cup of cooked beans has a whopping 15 grams!)

- Fiber is not just helpful for regulating your digestion – it also helps lower cholesterol and blood sugar! Additionally, fiber is a great weight-loss/maintenance aid as high fiber foods typically are lower in calories, fill you up more than low fiber foods, and stay in your system longer. Other sources that you might like include hummus (try dipping raw veggies or whole wheat pita...you can also use in sandwiches) or oatmeal (be sure to choose a low-sugar option). Be sure to eat these foods in moderation!
- Increasing whole fruits, veggies, and fiber may help to naturally decrease your and CHILD's intake of other foods that fall in the grains and meat/beans categories (which can contribute to weight gain if consumed in large quantities). Consider adding more vegetables to sandwiches instead of extra meat or cheese. Getting kids to eat veggies can be challenging, we know! Be sure to get them in however you can (for you both). Also, be sure to not make too many modifications (i.e., broccoli is great, but we don't want to add a ton of calories by adding cheese!)
- Fruits and veggies can be consumed as snacks throughout the day. Consider...
 - Adding sugar-free applesauce cups in the home and as lunch snacks.
 - Have kid-friendly servings available in the home. If they are easily available and ready-to-go, research shows that kids are more likely to eat them! Adults are too!
 - Ordering apple slices instead of fries at fast food restaurants (or ordering one bag of apple slices and one small fry to share).
 - Adding fresh or frozen (thawed) fruit to low-fat yogurt or cereal.
 - To boost your vegetable intake, consider adding raw or steamed vegetables to your lunch. You could even microwave a potato or heat up frozen veggies.
 - *Set a good example by consuming vegetables yourself, and consider letting CHILD choose the veggie to be served.*
 - Making it fun (for example, strawberry mice!)
<http://familyfun.go.com/recipes/strawberry-mice-687541/>
- Continue to choose water the primary beverage for yourself. Consider encouraging your family to do the same ☺ Adding Crystal Light is a great way to add flavor without calories. Juices, although good for, should be consumed in moderation as they are naturally high in sugar.
- Consider not adding mayonnaise or other sauces or dressings to sandwiches. Increase veggies and reduce the amount of full-fat cheeses – these add a lot of hidden calories and fat grams that can make otherwise healthy options much less healthful.



DID YOU KNOW?

If you can't purchase fresh fruits or veggies for any reason, it is perfectly acceptable to check out the frozen selection at your local grocery store!

A healthy meal plan emphasizes fruits, vegetables, whole grains, fat-free or low-fat dairy products, lean meats, poultry, fish, beans, eggs, and nuts!

Most prepackaged foods are not single servings, so a 300 calorie bag of chips may actually be 600! Be sure to read nutrition labels carefully to determine the serving size!

Cutting calories does not necessarily mean eating less!

"Wheat" is not the same as "whole wheat"!

FAMILY FACTORS

Parenting Style – Based on your answers to several questions, MOTHER, we determined that you are an *authoritative* parent. Authoritative parents encourage autonomy and independence while warmly maintaining appropriate and consistent parent-child boundaries. This is a great parenting style that is associated with many positive child outcomes!

Family Meals – MOTHER, you indicated that your family eats together every night...which is absolutely wonderful! Having regular family meals is considered to be a protective factor for children against a number of unhealthy behaviors. Children who regularly eat with their parents also are more likely to eat healthier foods when they served. Eating at home is definitely ideal as foods that are served at restaurants (even casual dining) may be much higher in calories and fat than the food we prepare ourselves at home.

Eating out – MOTHER, you eat out five times per week and CHILD eats out three times per week. For you and CHILD alone, we estimate that you spend approximately \$2140.84 per year. Are there other things you could use that money for? Weekly family fun nights of miniature golf or bowling? A new computer? A weekend getaway?

CHILD's Usual Meal	Healthier (and tasty!) Alternative
McDonald's Chicken Selects, Fries, and Soda	McDonald's 6 piece chicken nuggets, apple dippers, and juice
990 calories 43 g fat 6 g saturated fat 1290 mg sodium	410 calories 17 g fat 3 g saturated fat 620 mg sodium
Very high in calories, fat, and sodium! Try to limit this meal to once per week.	Still tasty but with 580 fewer calories, 26 fewer fat grams, and 670 mg fewer of sodium!

DID YOU KNOW?

Those children who regularly eat dinner with their family are less likely to be overweight, use drugs, develop depression, or engage in disordered eating practices.

Parents who use healthy foods as rewards for unhealthy foods are actually more likely to promote unhealthy food consumption! In other words, making an unhealthy food contingent on a healthy food only makes it that more appealing and kids are more likely to “overindulge” once the unhealthy food is available.

Close to half of parents with a child who is overweight do not realize their child’s weight is out of the healthy range.

Changes in a child’s physical activity or eating behaviors alone do not work generally. Effective change occurs when all members in the family adopt more healthful lifestyles.

READINESS TO CHANGE

When people think of making changes, they can generally be categorized into one of five stages (precontemplative, contemplative, preparation, action, or maintenance).

Based on your results, MOTHER, you are in the MAINTENANCE stage when it comes to physical activity for you and CHILD. You have been active at recommended levels for more than 6 months. With regard to fruit and vegetable intake, you are in the MAINTENANCE stage for you and CHILD. You have eaten recommended amounts for 6 months or more.

YOUR goal: “Be more active in sports.” What a great goal! Here are some tips that you can consider experimenting with:

- Sports are a great way to be active as a family. What types of things do you think you might like to do? For families, bike riding, playing ball (football, soccer, baseball), swimming, and even playing tag are great activities!
- Schedule, schedule, schedule! We rarely miss work or allow our kids to skip school, but physical activity and family fun time often take a back burner to a number of other things (especially around holidays & big work/school deadlines). Pick a time that works with your existing schedule or make room in your schedule, if necessary.
- If one family member can’t make it, go without them! This is the time you have set aside to be active, take care of yourself, and have fun ☺
- If you find that time gets in your way (or CHILD’s), evaluate what you can “let go of” – there is always something!
- Continue to make active lifestyle choices like taking the stairs and parking farther from entrances. When possible, choose to walk or bike. Consider swimming (which allows you to burn nearly twice the calories in half the time!).

- Identify a variety of activities that you both enjoy – this will help to prevent boredom (which can lead to decreased activity). Consider using a pedometer (you can get one for free from <http://aom3.americaonthemove.org/get-active/activity-choices.aspx>). This website is also great to track “virtual walks” and get other ideas to prevent boredom!
- Have fun – even dancing in your home gets the heart pumping and counts as activity! As long as you are active for at least 10 minutes, it counts! This is a great activity on the rainy, very hot, or very cold (Wii Fit and Wii Sports are also nice indoor options).

General Tips

- Be sure to set a reasonable and measurable goal for yourself and your family. Even three days per week (for nutrition or exercise) may be too frequent at first. Set yourself up for success and readjust the goals as necessary (e.g., increase after you have been successful for a certain amount of time). Always be sure to be specific with your goals so you can assess your progress and adherence.
- Reward yourselves for maintaining lifestyle changes each week (or even small rewards everyday!). Do NOT reward with food, however. Choose things like a relaxing bath for yourself and let CHILD choose something comparable for himself!
- Don't give up – it is natural for people to miss a day here or there. However, it is important for you to think about what indicates a lapse vs. relapse. How will you know if you are no longer meeting this goal? How will you get back on track? Take some time to write this down.

These are just a few of the many options with which you can begin to experiment. What are your thoughts about trying these strategies? It might be helpful to create a list of additional strategies to overcome barriers that can get in your way. When do you think you can make that list?

DID YOU KNOW?

That even small changes can add up to big effects!

Individuals who make lifelong lifestyle changes (as opposed to going on and off of diets) are most likely to lose and maintain weight losses.

Families who identify and plan for challenges are more successful with maintaining healthy weights.

It is never too late to make changes or to get back “on-track.” Lapses are a part of life – even Champion Ice Skaters fall on the ice, but they always get back up! The difference between a lapse and relapse is really determined by how you interpret it.

What to do with all that information...

We know we just provided you with a lot of information. It might help to review it again later today or tomorrow with someone in your family. If you feel ready, identify one or two suggestions that you would like to try. Take a moment to write them down or highlight them on the page. Start today or pick a start date within the next week.

Remember, healthy living is about being more active and enjoying life to the fullest! Things are not going to change overnight. The tips we provided are really about life changes – you have lived your life a certain way up until now, so it is naturally going to take time to change. The idea is to take care of yourself, take care of you children, and teach them how to eventually take care of themselves. Keep your focus on behaviors you can change.

Anticipate challenges and remind yourself of the difference between a lapse and relapse. Take a few moments to write down challenges and ways that you overcame them in the past. Come up with some alternatives for the future. The more you have in your toolbox, the better.

APPENDIX O: INFORMED CONSENT

Informed Consent Form

Dear Parent/Guardian:

My name is Sharon Hayes and I am a doctoral student at the University of Central Florida. I work under the supervision of Dr. Stacey Tantleff Dunn conducting research focused on family health including eating behavior and exercise. I am writing to invite you to be in a research study that investigates the effects of a program developed to provide parents with personalized feedback regarding their family's eating behavior, activity level, and other health-related behaviors. The results of the study may help researchers, parents, physicians, and educators better understand the factors that help families adopt healthy lifestyle behaviors associated with decreased risk for the development of obesity. This study will be conducted completely online. We ask that you read this document and ask any questions you may have before agreeing to be in the study. If you choose to participate, please know that you may withdraw your consent for participation at any time without penalty.

To participate, eligible parents will have a son or daughter between the ages of 6- and 11-years old. Only one parent from each family is eligible to participate. The participating parent should reside with the child full-time (i.e., the majority of the child's days should be spent at the home of the participating parent). Parents may participate regardless of their and their child's current weight. Parents will be asked to participate today and again in approximately 6 weeks.

What you will be asked to do in the study: If you choose to participate, you will answer questions about you and your child's eating behavior, activity level, and weight. Additionally,

you will provide information about your parenting practices and perceptions of your mealtime family interactions. You will receive feedback regarding your responses, information about healthy lifestyle behaviors, and relevant suggestions. Some parents will receive this report within two weeks of their participation and others will receive it within 90 days of their participation. If you receive your report within two weeks, you will be asked to review it completely and respond to an e-mail indicating that you received it and reviewed it. You also will be asked to provide additional information within approximately 6 weeks after your initial participation regardless of when you receive your feedback report.

Time required: Participation will take approximately 45-60 minutes today and 30 minutes approximately 4-6 weeks from now.

Location: You will participate exclusively online.

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. Just tell the researcher or a member of the research team that you want to stop. You will be told if any new information is learned which may affect your willingness to continue taking part in this study.

Risks & Confidentiality: 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. You will be asked to provide personal information. You do not have to answer any questions that make you feel uncomfortable. Any information that you provide will be held in strict confidence to the extent allowable by law, and utilized only for the purpose of this study. Although you will provide your name and your child's names, both of your identities will be kept confidential to the extent provided by law. You also will be asked to provide us with contact information so that we may provide you with feedback, send you the link for the study in approximately 4-6 weeks, and reminder correspondence for the second part of the study (reminder e-mails, letters, and phone calls). To help ensure confidentiality, you will create a code that will be used to connect your contact information and survey information. All of your responses will be stored using your code number. Your name will only be used in your personal feedback report and study correspondence (i.e., e-mails, letters, and calls made directly to you by the researchers). All results will only be reported in the form of group data. All published information will NOT contain any identifying information or individual results. Only people directly involved in the study will have access to this information. Your participation is strictly voluntary, and you may discontinue participation at any time without penalty. You have the opportunity to ask, and to have answered, any questions you may have about this research at any point during the study.

Benefits: There are no known immediate benefits associated with participation. Although study participation may not directly benefit you today, there is the possibility that information received as a result of participation may benefit you and your family in the future.

Compensation: You will receive free personalized feedback about your family. This feedback will include information about eating behavior, activity level, and parenting. It also will include personalized recommendations that might be helpful in promoting healthy lifestyle behaviors. You will receive your feedback report within 90 days of participating. Feedback and suggestions are not intended to replace consultation with a physician. This feedback may not directly help you or your child today, but may prove to be beneficial in the future.

Additionally, you will be eligible to earn a total of \$20 in gift cards (i.e., Target or Wal-Mart) for completing the study – \$10 for participating today and \$10 for participating again in approximately 6 weeks (which will conclude your study participation). You will receive a confirmation email after your gift card is mailed.

Study contact for questions about the study or to report a problem: If you have any questions about the current research, please contact Sharon Hayes, M.S., (shayes@knights.ucf.edu; 407-823-3578) or Stacey Dunn, Ph.D. (sdunn@mail.ucf.edu; 407-823-3578). If you have an interest in learning more about healthy lifestyle behaviors but do not wish to participate in the current study, you may visit www.mypyramid.gov, a website hosted by the U.S. Department of Agriculture. Additionally, if you wish to seek services for nutrition or weight loss/gain, you should consult with your primary care physician or your child's pediatrician.

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.

By clicking yes, you assert that you understand the research described above and voluntarily provide your consent to participate. If you do not wish to participate, please click no and exit the study website.

APPENDIX P: CONSUMER SATISFACTION SURVEY (INTERVENTION)

1. Did you read your feedback report?

- Yes
- No

When did you read your feedback report? (for example, "as soon as I received it" or "just a few

days ago")



2. Did you read the "commonly asked questions" handout that was sent to you?

- Yes
- No

3. If you made changes since you last participated, how influential was the feedback you received? (If you have not made changes, how influential do you believe it will be?)

- Not at all influential.
- I am not sure how much it influenced me.
- Somewhat influential, I probably would have made the changes anyway but it helped.
- Very influential.

Comments:



4. How helpful did you find the feedback?

- Not at all helpful
- Somewhat unhelpful
- Somewhat helpful
- Very helpful

Comments:



5. If the program influenced or affected you and/or your family, please tell us how. For example, did this program affect the timing of when you changed, how you changed, or what you changed? Thank you for providing this feedback.

A rectangular text input field with a light gray background and a thin border. It contains no text. On the right side, there are two small square buttons with upward and downward arrows. On the bottom left and right sides, there are small square buttons with left and right arrows.

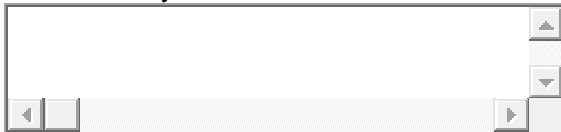
6. How relevant did you feel the feedback was to your family?

- Not at all relevant to my family
- Not entirely relevant or irrelevant to my family
- Somewhat relevant to my family
- Very relevant to my family

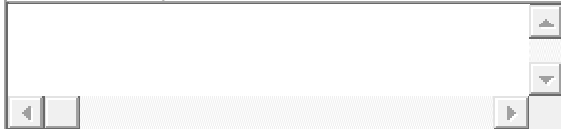
7. Will you read your feedback or refer back to it again in the future?

- Yes
- No


8. What did you like most about the feedback program?

A rectangular text input field with a light gray background and a thin border. It contains no text. On the right side, there are two small square buttons with upward and downward arrows. On the bottom left and right sides, there are small square buttons with left and right arrows.

9. What did you like least about the feedback program?

A rectangular text input field with a light gray background and a thin border. It contains no text. On the right side, there are two small square buttons with upward and downward arrows. On the bottom left and right sides, there are small square buttons with left and right arrows.

10. What do you think we could do to improve this program?

A rectangular text input field with a light gray background and a thin border. It contains no text. On the right side, there are two small square buttons with upward and downward arrows. On the bottom left and right sides, there are small square buttons with left and right arrows.

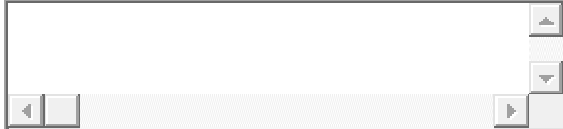
11. If this feedback program became widely available for parents on the Internet, would you recommend it to any of your friends, co-workers, acquaintances (e.g., parents at your child's school), etc.?

- Yes
- No

Why or why not?



12. Other comments



Thank you! We really appreciate your feedback! Part II is now complete. You will view the debriefing form for this study on the next page.

APPENDIX Q: CONSUMER SATISFACTION SURVEY (CONTROL)

1. We are interested in your perceptions of the study. Please let us know anything that you think would be helpful for us to know.



2. If you made changes for yourself or your family, how much did this study influence you?

- I did not make changes
- Not at all
- I am not sure
- Somewhat (I probably would have made them anyway)
- Very influential

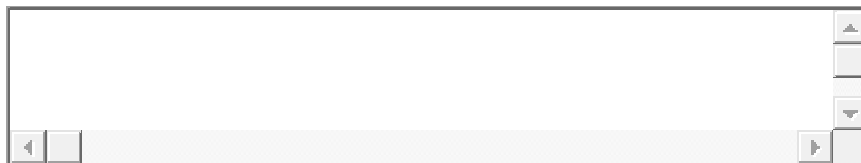
If it influenced you at all, please tell us how (e.g., timing, type of change).



3. Would you recommend this study to other parents?

- Yes
- No

Why or why not?



4. Is there anything else about your experience that you would like to share or think would be helpful for us to know? Please share your thoughts here.

A rectangular text input field with a light gray border. On the right side, there are two small square buttons with upward and downward arrows. Below the input field, there is a horizontal scroll bar with a small square slider and arrowheads at both ends.

APPENDIX R: DEBRIEFING FORM

Effects of an Online Family-Based Intervention to Promote the Adoption of Healthy Lifestyle

Behaviors Associated with a Decreased Risk for Obesity

Research conducted by Sharon Hayes, M.S. and Stacey Tantleff Dunn, Ph.D.

Thank you for your participation in this research project. Participation by parents like you is critical for the research and results to be relevant. The purpose of this study is to determine if the delivery of personalized feedback is effective in promoting behavior change associated with decreased risk for obesity.

Recent research has revealed that one-third of children 6 years old and older are classified as overweight or obese (Ogden et al., 2008). The American way of life is, in many ways, incongruent with the promotion of activity and healthy eating. The current application has the potential to reach many families quickly and economically – many of whom might not even realize their child is overweight (e.g., Chaimovitz et al., 2008).

As a reminder, your participation was *completely confidential*. If you experience discomfort or negative feelings after your participation in the study, you may call Dr. Stacey Dunn at the University of Central Florida.

We sincerely appreciate your participation!

Stacey Tantleff Dunn, Ph.D. (407-823-3578; sdunn@mail.ucf.edu)

Sharon Hayes, M.S. (407-823-3578; shayes@knights.ucf.edu)

Bob Dipboye, Ph.D., Department Chair (407-823-2216; rdipboye@mail.ucf.edu)

If you are interested in learning more about obesity, weight related medical complications, or healthy lifestyle suggestions, you may visit:

www.mypyramid.gov

www.obesity.org

www.cdc.gov/healthyyouth/obesity

www.americanheart.org

www.diabetes.org

APPENDIX S: EXPLORATORY ANALYSES CONSIDERATIONS

Regression Analyses

A series of stepwise multiple regression analyses was conducted to investigate the relationships among follow-up dependent variables and baseline independent variables. The stepwise method was chosen given the exploratory nature of the analyses. Condition was not entered into the analyses due to the nonsignificant results of the proposed hypotheses. Independent variables included baseline BMI, physical activity, screen time, self-efficacy, stage of change, AYCE subscales (mealtime interactions), CFQ subscales (parent feeding practices), PSDQ subscales (parenting style), and frequency of fast food/casual dining. Listwise deletion was chosen to maintain consistency throughout the analyses.

Results of stepwise regression analyses highlighted the importance of some parent behaviors in health-related child behavior outcomes. However, baseline child behaviors were most commonly retained as predictors of follow-up child behaviors. Given the predictive ability of baseline behaviors, these findings reinforce the importance of helping children to adopt healthy lifestyle behaviors at a young age. However, it is important to interpret these findings in the context of the very brief follow-up period and limitations of the data (e.g., restricted parenting style data). Additional follow-up periods will help to better identify the variables that may be most salient in treatment outcome.

Child Screen Time

Child screen time ($F(2,63)=10.60, p<.0001$), child physical activity time ($F(3,63)=11.33, p<.0001$), parent physical activity time ($F(4, 63)=10.36, p<.0001$), and baseline parent BMI ($F(1,63)=4.55, p=.04$), were retained and accounted for a collective 31% of the observed variance in follow-up child screen time.

Child Total Physical Activity Time

Baseline parent stage of change for child physical activity ($F(1,63)=4.09, p=.03$) and child physical activity time ($F(2,63)=132.88, p<.0001$) were retained and accounted for 70% of the observed variance in children's total activity time.

Child Fast Food/Casual Dining

Baseline child resistance to eating ($F(1, 62)=22.46, p<.0001$), total child activity time ($F(2,62)=15.45, p<.0001$), and child fast food/casual dining ($F(3,62)=16.59, p<.0001$) were retained and accounted for 43% of the variance in follow-up child fast food/casual dining visits per week.

Total Child Dietary Changes

Baseline parent BMI ($F(1,60)=4.10, p=.05$), total child screen time ($F(2,60)=6.41, p=.003$), parent stage of change for child physical activity ($F(3,60)=9.81, p<.0001$), and scores on the connection dimension of the PSDQ ($F(4,60)=9.90, p<.0001$) were retained as significant predictors of total number of dietary changes accounting for 37.2% of the variance.

Other Exploratory Considerations

BMI

Although no change was anticipated, exploratory analyses were conducted to examine any changes over time or between groups at follow-up. Results failed to reveal any changes for adults or children. Baseline BMI also was added to the mixed models. Results failed to reveal any main effects of BMI category or interactions involving BMI for parents or children. It is important to note that these analyses were not adequately powered (cell sizes were quite small). For example, control and intervention cell sizes for overweight/obese children were 11 and 13,

respectively. Additionally, 2 x 2 (time x condition) mixed model ANOVAs were run exclusively with overweight and obese participants. To maximize power, overweight or obese parents and children were combined. Results failed to reveal any interaction of time x condition for any parental outcome variable. However, a trend toward significance was observed for physical activity self-efficacy for parents, $F(1, 44) = 3.63, p = .06, \eta^2 = .076$. This trend suggests that overweight/obese parents and/or parents of overweight/obese children in the intervention condition were more likely to report greater confidence in their own ability to ensure that they obtain recommended amounts of physical activity from baseline ($M = 15.71, SD = 6.34$) to follow-up ($M = 17.43, SD = 5.71$) compared with control parents who observed a mean decrease over time (baseline: $M = 16.68, SD = 5.48$; follow-up: $M = 16.04, SD = 5.43$). This trend was not observed for the entire sample; therefore, it is possible that the receipt of motivationally-tailored feedback has some benefits in terms of promoting self-confidence regarding physical activity for overweight/obese parents. Future studies should investigate this trend further with a larger sample.

For children, there was a trend toward significance for the time x condition interaction for child video game play, $F(1, 50) = 3.44, p = .07, \eta^2 = .064$, (Intervention: baseline: $M = 4.63, SD = 5.83$; follow-up: $M = 2.94, SD = 3.37$; Control: $M = 3.16, SD = 4.72$; follow-up: $M = 4.88, SD = 8.01$). For overweight/obese children, reducing screen time may be an important change that assists them in becoming more active. This trend indicates that motivationally-tailored feedback may help parents to ensure that their child engages in activities other than video game play. All other analyses failed to reveal any interaction of time x condition on outcomes for children for who were overweight/obese or had an overweight/obese parent.

Future studies should focus on recruiting an adequately powered overweight/obese sample to better test the effects of BMI on an online, motivationally-tailored, family-based intervention.

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