PARENTING STYLE AND OLDER CHILDREN'S AND YOUNG ADOLESCENTS' DIETARY INTAKE AND NUTRITIONAL STATUS

A Dissertation

by

MI JEONG KIM

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2006

Major Subject: Nutrition

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Approved by:

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ABSTRACT

Parenting Style and Older Children's and Young Adolescents' Dietary Intake and Nutritional Status. (May 2006)

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Chair of Advisory Committee: Dr. Wm. Alex McIntosh

While parenting style and its relevant dimensions have long been studied in the area of child development, studies on the effects of perceived parenting behaviors on children's/adolescents' nutritional health status have been largely neglected. The present study examined whether perceived parenting style and its dimensions are associated with older children's/young adolescents' health outcomes, including self-concept, eating behaviors, physical activity behaviors, energy and nutrient intake, and body measurements. This study placed a distinct emphasis on gender differences by exploring the effects of maternal and paternal parenting behaviors on male versus female subjects' health outcomes in separate analyses. In addition, this study extended the investigation of the roles family meal behaviors play in an environment in which general parenting behaviors exert their impact on children's/adolescents' health. Sources of insight from nutrition, psychology, and sociology contributed to this holistic examination of children's/adolescents' health.

The study subjects included 123 children (9-11 years old) and 106 adolescents (13-15 years old). Data were obtained through survey questionnaires, dietary recall and records, and anthropometry. Various statistical methods were employed in this study, including multiple regression analysis, cluster analysis, factor analysis, and path analysis. Findings of this study confirmed that an authoritative style is more desirable for study subjects' health outcomes, compared with a non-authoritative style. Generally, maternal/paternal nurturing appeared to be desirable, but maternal/paternal control was an undesirable predictor of youth health, while the subjects' age (9-11 versus 13-15 years) and gender played critical roles in the associations. Family meal behaviors appeared to be significant predictors of youth health outcomes. Findings from path analysis suggested that the effects of maternal/paternal nurturing/control on the subjects' health outcomes are mediated by family meal behaviors. Perception that family dinner meals are family rituals turned out to be the most important mediator of the relationship between maternal/paternal nurturing and the subjects' health outcomes. Of interest, lack of food pressure by parents appeared to be detrimental to eating behaviors and essential nutrient intake of study subjects. Finally, this study showed that fathers play positive roles in improving male/female subjects' as well as children's/adolescents' health outcomes, especially their physical activity behaviors and self-concept.

DEDICATION

This chapter of my life is dedicated to Kwang Hyo, my husband, and Ho Joon, my son

for their endless support, love, and devotion,

and also to my parents and in-laws for their advice, support, and prayers.

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When I ponder my past several years, I am filled with mixed feelings. As a student-mom, I had to learn how to cope with life stresses while continuing my study. Son, thank you for letting me see myself though the mirror of you. You strengthened your mom mentally and physically through the course of your growing. Without you, I would not have realized the value of learning and the true meaning of family. Someday, when I revisit this chapter of my life with you, we will remember the wonderful smiles and pure heart of a young boy.

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Although I cannot name all the people who have helped me on this page, I am deeply grateful to them for their support and concern for me.

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CHAPTER I

INTRODUCTION

Current eating and physical activity habits of American adults and children have led to an increased incidence of overweight and other health complications. The estimated prevalence of obesity (BMI greater than or equal to 30.0) among American adults doubled between NHANES II (1978-1980) and NHANES 1999-2002, from approximately 15 percent to an estimated 30.4 percent (1). An estimated 65.1 percent of American adults have classified as overweight or obese between 1999 and 2002 (1). The incidence of childhood/adolescence overweight has increased at an alarming rate and the figures of estimated youth overweight population showed a dramatic increase: about 15.8 percent of children (ages 6 -11) and 16.1 percent of adolescents (ages 12-19) fell in the category of extremely overweight or obese (95^{th} percentile of BMI-for-age) in 1999-2002, whereas only 7 percent of children and 5 percent of adolescents were obese in 1976-1980, suggesting childhood and adolescence overweight has doubled and tripled in two decades, respectively (1). Evidence is compelling that being obese or overweight has a connection with a variety of health problems. Adult obesity has been often associated with several health problems, including type II diabetes, hypertension, coronary heart disease, and high morbidity and mortality. The seriousness of obesity is indicated by the 300,000 US adults' death per year was attributable to obesity-related causes (2). Childhood/adolescence overweight is considered to be more serious, given

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that overweight children and adolescents often become obese adults. Furthermore, many adult-associated diseases, including type II diabetes, dyslipidemia, hypertension, cardiovascular disease, osteoarthritis, and sleep apnea, are now diagnosed frequently among overweight children and adolescents (3-6). In addition to the connections to chronic diseases, but overweight children and adolescents are facing challenges of social stigmatization that can lead to negative body image and eating disorders, and abnormal psychological developments (7-9).

A considerable amount of attention has been paid in an attempt to elucidate the increasingly serious weight-related problems in the U.S. youth population from various perspectives including economic, social, psychological, genetic, and environmental. Researchers have suggested that certain dietary behaviors, as well as environmental factors, affect a child's development and contribute to an increase in weight and risk of becoming overweight (10). Certain dietary patterns of US children and adolescents are attributable to the increased frequency of youth weight-related problems. Dietary behaviors receiving a lot of attention include increased consumption of snack and convenience foods, which tend to be high in fat, sugar, and sodium, eating away from home, irregular meals, skipping meals, and imbalance between energy intake and expenditure (11), and bulimia nervosa, binge eating, compulsive eating, and dieting (12). Environmental factors being researched include family, school, community, and mass media. These social environments may affect children and adolescent's perceived body image as well as body self-esteem, which in turn affect the propensity of body dissatisfaction, eating disorder, and extreme weight outcomes (13).

Of these listed environmental factors, researchers consider the family, especially parents, to be the most influential component affecting a child's eating behaviors, food preferences, food aversions, and other related food practices (14). However, parents vary in terms of the ways in which they socialize their children (referred to as parenting style), resulting in great differences in children's development (15). For this reason, it is important to pay particular attention to parenting styles in relation to child and adolescent eating behaviors and the risk of being overweight. Recently, there has been growing efforts to speculate the potential impacts of family meals that have on children and adolescents' nutritional outcomes such as eating behaviors and weight status. Interactions between family members can take place during family meals. For example, parents can provide companionship and establish positive atmosphere, and model appropriate food-related behaviors, all of which can influence the children to develop certain attitudes toward family meals and eating behaviors. A study showed that children and adolescents who ate dinner with family more frequently consumed substantially higher amount of fiber, calcium, folate, iron, vitamins B_6, B_{12}, C, and E, and lower amount of saturated and trans fats as a percentage of energy (16). Taken together the impacts of parents and the role of family meals on children and adolescents' dietary behaviors and nutritional outcomes, it may be insightful to examine the seemingly-complex relationships among parenting behaviors, family meals, and child's overall health outcomes.

CHAPTER II

LITERATURE REVIEW

1. Prevalence and Health Consequences of Overweight during Childhood and Adolescence

According to CDC (17), overweight is defined as body mass index (BMI) at or above the 95th percentile of the 2000 CDC BMI-for –age growth charts. A recently released national health data National Health and Nutrition Examination Survey conducted by CDC and NCHS (National Centers for Health Statistics) indicated that the proportion of children ages 6-18 who were overweight increased from 6.1% in 1976-1980 to 15.8% in 1999-2002. Moreover, the prevalence of overweight population among youth appeared to continuously increase over two and a half decades: from 6.1% to 11.3% to 15.8%. Also, the estimates indicated smaller percentage of White-alone, non-Hispanic children (13.2%) were overweight, compared with Black-alone, non-Hispanic (20.7%), and Mexican American children (23.1%). More specifically, 16.9% of male children (ages 6-11) and 17.5% of adolescent (ages 12-18) males were overweight in 1999-2002, whereas 14.7% of female children and 14.8% adolescent females were classified to be overweight in the same period. Mexican American males were at particularly high risk of being overweight for both children (26.5%) and adolescents (27.3%). For females, Black-alone, non-Hispanic children (22.8%) were overweight and both Black-alone, non-Hispanic (23.7%) and Mexican American (21.5%) adolescents were more likely to be overweight than White-alone, non-Hispanic adolescents (11.1%). In summary, the national estimates showed that not only the overweight youth population has increased, but also ethnic disparities existed (18). Increased overweight prevalence among children over two decades was also found when multiple indicators of body fatness were used. Dwyer et al. (19) reported that overweight prevalence in Child and Adolescent Trial for Cardiovascular Health study (CATCH) in 1991 and 1994 was higher in boys than in girls at both measurements of age 9 and 11, and higher among African-Americans and Hispanics than whites for both sexes. The comparison of findings from CATCH with other studies showed that children in CATCH were markedly heavier and fatter than the population in NHANES I (1971-74), and more comparable to the NHANES III population (1988-94).

With the secular trend in body weight status in population subgroups, researchers have devoted a great deal of attention to seeking the underlying causes of the overweight epidemic in children (obesity in adults). A study showed the potential influence of genetics on the prevalence of overweight by showing both overweight and non-overweight children were at greater risk for obesity as adults if at least one parent was obese, at every age interval (20). However, genetics alone does not singly determine if a child will become overweight because overweight in children and obesity in adults are multifaceted health problems. Not only individual factors such as imbalance between calorie input and output, but also social, economic, and environmental factors may contribute to the increasing prevalence of overweight.

The immediate consequences of overweight in childhood are often psychosocial but also include cardiovascular risk factors such as high blood pressure, high cholesterol, and precursors to diabetes (21). Being overweight is even more worrisome because overweight adolescents often become overweight adults if they do not return to normal weight (22). Studies have shown that being overweight had strong associations not only with a wide variety of poor health outcomes, including diabetes, hypertension, coronary heart disease, arthritis, and certain cancers, but also with increased morbidity and mortality (23).

2. Older Children and Their Health

2.1. Developmental Characteristics

Compared with infancy or adolescence, school-aged children's growth is steady; however, during older childhood, there is an increase in percent body fat in preparation for the growth spurt, especially among female children. Thus, school-aged girls may develop more body-related concerns than boys (24). For school-aged children, proper nutrition plays an important role in allowing children to reach their full growth, development and health potential. Therefore, adequate nutrition and development of healthy eating behaviors are important because they can help promote good health and reduce the risk of health problems later in life (25).

2.2. Self-Concept

According to Harter's definition, self-concept is an individual's perception of the combination of different aspects of the self and thus it is viewed as a multidimensional construct. Individuals may have differing perceptions of their competence in various areas of functioning, but have an overall view of their self-worth that is more than the mere sum of these areas (26). Development of self-concept is continued during the move from childhood to adolescence. According to Bardwick (27), both boys and girls' self-esteem derives largely from the mastery of age appropriate skills until prepuberty. Girls, however, shift their source of self-esteem from achievement to heterosexual affiliation, beginning in pre-puberty and increasing through adolescence, and have lower self-esteem than boys. In a study using 7-13 year old children, boys had higher self-esteem than girls, but the sex difference in self-esteem did not reach until the onset of adolescence (sixth grade). The reason for gender difference in self-esteem scores was not because girls' self-esteem dropped significantly, but because boys' self-esteem rose, while girls' self-esteem remained stable between the ages 7.5 and 13. The relationship between reading score and self-esteem held for boys at each grade level, but not for any of the girls' groups (28). Another study showed a significant positive correlation between parental support and high ratings of perceived competence among middle school children whose parents had substantially differing parenting style (29). A study measured third graders' overweight concern and body dissatisfaction. The findings include 26% of boys and 35% of girls reported wanting to lose weight, and 17% of boys and 24% of girls reported dieting to lose weight. Also, being Latinas or African American were important predictors for higher level of weight concern and body dissatisfaction. Higher SES was positively associated with African American girls' weight concern, but negatively associated with white girls' weight concern (30). Children and adolescents are exposed to conflicting messages regarding food and weight issues from family members and from society because the familial and societal environments idealize thinness and stigmatize fatness while the food-related environments allow a quick access to excess food intake (31). Levine et al. reported two strong correlates of drive for thinness and disturbed eating patterns among 10 to 14 year old girls: reading magazines that deal with attractive body shape and weight managements; weight/shape related teasing and criticism by family. The researchers contended that adolescent girls are at risk of eating disorders because the young females live in a subculture of intense weight and body-shape concern (32).

2.3. Eating Behaviors and Energy and Nutrient Intake

Researchers have shown that the more soft drinks children consume, the less milk they drink, the more overweight the children are, the higher percentage of calories from soft drinks they consume, and the lower children's average number of food group servings that are below the Food Guide Pyramid recommendation (33). One significant trend in eating among school-aged children is increased snacking. According to a recent study, about one third of 11 year-old children were classified as 'unhealthy snackers' based on the definition of 5 or more consumption occasions of sweets or chocolate, biscuits or cake, crisps, and fizzy drinks per day. Also, being male was one important predictor for the likelihood of being unhealthy snackers (34). According to an analysis done by Bowman et al. (35) using the U.S. Continuing Survey of Food Intake by Individuals Survey conducted between 1994 and 1998, 30.3% of children ate fast-food on a typical day. More importantly, fast-food consumption was associated positively with children's total energy, fat, energy per gram, carbohydrate, added sugars, and sweetened beverages, and associated negatively with the consumption of fiber, milk, and non-starch vegetable. Along with the undesirable eating habits such as increase of added sugar intake, declining physical activity and increased sedentary lifestyle may have an important role in the increased incidence of being overweight (36). According to 24-hour dietary recall data drawn from the Child and Adolescent Trial for Cardiovascular Health study in a longitudinal setting, nutrients intakes did not meet recommended levels for total fat, saturated fat, and sodium among male and female third and eighth graders. Female children's calcium and iron intake consistently fell short of recommended levels. In particular, females' intake of energy from total fat, calcium, iron, folic acid, vitamin A and vitamin D decreased over time relative to males' intakes, controlling for overall energy intake (37). A nationally representative sample of children aged 6-11 was studied to examine the relationships between choices of food and beverages high in added sugars and intakes of key nutrients and food groups (38). The results indicated that the consumption of sweetened dairy products was positively associated with calcium intake. Consumption of presweetened cereals increased the likelihood of the children meeting recommendations for calcium, folate, and iron, whereas the consumption of sugar-sweetened beverages, sugars, sweets, and sweetened grains decreased the likelihood of meeting the nutrients' DRI. Only children who were non-consumers of sugar-sweetened beverages had a mean calcium intake that met the adequate intake (AI). Overall, the study suggested that sweetened dairy foods and beverages and presweetened cereals had a positive impact on children's diet quality, whereas sugar-sweetened beverages, sugars, sweets, and sweetened grains had a negative impact on their diet quality (38). Another study examined relationships among dietary and physical activity behaviors and social and environmental influences among fifth graders and the findings included that girls scored healthier on food preferences and diet self efficacy than did boys, but no difference was found in their diet behavior and that girls participated in more low-intensity physical activity, but boys participated in more high-intensity physical activity (39). In an earlier report regarding the Bogalusa Heart Study, 10 year old children in 1987-1988 were 3 lb heavier than the same age children in 1973-1974, but total energy intakes remained the same between the one and half decade. There was a shift of composition of macronutrients over the periods: an increase in the percentage of energy from protein and carbohydrates and a decrease in the percent energy from total fat, particularly saturated fats. However, more than 75% of children consumed more total fat, saturated fats, and cholesterol than the recommended amounts (40). Similar trends were reported in a very recent review that covered 10 more following years from the Bogalusa Heart Study. In an examination of the trends in food nutrient intake for US children, consumption patterns of aged 6-11 years old children were compared over a two decade period. Mean calorie intakes were 2050 Kcal and 1825 Kcal for boys and girls, respectively. A significant trend was found regarding the proportion of macronutrients that account for total calorie consumption. In 1994-1996 and 1998, boys' carbohydrate consumption was significantly increased and girls' carbohydrate intake was 38g higher per day, whereas calorie intake from fat was lower than in 1977-1978. However, children's fat (33% of total energy) and saturated fat intakes (12% of energy) in 1994-1996, and 1998 were still higher than that recommended by the Dietary Guidelines for Americans (30%, 10% of energy, respectively). The observed decrease in the percentage of calories from fat is more due to the increase in calories from carbohydrates than to the decrease in fat intakes based on the estimates that fat intake decreased by about 100 Kcal or less, but carbohydrate intake increased by about 150 to 200 Kcal. For secular trends in children's mineral and vitamin consumption, intakes of B vitamins such as thiamin, riboflavin, niacin, and vitamin B_6, vitamin C and iron increased for boys, whereas intake of vitamin B_{12} decreased for both boys and girls. Mean dietary fiber intakes were 12 g for girls and 14 g for boys in 1994-1996, 1998, and these figures considerably fell short of the current nutritional goals (25 g and 28 g for 1800 Kcal and 2000 Kcal energy patterns, respectively). Less than one-half of the children met the recommended number of servings for any given Food Pyramid group. There was a great increase in the intakes of soft drinks, discretionary fat and added sugars. Total consumption of fluid milk decreased; this was driven by decreases in whole milk, while lowfat milk and skim milk consumption increased over the 20 year period (41).

2.4. Physical Activity Behaviors

A study done by Crocker et al. measured children's perception of physical conditioning, sports competence, strength, body appearance and general physical self-worth, and examined the relationships between these physical self perceptions and physical activity in children aged 10-14 years. Findings included that boys were more physically active than girls and perceived they had greater sport competence and strength than girls did; significant pathway were found from both physical conditioning and sport skills to physical activity in their structural equation modeling procedures and the pathways found were similar for boys, girls, and for the sample as a whole (42). In a recent family-based behavioral intervention study, parents' adherence to praising child and modeling healthy eating habits significantly predicted decreased prevalence of overweight percentage in a two year experiment among 8-12 year old children (43).

3. Adolescents and Their Health

3.1. Developmental Characteristics

Adolescence is inherently a period of difficulty, and problematic development is more interesting than normative development during this phase of the life cycle. Thus, healthy adolescent development is more about the avoidance of problems than about the growth of competencies. Early adolescence is characterized by an increase in "bickering and squabbling" between parents and teenagers, and adolescents' individuation and autonomy striving (24). Avenevoli and Steinberg indicated that the spike in prevalence rates of depression occurred at early adolescence and continued to increase, although it became less dramatic during adulthood (44). Researchers showed that gender difference in rates of adult depression, with women far more likely than men to suffer from depression, did not emerge until adolescence, and the gender difference in adult depression can be accounted for entirely by gender differences in adolescent-onset depression rather than adult-onset depression (45, 46).

Compared with children, adolescents begin to have greater purchasing power and make a lot more dietary and physical activity choices for themselves. It might be that adolescents' increased purchasing power and autonomy striving, if combined with inadequate food attitude and behaviors, may play a role in the etiology of eating disorder and obesity.

Nutrient needs in adolescence are greater than any other stage of life. With the onset of adolescence, the difference of growth patterns by gender becomes apparent during the growth spurt, especially skeletal system, lean body mass, and fat stores: more body fat in females, and more lean body mass in males (24, 47). Gender difference in the patterns of development may require different nutrition interventions for male and female adolescents, which may result in desirable health outcomes.

3.2. Self-Concept

During the transition from childhood to adolescence, adolescents experience a number of changes including physical, family and social role, high expectation of responsible behaviors and independence, and intellectual development, all of which require new behaviors for the adolescents. Researchers indicated that adolescents who rated self-concepts to be low were associated with poor school achievement, social deviance, and delinquency (48, 49). In a recent cross-sectional study that measured adolescent boys and girls' weight related attitudes and dieting behaviors in conjunction with mother's encouragement of dieting, mother's encouragements for male adolescents to diet was associated with males' binge eating, dieting, and skipping meals after controlling for males' BMI. Mother's own dieting behaviors was associated with female adolescents' weight-related concerns and behaviors before the model was controlled for females' BMI. However, 43% of males and 46% of females who were encouraged by their mothers to diet were classified as non-overweight (50). Several studies indicated gender difference in terms of behavioral strategies for body weight control. Smoking behaviors was chosen as a way of losing weight by some adolescents. A study showed that increased prevalence of smoking among female adolescents who reported trying to lose weight regardless of overweight status, whereas overweight male adolescents who were trying to lose weight were less likely to smoke (51). It appeared that females changed intake of several foods in order to change weight, whereas males changed the intake of desserts. Males tended to do hard exercise, stretching, and toning in order to gain weight, whereas females devoted time to those activities with a purpose of losing weight (52).

With concerns about the rapid increase in the incidence of obesity, researchers have turned their attention to ways parenting dimensions affect children's body self-esteem, body concern, eating behaviors, nutrition, and weight status. Stomer and Tompson (53) showed that the more negative comments parents express, the more likely that children will have dissatisfaction of their bodies. Female adolescents, especially, have a higher level of body concern than males, which may be due to the fact that females are more vulnerable to influence generated by the mass media (53). Other researchers, however, have argued that the cultural impact on children's perceived body image and body concern may function through parental and peer interactions (54). It has been shown that if parents fail to maintain a close relationship with their teenagers or if they model deviant behavior, the child is more likely to drift into deviant peer groups, or become involved in drug use or delinquency (55, 56). Recently, McIntosh et al. (54) examined the effect of relationships between parents and adolescents in relation to adolescent body concerns. Interestingly, male adolescents showed great concern about gaining weight, which seems to be the opposite of the findings of general trends concerning underweight among males (54, 57). Tienboon et al (58) measured perceptions of body images, desired weight, and weight loss behaviors among 14-15 year old adolescents. The results indicated gender difference in perceptions of and attitudes to body weight in that most boys tended to see themselves at normal weight while only girls below the 10^{th} percentile for BMI consistently rated themselves as normal. On average the weight desired by boys and girls in the normal range for BMI was 2.2 and 6.0 kg less than their actual weight, respectively, while their desired height was 12.8 and 8.0 cm greater than their actual height. The bigger the gap between desired and actual body weight was, the more likely adolescents were involved in weight-loss behaviors (58).

3.3. Eating Behaviors and Energy and Nutrient Intake

Story et al. (59) examined conceptual factors that influence on adolescents' eating behaviors and food choices: 1) individual or intrapersonal influences such as food preferences, self-efficacy, biological reasons, and life style, 2) social environmental influences such as family, demographic characteristics, family meals, peers, and food availability, 3) physical environmental influences such as school, fast-food restaurants, vending machines, convenience stores, and work sites, and 4) macrosystem (societal) influences such as media and advertising that target adolescents as consumers (59). A pattern of concern in U.S. adolescents' diets may be characterized as low fruit and vegetable intake, increased snack that tend to be high in fat, sugar, and sodium, soft drink, and fast food consumption, super-sized servings, skipping meals, and increased incidence of eating away from home (60, 61). The Minnesota Adolescent Health Survey showed unsatisfactory intake of fruits and vegetables among adolescents in grades 7 through 12 (62). Other researchers have shown that snacks can make important contributions to the overall nutrient intake of adolescents (63). Adolescents aged 14 to 15 obtained more than 25% energy and more than 20% of the total intake for several nutrients, including calcium, magnesium, and vitamins A, C, and E from snacks. The researchers also reported no significant correlations between variables such as the hours of television viewing and the number of snacks consumed, the hours of television viewing and obesity, television viewing and cardiovascular fitness measured by a modified Harvard Step test, and number of snacks and fitness score (63). Nicklas et al. examined efficiency of breakfast consumption pattern in terms of nutrient-to-cost comparison. For every dollar spent, the Ready-to-Eat (RTE) cereal and other breakfasts provided significantly more energy, carbohydrate, fiber, sugar, and protein than the fast-food breakfast. The RTE cereal breakfast provided significantly more of folic acid, iron, niacin, vitamins A and D, and zinc than the other 2 breakfast, per dollar spent (P<.001) (64). A study drawn from the CATCH tracking trial analyzed 8th graders' micronutrients intake and nutrition awareness between users of vitamin and (or) mineral supplements and nonusers by means of a single 24-hour dietary recall. Users consume in average 1.4 supplements and about half of which were multi- vitamins and minerals. Supplements users consumed higher amount of nutrients from foods and higher total amount of several micronutrients, and they showed higher nutrition awareness compared with nonusers. Siega-Riz et al. studied U.S. adolescents' meal patterns using three days of dietary record of the CSFII 1989-1991 data. Forty-one percent of adolescents consumed "consistent" meal pattern (at least two meals on all three days). Inconsistent meal pattern was defined if adolescents consumed only one meal with or without snacks, or snacks only on all three days. Regression analysis determined three significant predictors of an inconsistent meal pattern: being black (Adjusted Odds Ratio (AOR) =4.19), older (AOR=1.41), and from a single-parent household (AOR=2.60). Adolescents who followed a consistent meal pattern consumed an adequate amount of calories, calcium, iron, vitamin E, and fiber, compared with inconsistent meal pattern eaters. In addition, the study pointed out that the adolescents consumed a diet that is too high in fat, sodium, and protein, and too low in fiber, regardless of meal pattern (65). A recent study on 1994-96 and 1998 USDA CSFII, 12-17 year old adolescents' intake of foods and beverages that contained added sugars and the effects of adder sugar on key nutrients and food groups were examined. The researchers found that a significant decline in calcium intake was associated with increased intake of sugar-sweetened beverages and decreased consumption of sweetened dairy products and pre-sweetened cereals. Only adolescents who were high consumers of presweetened cereals met the DRI for folate. Adolescents met the DRI for iron, however, iron intake consistently fell as the consumption of sugar-sweetened beverages, sugars, and sweets. Saturated fat intake was positively associated with and fiber intake was negatively associated with increased intake of sugar-sweetened beverages and sweetened grains. There was a significant increase in the amount of added sugar as intake of sugar-sweetened beverages, sugars, sweets, and sweetened grains increased (38). According to NHANES 1888-1994 study, beverages contributed 20-24% of energy and soft drinks alone provided 8% of energy in 12-19 year old adolescents (66). A study estimated calcium intake and knowledge on this nutrient among 9th grade adolescents (67). Estimated calcium intake for males and females were 57%, and 45% of RDA, respectively. About 60% of the adolescents knew that adolescence is a critical period for peak bone mass accretion, but only 15% adolescents knew the role of calcium as blood pressure regulation. Also, only one fifth of participants were aware of the RDA of calcium for their age and gender, and more than half of the adolescents did not know about non-dairy sources of calcium (67). According to a recent review on the dietary intake trends among US adolescents aged 12-19 year-old over two decades (1977 to 1996), mean energy intake was 2766 Kcal and 1910 Kcal for adolescent boys and girls, respectively (68). Carbohydrates consumption was increased over time for both boys and girls: boys and girls consumed 87 g and 60 g more carbohydrates in 1994-1996 than in 1977-1978, respectively. As with the findings for children aged 6-11 years, proportion of energy from fat was decreased, but this decrease is more due to increase in calories from carbohydrates than to the decrease in fat intake. Fat intake was increased by almost 100 Kcals for both boys and girls, but carbohydrates intake increased by about 350 Kcal for boys and 240 Kcal for girls. The percentages in caloric intake from total fat and saturated fat (32% and 12% for boys and 33% and 11% for girls) were still higher than what is recommended by the Dietary Guidelines for Americans. Turning to secular trends in adolescents' vitamins, minerals, and intake of other nutrients, iron intake increased for both boys and girls and niacin was significantly increased for girls. Vitamin B_{12} intake was lower for both boys and girls, while the trend was not significant. Adolescents' mean dietary fiber intakes in 1994-1996 (17 g for boys and 13 g for girls) fell short of several recommendations (estimated total fiber recommendation is 14 grams per 1000 Kcal by the Institute of Medicine; 31 g for male 9-13 year old, 38 g for male 14-18 year old, and 26 g for female 9-18 year old). For adolescents' intake of food groups, less than one-half of the adolescents met the recommended number of serving for each food group category based on the Food Guide Pyramid. Also, adolescents consumed much higher amount of discretionary fat and added sugars than recommended. All these results suggested the need for US adolescents to change their current dietary pattern into pattern that includes increases in the consumption of whole grains, fruits, vegetables, legumes, nonfat or low fat dairy products, as well as decreases in fats and added sugars, as indicated in the Dietary Guidelines for Americans (68).

Overall, the dietary patterns of US adolescents found in the literature appeared to show increased energy intake, decreased intake of vitamins, minerals, and other essential phytochemicals, which may, in turn, result in metabolic disorders, and increased incidence of overweight among adolescents. Adolescents' inadequate eating behavior, together with sedentary life style and genetic influences, may provide an explanation for the prevalence of overweight during adolescence.

3.4. Physical Activity Behaviors

About a decade ago, only about half of adolescents ages 12 to 21 reported regular participation in vigorous physical activity and one fourth reported no vigorous activity.

The percentage of high school students who were enrolled in physical education classes and who reported being physically active for at least 20 minutes in physical education classes declined from approximately 81% to 70% during the first half of the 1990s (69). Recently, researchers assessed the amount of physical activity that 8th grade adolescents' engaged in. The results showed that participants engaged in an average of 18.6 minutes of moderate to vigorous physical activity per day. Boys were more active than girls in the afternoon period (3 pm – 7 pm) on every day of the week except Sunday. Boys spent more time watching TV, playing computer games and sports while girls spent more time in personal care. The results suggested that strategies to reduce time spent in personal care, watching TV and playing computer games may result in increased physical activity (70). In a age- and stature-matched pairs study using 11-15 year-olds of normal body weight versus overweight adolescents, decreased physical activity, increased physical inactivity, and a greater perceived ideal body size appeared to be the most important contributory factors to overweight status. The study also reported that there were no statistical differences in macronutrient and micronutrient intakes, self-esteem, eating attitudes, health behavior knowledge, and maturation status between normal weight and overweight adolescents, whereas significantly greater amount of calorie intake per body Kg weight among normal weight adolescents was found (71). According to a study done for 6078 11 to 19 years old adolescents, overweight adolescents participated in intense physical activities less frequently, and also had less favorable psychosocial correlates related to physical activity than normal weight counterparts. The psychosocial correlates of physical activity included general attitude, perceived benefits, perceived barriers, social support, and self-efficacy. The researchers concluded that interventions focusing on the same psychosocial variables may be needed for both normal and overweight adolescents to increase physical activity based on their findings that variance explained by the proposed model using eight psychosocial correlates and control variables were not significantly different between the two adolescent groups (72).

4. Parenting Style Theories

During the past few decades, a typological methodology has been developed in order to study the development of children and adolescents in the context of family (15, 73-84). Baumrind's early studies led to the development of the well-known typology of parenting styles: three styles (Authoritative, Authoritarian, and Permissive) were originally named. Then Baumrind, in her 1989 work, added one more style (Neglectful). In brief, authoritative parents are characterized as being warm, accepting of their children, being involved in their children's activities and life, involve their children in decision making and engage in discussion of limits, demanding of the appropriate maturity level in their children, and exerting firm controls on their children's behavior, and have high expectations for their children but approach these expectations in a warm manner. When children enter adolescence, authoritative parents respond by allowing more autonomy which is associated with a healthy transition from adolescence to adulthood. Authoritative parents seldom use physical punishment or harsh criticism toward their children, but instead they rely on the withdrawal of privileges as punishment for improper conduct, and also they use frequent praise and reward for child's good behavior and achievement. The children raised by authoritative parents are often portrayed to have the best developmental outcomes. For example, children in authoritative homes tend to best adapted socially and psychologically, possess advanced social skills, have well-developed emotion regulation, fairly independent, less rigid about gender-typed traits, engaged in fewer deviant behaviors such as drug use and delinquency, are more competent, tend to be more stable emotionally, and have a generally happier life than children in other family types (73-77).

Authoritarian parents are neither warm nor nurturing and hold the child up to high behavioral standards; thus meeting the expectations of parents is often a struggle for children and adolescents as parents respond with additional expectations rather than praise and support. Also, authoritarian parents tend to shape, control, and evaluate the child's life with a set of standards formulated by a higher authority. Misbehavior is dealt with by means of harsh criticism or physical punishment. Such parents do not allow children participate in family decision-making processes. Likewise, they do not expect their children to behave in a mature manner. Children in authoritarian homes tend to be dependent, depressed, and have fewer social skills and lower self-esteem. Research suggests that the children from authoritarian parents are more likely to have a low level of academic achievement and engage in antisocial activities and those problems can stem from the oppression. The effects of authoritarian upbringing in early childhood have been found to be more harmful for boys than girls (73-77).

Permissive (also called indulgent) parents are more responsive than demanding, thus they present themselves to the child as a resource for the child to use as the child wishes, not as agents responsible for shaping or altering the child's behavior. Also, permissive parents behave in positive, acceptant, affirmative, non-argumentative, and non-denying manner toward the child's actions, impulses, desires, actuations, and drives. They grant a great deal of autonomy to their children, but they do not demand that their children exhibit maturity and responsibility. Permissive parents rarely monitor and control children's behavior and do not have high behavioral expectations, instead the parents provide children with more than average freedom and little discipline and rules. Punishment of any sort is less likely when children violate rules. Children in permissive families were less self assertive, and exhibit low levels of self-control, responsibility, and maturity levels. In addition, the children were less likely to be cognitively competent and more likely to engage in deviant behaviors (73-77).

Neglectful (also called uninvolved or indifferent) parents are neither demanding nor responsive. They show a lack of interest in the activities of their children and seldom use any form of punishment. Children in neglectful homes are at risk for a variety of emotional and achievement problems. Children from neglectful homes tended to be the least competent of all.

Among these styles, researchers have come to the general agreement that children of authoritative parents are less likely engaged in deviant behaviors, more likely to perform better in school, and be mentally healthier than children raised via other parenting styles (73-77).

In her 1991 work, Baumrind presented seven parenting styles which are especially pertinent to family relations in adolescence: authoritative, authoritarian-directive, non-authoritative-directive, democratic, nondirective, good-enough, and unengaged (77). As with the characteristics of authoritative style in the four parenting style typology, authoritative parents are highly demanding and highly responsive. The permissive style was subdivided into a democratic and a nondirective styles, with the democratic pattern representing a more conscientious and engaged commitment to the child. That is, nondirective parents are rather responsive and very nonrestrictive. Democratic parents are less conventional, directive, and assertive in their control than authoritative parents. Thus, democratic parents are lenient during adolescence because they respect fro the adolescents' autonomy. Directive parents are restrictive and demanding, and not responsive. These parents valued conformity above individuality, and were more likely obedience- and status-oriented, provided an orderly environment and a clear set of regulations, and closely monitor their children's activities. The directive style was subdivided into authoritarian-directive and non-authoritarian-directive styles. The former type of parenting was intrusive, but the latter type of parenting was not intrusive. The good-enough parenting style was characterized by moderate scores on both demandingness and responsiveness indicators. Finally, unengaged parents were neither demanding nor responsive. Although adolescents from both authoritative and democratic homes were individuated, mature, resilient, optimistic, and perceived their parents as loving and influential, the adolescents from authoritative parents were more competent on most attributes than those from democratic parents. Girls and boys from democratic families tended to use more drugs than from authoritative families. Adolescents from directive homes-both authoritarian and non-authoritarian- were somewhat lacking in individuation, social consciousness, and autonomy, had an external locus of control, opposed drug use. Adolescents from authoritarian-directive homes performed poorly on verbal and mathematics achievement tests and manifested more internalizing problem behavior. These authoritarian-directive parents retarded adolescent development, and become less effective in controlling their adolescents' problem behaviors than non-authoritarian parents, but are still effective in minimizing externalizing behavior in their adolescents. Adolescents from non-authoritarian-directive parents were most concerned with seeking adult approval. They used significantly less drugs and alcohol than any other group except those form authoritative parents. Adolescents from good-enough homes were adequately but not outstandingly competent as it was predicted. Adolescents from nondirective parents were significantly less achievement-oriented, and somewhat less optimally competent and self-regulated. They were much more likely to use drugs, but not as much as those whose parents were nonengaged. Adolescents from unengaged homes were characterized by high incidence of externalizing problem behavior such as illicit drug use, and low cognitive competence and social behavior. In particular, girls from unengaged homes manifested internalizing problem behaviors.

Numerous studies reported desirable effects of authoritative parenting style on children and adolescents' developmental outcomes, but classifications of parenting styles appeared to be simpler than that reported in Baumrind (77). A study done for nine to twelfth grade American adolescents of European background showed positive effects of both authoritative parenting and closeness between parents on adolescents' school performance (85). In another study, positive associations were found between grades and authoritative parenting style, whereas negative associations were found between grades and authoritarian or permissive parenting style and the association between authoritarian parenting and grades was stronger than the association between grades and other styles among 14-18 years old adolescents (86). A study done by Glasgow et al. suggested that adolescents' attributable style provided a bridge between parenting style and educational outcomes. Adolescents who perceived their parents as being non-authoritative were more likely than their peers to attribute achievement outcomes to external causes or to low ability (87). In a longitudinal study done by Steinberg et al., adolescents who perceived their parents as highly authoritative had the highest levels of maturity and autonomy (88). A study of eighth and ninth graders regarding parenting style and adolescents' substance use and academic achievement using demonstrated the perceived authoritative parenting is associated with higher academic performance and lower substance use. Authoritative parents had the greatest chance of producing children who were successful in an academic environment and were able to resist peer pressure to use substances by putting emphasis on communication between parents and children, parents' explanation of reasons for demands they make of their children, provision of positive feedback, and greater involvement in their children's education (89). Data collected in 1996 from 151 mothers of first- or third-grade children using established self-report assessments suggested that balanced family types were positively related to authoritative parenting and negatively related to authoritarian parenting (90). Park and Bauer noted that beneficial impacts of authoritative parenting style were generally supported among studies examined European American children and their school achievements and deviance of problem behaviors (91).

While Baumrind's sequential works and other researchers' study findings well documented the relationships between parenting styles and children's developmental outcomes during childhood and early adolescence, it may be reasonable to assume that, 1) no parent would fit neatly into only one of four parenting styles described above, even though many theories and research findings support the advantages of the four-parenting classification, 2) the family environment may be experienced differently by people within the same family, thus children and adolescents may perceive their mother and father's parenting behaviors differently, 3) demographically different samples may not contain the exact same parenting styles as observed in others, 4) a child's perception of parenting may not be consistent throughout his or her development: a transition of perceived parenting may occur from one parenting style into another, which may be accounted for by a child's development domains and family environment, 5) within families, parenting behaviors may differ among siblings because of differences in gender, age, personality, and ability, 6) parent's perceived sociological status such as education, income, work-related stress level, and parent's health condition may compromise the parenting style adopted by a parent, 7) parenting behavior and children's development may need to be understood bi-directionally because parents affect children's way of thinking and behaving, and vice versa, and 8) generalization of findings from parenting style studies across cultures and community contexts may need to be cautious. Considering the complex characteristics of typological approach in an effort to understand parenting practices of parents for their children, it may be of importance to pay particular attention to determining which parenting styles are present in a random sample as the first step of parenting style research.

Finally, it may be meaningful to discuss which party's information on parenting style, between a child and a parent, may be better predictable for children and adolescents' developmental outcomes including health. Paulson and Sputa (92) observed that the way parents and children perceive parenting style differed, and outcomes in children were more related to the children's perception than to parents' perception. Also, they found that mothers were more involved in parenting than fathers. Cohen and Rice reported similar findings that children's perception of parenting style was more strongly associated with grades and substance use than was parents' perception. In particular, a child's substance use was only associated with that child's perception of lower authoritativeness and higher permissiveness. The researchers also found disagreement in perception of parenting style between children and parents; children tended to perceive parents as less authoritative, less permissive, and more authoritarian than parents considered themselves to be (89). Therefore, it was assumed that information regarding maternal/paternal parenting behaviors obtained by children and adolescents' perception may better predict the associations between parenting behaviors and child's health outcomes, compared with the information obtained from their parents.

5. Parenting Style Dimensions

A system of parenting can be neatly described by two primary categories: demandingness and responsiveness, which can further be described as levels of warmth, affection, acceptance, cohesiveness, involvement, maturity demands, firm controls, clear expectations, supervision, decision making, punishment styles, and frequency of rewards (83, 93). As mentioned above, a cross classification of demandingness and responsiveness of parenting produced the four parenting styles. Researchers utilized some of these variables (dimensions) in their investigation of the effect of parenting on children and adolescents development. Although research has generally supported the positive effects of authoritative parenting style, which is characterized as greater warmth and firm control (sometimes called as optimal balance, such as firm control in the context of warmth and loving), it is generally unclear as to which aspect of authoritative parenting is most strongly associated with children's outcomes. For example, it could be greater warmth, greater control, or interaction between these two dimensions that has the greatest impact. Furthermore, unknown mediators (or moderators) might increase or decrease the impact of parenting style on children's outcomes. Thus, examination of parenting style dimensions, apart from the exploration in terms of parenting style, may provide valuable insights into the above question: what parenting style dimension(s) are most strongly associated with certain outcomes in children. A recent study done by Kim and Rohner (94) estimated the effects of maternal/paternal warmth, control, and involvement on adolescents' school achievement. Both maternal and paternal warmth and involvement were significantly associated with school achievement measured by

GPA, while neither maternal nor paternal control was associated with better achievement at school. The study also found a moderator effect of maternal control for the relationship between maternal acceptance and school achievement. The impact of perceived maternal acceptance and adolescents' GPA was slightly diminished due to the moderating influence of perceived maternal control. Also, the authors found that paternal involvement partially mediated the relationship between GPA and paternal warmth. That is, father's involvement in adolescents' schooling was considered to be one mediator through which paternal warmth was able to influence adolescents' school achievement (94).

As was indicated at the beginning of parenting style dimension discussion, the two dimensions (responsiveness and demandingness) can be further investigated by sub-dimensions because each of them is assumed to be a combination of parenting practices characterized by similar colors or tones. For instance, maturity expectation, clear behavioral regulation, control, and punishments fall into the same category: demandingness as a whole. However, each of these sub-dimensions may be different in terms of its nature and role, which may not be detectable in the classification method of parenting styles research. Studies have explored the effects of certain parenting style dimensions on children's developmental outcomes. A great degree of maturity expectation was encouraged only in authoritative families. Researchers found that adolescents' decision making autonomy increased with age, and the increases varied according to the domain of the issue. Shared decision making is encouraged in an authoritative family, but not in other types of families. In addition, authoritative parents granted adolescents personal jurisdiction over personal issues but legitimately used parental authority to deal with other issues. In contrast, authoritarian parents were more likely to view both multifaceted and personal issues as legitimately controlled by parents, whereas permissive parents allowed adolescents to make decisions on their own. Greater autonomy over multifaceted issues in early adolescence (13 year-old) was associated with poor adjustment in a follow-up study 5 years later (95). Dornbusch et al. examined the impact of different types of decision making process on adolescents' school performance. Their findings include 'child-alone' decision making was negatively associated and joint-decision making was positively associated with adolescents' greater school achievement (96).

It may be that a shared decision making process between parents and children and adolescents may reflect the length of time a child and adolescent spends his or her time with parents. This, in turn, may help the child and adolescent to better understand his or her parent's opinions, beliefs, and attitudes, and vice versa. A recent study compared the magnitudes of support from parents and peers for adolescents' well being using 14-24 years old adolescents with or without physical impairments. Social support was measured by three perspectives: emotional support, practical support, and social companionship. Well-being was related to emotional and practical support from peers and parents, but not to social companionship with peers and parents in adolescents with visual impairments. Well-being was significantly related to parental supports, but not to the social supports from peers in adolescents without impairments. In the same study, emotional support turned out to be the most important type of support for adolescents' well-being (97). Researchers reported that higher level of family cohesion, interaction, encouragement, and achievement motivation were the underlying dimensions of the positive effects of authoritative parenting style from their study of high performing science students in conjunction with perceived parenting style. The same study also detected gender differences: a greater number of family-related variables emerged for females, whereas more motivational and science outcome variables emerged for males (98). Finally, punishments can be considered as one form of control with which parents may use to control their children. Types of punishments parents adopt can be used to identify a parenting style used by parents. Authoritarian parenting style has been characterized by use of physical punishments and psychological control. By contrast, authoritative parents rely on a less severe form of punishment such as withholding a child's privileges. Permissive parents rarely punish their parents, thus the children may develop lack of sense of responsibility about their behaviors. Statistics have shown that the use of spanking is quite prevalent in the United States as 74% of parents of children 17 years of age or younger used spanking as a discipline technique, with a decreasing trend of physical punishment as age of the child increased (99). A study examined parental physical punishment and young children's aggression (4-6 years old), maternal slapping was related to male children's aggression, whereas paternal slapping was related to female children's aggression. Parental control did not moderate any of the punishment-aggression links (100). According to Gershoff's review, parental corporal punishment was associated with all child constructs, including higher levels of immediate compliance and aggression and lower levels of moral internalization and mental health. Children who were spanked were angrier, aggressive, and stressed than children who were not disciplined in this way (101). Baumrind et al contended that corporal punishment was associated with undesirable child outcomes because the construct marks inept harsh parenting (102). Nobes and Smith studied the degree, within two parents families, to which parents' physical punishments are similar and how both parents' punishments combine. Significant levels of association were found between mother's and father's use of physical punishments for various ages of children (103). A great deal of negative effects of parental punishments has been found in the literature, especially for young children. In contrast, a number of questions on how various types of parental punishments are associated with older children and adolescents' developmental outcomes have remained unanswered. In particular, possible connections among maternal/paternal punishments, type of punishments, older children and adolescents' nutritional outcomes and other health indicators have not been investigated.

In order to better understand how maternal/paternal parenting behaviors affect children and adolescents' health outcomes, it may be useful to investigate which parenting style dimensions are more significantly related to a child's health-related variables, such as self-esteem, body images, eating behavior, physical activity behaviors, energy and nutrients intake, and the risk of being overweight.

6. Relationships with Parents during Adolescence

Adolescence is referred to as a period in which adolescents shift their reference group from parents to peers. However, Brown et al. (55) argued that parents retain a notable but indirect influence over their teenage child's peer associates. It was reported that psychological development of teenagers and their parents' mental health has been associated with the transformations in parent-adolescent relationships (104). Adolescents whose parents use authoritative parenting style that was characterized as warm yet firm, showed higher levels of psychosocial maturity than their peers who were raised by permissive, authoritarian, or indifferent parents (105). A study done by Kremers et al. (14) demonstrated critical roles of a certain parenting style in relation to adolescents' eating behavior. Fruit consumption was greater and fruit-specific perceptions were most favorable among adolescents who perceived their parents as "authoritative" than adolescent who perceived different parenting styles such as "authoritarian", "permissive", and "neglectful." Schmitz et al. (106) found that young adolescent girls who reported their mothers adopted authoritative parenting style, characterized to be responsive yet set clear behavioral expectations, reported more physical activity and lower level s of sedentary behavior, whereas adolescents boys' physical activity behaviors was not clearly associated with their perception of parenting style. The above findings confirmed the beneficial aspects of the authoritative parenting style. Although the level of parental intervention during the period of adolescence seems to be lower than that in the childhood, parents may retain their influence over their adolescents' nutrient intake, snacking patterns, and physical activity and weight loss efforts through their utilization of parenting skills. Given the multifaceted characteristics of overweight, it is important that parents have a good relationship with their older children and adolescents, such as being good role models, teaching healthy eating practices, and encouraging children's active participation in meal planning and food decision making. Each of these may play a significant role in helping children and adolescents to maintain adequate weight and nutritional status, and develop healthy eating styles, which is a very essential part of healthy life style.

7. The Theme "Gender" and Parental Impacts

Gender had been widely recognized among psychologists as an important empirical factor in understanding many aspects of behavior. In the 1950's, the roles for men and women were relatively well-defined and non-changing, while the 1960s in the US was a time during which many social institutions were being challenged including the family and gender roles**.** The traditional notions of sex roles emphasized the independence, inflexibility, responsibility for provision, and superior power position of males, while females were generally expected to be passive, subordinate, and nurturing, but past few decades have brought significant changes in male and female gender roles with new formulations of sex roles emphasizing equal power for males and females and no extensively single-gender dominated fields. Some researchers have found negligible difference between boys and girls and they more focused on maternal versus paternal parenting and ethnic differences (89, 107). While male and female perceptions may have changed regarding gender roles, those roles in the context of the family have not changed nearly as much (108). It may be that parental expectations and socialization of boys and girls continues to differ, despite changing perceptions of males and females and moves towards gender equality in many areas of life over decades.

Compelling evidence suggests that gender has a profound impact on the behaviors and competences of boys and girls that leads to sizable differences in certain domains of success. Boys are more involved in after school activities and sports, and more engage in problem behavior (109). In terms of maturity, late-maturing boys have relatively lower self-esteem, feelings of inadequacy, and more likely to be rejected or dominated by peers, whereas early-maturing boys are more popular and have a more positive self-image, but these early-maturing boys are at greater risk for delinquency and antisocial behaviors. In addition, friendship intimacy is gained through shared activities, and the adolescent-father relationship is an important predictor for adolescent boys' development (110). Girls are cognitively more competent, yet they are more inclined to experience internal problems of anxiety and depression (111). Before puberty, girls usually have better social skills and a lot of confidence, whereas after puberty, girl's self-esteem drops markedly with a peak at the age of 12-13. In addition, girls tend to worry about their bodies and diets and social relations among family members are all related to adolescent girls' behaviors and competence. Overall, difference in academic performance, problem behavior, and psychological adjustment are known to vary by gender during middle childhood. Behaviors can further diverge during the early adolescent years as gender becomes an even more salient source of differentiation. According to a study that examined gender difference in the areas of academic competence, behavioral problems, activity involvement, and mental health for older children and young adolescents, girls scored significantly higher than boys on academic performance and cognitive competence, but the degree of academic competence gradually decreased as females get through the age 11 and 12; boys scored significantly higher than girls on behavioral problems, especially age 13-14+, whereas females were not significantly engaged in behavioral problem until age 13; boys had significantly higher involvement in sports. The highest level of sports involvement was seen at boys' age 13. When females were 13 and older, their participation in activity, such as after-school and summer program, significantly decreased; females, starting during adolescence, are twice as likely to be depressed as males. While girls report higher levels of depression, they also have a greater sense of efficacy and self-satisfaction. Therefore, the global measures of child's well-being were not distinct by gender (112). Researchers found that aerobic exercises were as effective as other forms of psychotherapy and the exercises have an antidepressant effect on women patients with mild to moderate forms of depression. They suggested that increased level of physical activity in boys, compared the amount of exercise of girls in general, may explain decreased level of depression among boys (113). The findings on gender differences in developmental outcomes further suggest the need for researchers to expand their attention to the similarities and dissimilarities between the two genders in the area of child health related behaviors and their outcomes in an attempt to increase our understanding of whether gender is a significant predictor of children and adolescents' heath related behaviors. Potential candidates for the examination of health behaviors among youth in conjunction with gender may include dietary behaviors, physical activity behaviors, body image, health attitudes, and nutritional knowledge.

It may be logical to examine important contributors to the differences between boys and girls through the developmental courses. Biological differences, gender images portrayed by media and playing games (114), social interactions such as differential treatment by teachers, social structure such as gendered power system in a certain culture (115), and different socialization by parents are among those for which the researchers approached to understand the underlying force for the appearing differences between the two genders. Among these, parental socialization of their children takes the special attention in the present study because the study aims to identify parental influences on children and adolescents' health outcomes. Parents expect and socialize their sons and daughters in different manners. Differential socialization could be grounded in biological differences but enhanced by differential treatment by parents and others based on cultural criteria. Parents behave differently when interacting with female versus male children. Sex-stereotypical socialization practices by caregivers may lead to gender differences in self-concept in boys and girls. It may be that parents are more likely to engage in active and energetic play with male children and they expect boys will be more independent, whereas parents treat girls more protectively and give more restrictions and physical attentions and they expect girls will be more nurturing. Although both math ability and performance has been known as "gendered" in that at certain ages, boys demonstrate higher average ability and higher performance, studies showed important role of parents on children's academic abilities, especially girls'. The research found the higher the disagreement about the intellectual orientation between fathers and daughters, and fathers, mothers, and daughters, the lower the math achievement, whereas no significant relationship were found for son-parent combinations (116). In a study measured within-gender variance on math ability of boys and girls, girls' ability and performance scores were predicted by parents' expectation of them. To the extent that parents form rigid ideas about the math ability and behavior of boys and girls, and act on those ideas, differences between boys and girls are likely to be exaggerated, if not actually created (117). A study done by Updegraff (118) indicated that the drop in math and science grades only occurs in girls from traditional families where gender roles are emphasized and the mothers are assigned the child-rearing role. Girls from egalitarian families were apparently not taught that technical subjects were too hard for them or inappropriate for females. These girls spent seven more hours per week with their fathers than girls in traditional families.

In addition, researchers studied gender difference of parental influence in various domains of child development. According to a study done by Javo et al. (119), girls were less likely to internalize or externalize problems if they were shown warmth by their parents and more likely to internalize or externalize problems if their parents used physical punishment. Girls were more likely to externalize problems if their parents teased them. Schiff and Mckay (120) study showed that black female older children displayed significantly higher levels of externalizing behavioral difficulties than male children when exposed to violence, and mothers' lower level of monitoring had a significant direct association with the total externalizing behavior and delinquency. Cross and Madson (121) discussed that adolescents and adult females construct interdependent 'selves", and being tuned to others' feelings, thoughts, and the quality of the relationship with them more than adolescents and adults males. The researchers suggested that family distance might lead adolescent females to find relatedness among peers, including delinquent ones. Pychyl et al. (122) reported that female adolescents' self-worth was positively associated with maternal authoritative parenting and negatively associated with maternal authoritarian parenting. In contrast to this, neither paternal authoritative nor paternal authoritarian parenting affected female adolescent's self-worth. Shek (123) noted that fathers were perceived to be relatively more restrictive and showing less concern than the mothers. Cookston (124) study showed medium to high level of parental supervision were associated with female adolescents' less drug use, whereas only high level of parental supervision was associated with male adolescents' outcome. Weiss and Schwarz (81) suggested that parent's demandingness appears to be less critical to girls' well being compared to boys'. Choo (125) examined relationships between maternal versus paternal parenting style dimensions and adolescents' psychological outcomes. The findings included that maternal warmth was the strongest parental correlates of adolescent's autonomy development, and maternal support and involvement were strongly related to adolescents' outcomes, whereas paternal warmth was more moderately correlated with well-being of the adolescents. Father-adolescent communication was less strongly linked than mother-adolescent communication in terms of adolescents' psychosocial competence. Coercive and psychological control by father was highly correlated with psychological maladjustments than was mother control. Macoby and Martin (78) indicated that boys appear to be more responsive to behavioral restrictions accompanied by parental warmth than girls.

In an earlier investigation, Costanzo and Woody (126) suggested that parenting style is tailored to the child based on parental concerns in a specific domain, thus children's psychological and physical outcomes should be studied in a domain-specific situation. Evidences for differential impacts of maternal and paternal behaviors on children's developmental outcomes are compelling. Therefore, investigation of the associations between maternal/paternal parenting behaviors and children/adolescents' health-related behaviors and outcomes may shed light on our way to understand the underlying factors for weight-related problems among youth such as overweight and eating disorders. If we expand Costanzo and Woody's domain-specific differential concerns for boys and girls to various health-related behaviors such as development of body images, eating behaviors, physical activity behaviors, and energy and nutrients intake, it is likely that maternal and paternal parenting behaviors may have differential influences on children/adolescents' health outcomes based on parents' specific concerns for boys and girls.

8. Family Meals and Parental Influences

The attention paid to the role that the family meal might play in the current youth obesity epidemic is growing because family meals appear to play an important role in promoting positive dietary intake among children and adolescents. It is generally agreed that parents play a critical role in various domains of developmental course of children and adolescents in various ways such as minimizing problem behaviors and maximizing socialization (127). Researchers found positive relationships among parents' presence at mealtime, positive atmosphere at meal time, parents' role model for appropriate food-related behaviors, and children's improved dietary quality (128). A study showed that more than 80% of parents rank eating dinner together as either one of the most important activities or a very important activity, compared with other activities done with their children. Gillman et al. (16) examined the frequency of family meal events and children and adolescents' diet quality. The findings include that participants who ate family dinner more frequently reported slightly higher energy intakes and also reported substantially higher intakes of several nutrients, including dietary fiber, calcium, folate, vitamins B_6, B_{12}, C, and E, and iron. In addition, they consumed less trans fat and saturated fat as a percentage of energy intake, and had lower glycemic loads. Overall, the study showed that family dinner is associated with healthful dietary pattern. One analysis of the National Longitudinal Study of Adolescent Health described parental influences on adolescent food consumption along with the contribution of sociodemographic characteristics and body weight perception (129). Almost 20% of subjects reported skipping breakfast the previous day. A large percentage of adolescents consumed less amount of vegetables (71%), fruits (53%), and dairy foods (47%) than the recommended amounts for each food group. Parental presence at the evening meal was associated with a lower risk of poor consumption of fruits, vegetables, and dairy foods as well as the likelihood of skipping breakfast. Parents' lower level of education and adolescents' self perception of overweight were also significant predictors for adolescents' poor consumption pattern (129). Similar results were found in a cross-sectional study design in which adolescents aged 11 to 18 participated in the EAT

(Eating Among Teens) survey. About one third of participants ate dinner with family less than two times during the previous week. Increased frequency of family dinner was associated with male gender, Asian American, mother's non-employment, and higher socioeconomic status. Although frequent family meals were associated with higher energy intake, only percent energy from protein was significantly increased. Moreover, adolescents tended to consume more calcium, iron, folate, fiber, vitamin A, C, E, and B_6 in conjunction with frequent participation in family meals (130). Findings from numerous studies seem to convey the ideas that parents make decisions concerning food purchases and preparations which may influence their children's food selections and eating behaviors, therefore, the parents may directly and indirectly affect their children's decisions about foods and may also affect their adolescents' food choices, dietary behaviors, and physical activity behaviors, although the degree of parental impact may be less than that for school-aged children. Children view their parents as role models and the eating habits of parents may significantly influence the diets and eating habits of children, therefore, it may be that parents who have nutrition-based food knowledge and who practice healthy eating habits are more likely to raise children who develop and practice similar healthy eating habits. In contrast, parents who do not encourage their children to practice healthy eating habits and do not emphasize the importance of nutrition, may more likely raise children who develop and practice unhealthy eating behaviors, such as consuming energy-dense, non-nutritious snack consumption, and which thus may lead to develop obesity or other food-related diseases or complications. In summary, family meals may be the arena where parents express their food-related norms, beliefs, and attitudes about their family members' dietary patterns in an attempt to improve the family members' eating behaviors and health outcomes.

9. Parenting Styles and Parental Feeding Strategies

A considerable amount of studies examining the factors that are relevant to young children's food choices and food related behaviors have been conducted to date. Familial influences, especially parental effects have been paid a great deal of attention in order to understand the influence of various child's feeding practices and its association with the course of child development. The specific areas of parental influence studied regarding young children's eating behaviors and weight status include development of food preferences and acceptance (131-134), parental nutrition knowledge and attitudes (135), comparison between maternal and paternal influences (136), various food practices such as food rewards (137), and maternal employment (138).

Costanzo and Woody (126) found that parental restraint of a child's food intake was highly correlated with a child's increased externality and decreased internalized control for food intake, and this effect was more prominent among female adolescents. They also indicated that parental concern-derived constraints may adversely affect children's ability to self-regulate eating and promote the problems these parents attempt to avoid, which results in the development of obesity-prone behaviors. Parents seem to become highly concerned if they perceive that their child's weight status deviates from generally accepted social-cultural standards. The detrimental effect caused by a high level of concern of parents is more prominent among daughters (126). Recently, attention paid to parental feeding styles in an attempt to understand the characteristics of children's eating behaviors has been growing. One important root of parents' feeding style research may be the classic parenting style theories. It seems that parenting style and its characteristics can be reflected in feeding styles and practices. A study done by Klesges et al. (139) showed a significant correlation between parental encouragements to eat, a domain-specific behavior, and the development of childhood obesity. The study also found that authoritative parents promoted the development of self-control for children and thus reduced risk of obesity. In contrast, authoritarian parents and permissive parents exerted too much control and lack of control, respectively. Consequently, both of these parents may hinder the children's proper internalization of eating control. Birch also suggested that authoritative feeding style which fosters the development of child's self-control is assumed to be the most optimal parenting practice in the attempt of prevention of childhood obesity (140). In a study done by Fletcher and Branen using 546 individuals in late adolescence, the researchers adopted Baumrind's parenting style theory as the conceptual frame for the study. The researchers classified the subjects into two groups based on their perception of parents' feeding practices; adult-controlled style which reflect authoritarian parenting style and cooperative style which implies authoritative style. Positive correlations were found between subjects' perception of their caregiver's feeding styles and their perceptions of the styles they believe they will use with their children. For the feeding practices from which feeding styles were drawn, positive correlations were founds between subjects' perceived past and future feeding practices. Overall, the researchers suggested feeding styles and practices can be transmitted from generation to generation, although the suggestion is based on the subjects' belief. This research shed light on our understanding about a link between parents' general parenting style and food-specific feeding style (141).

Considerable evidence showed that highly controlling and restrictive parental feeding style contributed to positive energy balance and higher BMI by interfering with children's ability to self-regulate energy intake. According to a model proposed by Birch and Davison (142), several family similarities were found regarding eating patterns and weight status: a child's weight status is influenced by parental weight, parental eating style, parent's child feeding practices, and the child's own eating behavior. They found that parents who had undesirable food habits such as low fruit and vegetable consumption tended to use greater pressure to foster their children's greater consumption of such foods. The consequence, however, was the opposite of the parents' intention to increase children's nutritious food consumption because parents' pressure to eat nutritious foods was negatively associated with their children's intake of those foods and positively associated with the intake of non-nutritious foods such as fats. In other words, pressuring children to eat more healthy foods ultimately decreases preferences for those foods, while restricting children from access to unhealthy foods increases children's desire to have and consume those foods when no parental supervision is provided. Satter pointed out a division of responsibility in which it is the parents' responsibility to supply the child with a healthful array of foods and supportive eating context, and it is the child's responsibility to decide when and how much to eat, as a solution on which both parent and child can rely on to improve childhood obesity (143).

Researchers have agreed with the notions that parents' control may interfere with child's ability of self regulation and children are more likely to pay attention to external cues than internal cues such as hunger and satiety, and thus child feeding practices can be a barometer of the parent-child relationship (139, 143-148).

However, some researchers failed to find negative effects of parental control over children's eating. Using an ethnically diverse sample composed of 8 and 9 year old children (149), Robinson et al. found that parental control over children's intake was inversely associated with overweight in girls, and no relationship was found between level of parental control of children's intake and overweight in boys. This finding suggested that effects of certain parenting style dimension may be multi-factorial, and thus ethnicity, socioeconomic status of study sample, and study subjects' age and gender may be among the important factors to include (149).

Researchers have indicated certain food preferences or aversions are developed before and during childhood (140, 150), even as early as infancy (131). Nonetheless, it might be that parents, teachers, and other influential adults continuously guide children in developing healthful eating patterns and acquiring information about nutrition and diet-health relationships. It must be noted that most of studies regarding parental influences such as feeding style on children's eating behaviors and weight status were limited to young children such as preschoolers or even toddlers and infants. Studies on parental influences on older children and adolescents have been largely neglected. One possible reason for the lack of studies on the level of older children and adolescents might be the researchers' preconceived assumption that parental influence on children's diet may diminish as children grow older. It may be true that adolescence is a period that a lot of changes including physical, psychological, and behavioral occur and relationships between adolescents and parents become less close as peers begin to serve as significant role models. However, some researchers found that parents retain a notable but indirect influence over adolescents' life (55). It is generally believed that dietary pattern established in childhood and adolescence may significantly influence the dietary pattern and probability of acquiring certain diseases as an adult. Given the research outcomes predicting young children's eating behavior and abnormal weight status using parents' child-feeding practices, expanding our attention to the effects of parental feeding style on older children and adolescents' eating behaviors may fill gaps in the literature and provide a better understanding of how parents influence children of all ages' and adolescents' eating behaviors and other health outcomes. Most of all, it may be of great interest to determine whether the negative effects of parental control on young children's eating domain would be consistently found for older children and adolescents' eating behaviors and health outcomes. In addition, it may be of importance to identify the most important parental behaviors that influence children's health-related behaviors, such as eating habits and physical activity behaviors, and children's obesity because such findings can then be reflected in the development of effective programs for prevention of obesity epidemic among children and adolescents.

CHAPTER III

RESEARCH OBJECTIVES AND HYPOTHESES

1. The Need for a Multi-Disciplinary Perspective

When a child matures from childhood to adolescence during the process of puberty, dramatic changes occur in the child's body and mind, and such changes may directly influence the child's own perception of himself (or herself) and of his (or her) parents. It seems reasonable to expect that some changes will occur in the relationship between a child and a parent during and after pubescence. Researchers from nutrition-related fields have put a great deal of emphasis on the growing health epidemic among the U.S. youths: overweight. In recent years, they have turned their attention toward environmental factors to seek underlying links between the child's environment and the prevalence of overweight. Family income, parent's level of education, and parental obesity have often been associated with children's overweight. However, no single study has made an effort to explore the potential roles of parenting behaviors on child's health-related behaviors and a broad set of health outcomes, such as including the children's self-concept, eating behaviors, physical activity behaviors, energy and nutrients intake, and body fatness, all of which contribute to his (or her) overall health status. Therefore, this research is needed to bridge the knowledge gap in the current literature in order to provide a more balanced perspective of how parent's parenting behaviors are related to the child's health. The strengths of this study may include: 1) a comparison of the child's perception of the parent's parenting behaviors among older children and young adolescents, 2) a comparison of perceived parenting between boys and girls, 3) an examination of the child's self-concepts, eating behaviors, physical activity behaviors, energy and nutrient intake, and body measurements as predictive indicators of the child's health status, in conjunction with their perceived parenting style, 4) a distinctive investigation on how the parent's own socioeconomic, psychological, and physical status is related to his (or her) parenting style, and 5) a comprehensive focus, examining both more recent as well as earlier research from a multidisciplinary perspective. Various fields, such as nutrition, psychology, sociology, education, and economics, will provide sources of insight into the study of outcomes, culminating in a global, holistic examination of this important issue.

2. The Objectives of Research

Of the many contexts in which children and adolescents develop, none has received as much attention as the family (24). Parents play a central role in children's development by utilizing different degrees of involvement in their children's life throughout the process of child and adolescent development. While researchers have extensively applied the theories of parenting styles and its dimensions to the understanding how parents' child-rearing practices influence children and adolescents' development, including school achievement, social competence, psychological well-being, deviant behaviors, and peer group orientation, only small amount of attention has been paid in exploring how parenting behaviors influence children's health behaviors and outcomes. Pole et al. (151) compared the degree of parental caring perceived by both bulimics and controls, and found bulimics thought their mothers were significantly less caring. A study done by Hill et al. (152) examined the relationship between children's dissatisfaction with family functioning and children's eating disorders. He found a negative relationship between satisfaction with family functioning and children's eating disorders. It seems that parents especially shape children's eating environment by influencing food availability, children's attitudes, knowledge, choices, and self-control toward foods as well as modeling eating behavior and mediating the emotional tone of meals. It may be that if children/adolescents perceive an undesirable relationship with their parents, then their perception may, in turn, stimulate adolescents to develop a lower self-esteem, and a propensity toward deviant behaviors such as unhealthful eating behaviors, lack of physical activity, and excessive participation in sedentary activities, all of which may lead to undesirable health status. Being overweight or morbidly underweight may be the major negative outcomes of adolescents' eating deviance.

As discussed previously, family meals may be the arena where parents can implement their food-related norms, beliefs, and attitudes toward their family members' health status including eating patterns and activity behaviors, and body images. Therefore, examination of various family meal-related behaviors, such as frequency of family meals both at home and away from home, perceptions about family meals, food-related decision making, parental food-related control, use of family meal time for praise or punishment, may provide insights into how family meal behaviors are associated with parenting behaviors and children's health outcomes. In addition, findings on the significant associations between parenting style and feeding style as well as predictability of children's eating behaviors and weight status by family meal patterns suggest the possibility that family meal behaviors may mediate the relationships between parenting style (dimensions) and children's health outcomes. Therefore, both direct effects and mediating effects of family meal behaviors on the children and adolescents' health outcomes will be examined in order to better understand the role of family meals on child health outcomes.

The present study aims to assess 1) if the effects of authoritative parenting style on children and adolescents' health outcomes are consistent with our knowledge about the effects of authoritative style on other domains of child development such as academic performance and socialization, 2) which parenting dimensions are more accountable for self-concept, dietary behavior, physical activity behavior, energy and nutrients intake, and body measurements for children versus adolescents, 3) which parenting behaviors are more importantly associated with various health outcomes for male versus female subjects, 4) how family meal-related behaviors are associated with children's various health outcomes indicated above, and 5) if family meal behaviors mediate the relationships between parental parenting behaviors and children's health outcomes. Therefore, attention will be paid to possible significant differences between children and adolescents with respect to their perceptions of their maternal and paternal parenting behaviors. Examination of maternal/paternal effects on male versus female subjects' health outcomes may add our understanding to gender difference in relation to the issue "parental influence". A study may be helpful if it can suggest an optimal parenting style and an ideal combination of parenting style dimensions that lead to the best in nutrition and health outcomes for each gender of children and adolescents.

The major purpose of this study is to examine the relationships between parenting behaviors (using parenting styles and parenting dimensions) and children's and adolescents' health outcomes measured by self-concept, eating behavior, physical activity behavior, energy and nutrients intake, and body measurements. A series of hypotheses regarding parenting behavior toward children and adolescents' health outcomes are as follows:

1) The degree of parenting behaviors in terms of parenting style dimensions may be perceived differently by older children (ages of 9-11) than by adolescents (aged 13-15).

2) Maternal and paternal parenting may play a different role in children's health outcomes compared with that of adolescents.

3) Maternal and paternal parenting may play a different role between boys and girls.

4) Each of the parenting dimensions may have differential effects on the child's self-esteem, body image, eating behaviors, physical activity behaviors, and ultimately the child's nutrition status and risk of being overweight.

5) Having authoritative parents may predict that children (both older children and young adolescents) will develop better health related behaviors. For instance, the more authoritative the parents are, the less likely children will skip breakfast, the less likely

children will consume calorie from fats, and the more likely the children will consume essential nutrients.

6) Non-authoritative parenting style including authoritarian, permissive, neglectful, or mixed style, may be less desirable for children and adolescents' health outcomes.

7) Family meal behaviors may have associations with parenting style (dimensions) and children's health outcomes. In addition, certain family meal behaviors may mediate the relationships between parenting behaviors and child health outcomes.

8) A family's income, parent's socioeconomic status, parental work related stresses, and parental obesity status may affect parenting style and use of parenting style dimension that parents adopt for their children and adolescents.

The objective of this research is to discover if significant relationships exist between parenting behaviors (measured by parenting styles and parenting style dimensions) and child/adolescent health outcomes (measured by eating behavior, physical activity behavior, energy and nutrients intake, and body measurements and risk of overweight) with additional examination of the roles of family meal behaviors in the contexts of parental influence and children's health outcomes. The parenting style dimensions studied in the present study include care, clear behavioral regulation, help, maturity expectation, lack of punishment, high achievement expectation, immaturity expectation, psychological punishment, punishment by withholding privileges, harsh punishment, and praise. In addition, three types of decision making process may be taken into account: shared decision making, parent-alone decision making, and child-alone decision making. A brief summary of research hypothesis is reflected in Figure 3-1.

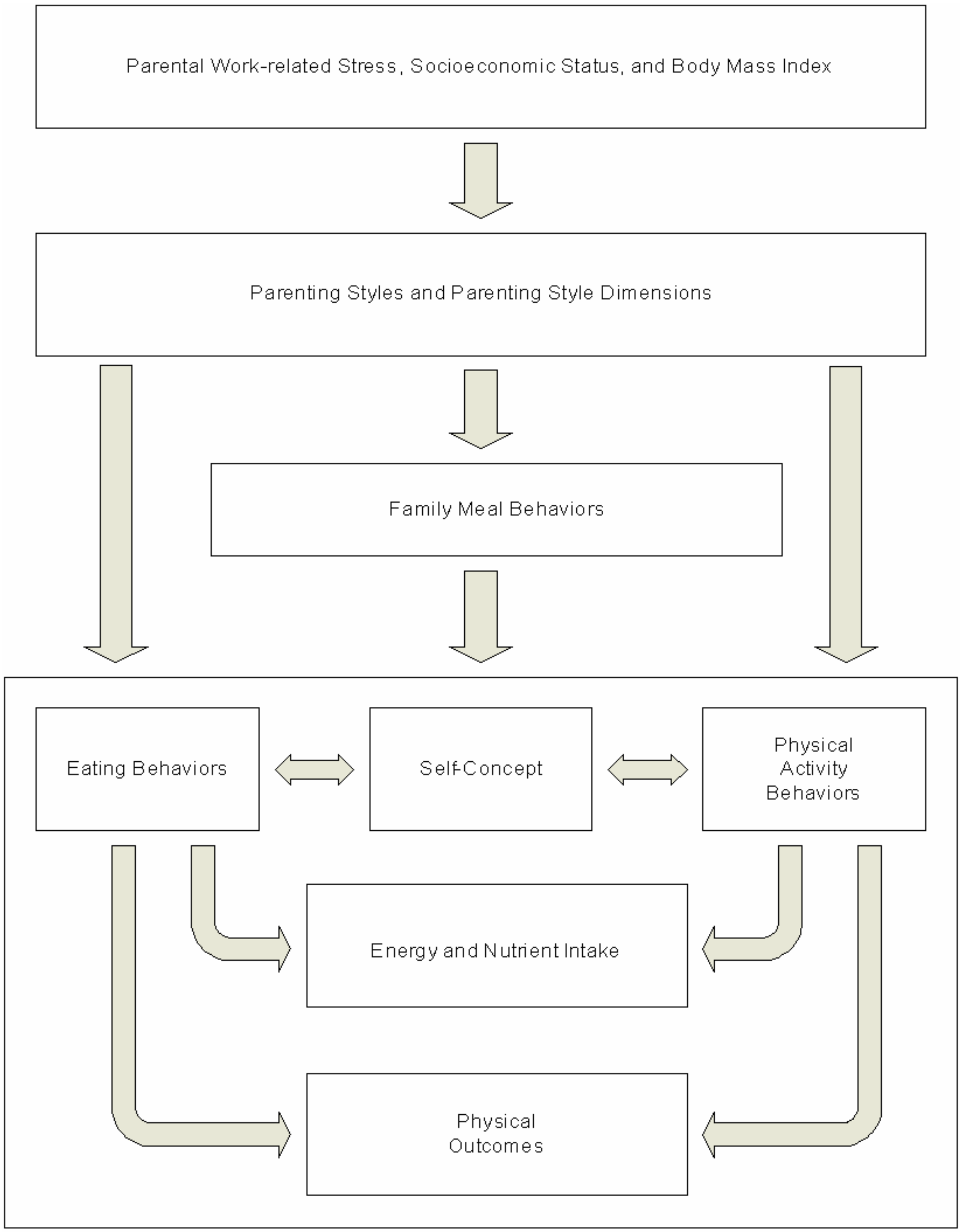

Figure 3-1. A diagram of research hypothesis regarding parenting behaviors and older children's and young adolescents' health outcomes

CHAPTER IV

SURVEY METHODOLOGY

The data for the present research is drawn from the "Parental Time, Role Strains, Coping, and Children's Diet and Nutrition" project which was funded by the USDA Food Assistance and Nutrition Research Program. The overall scheme of the project was approved by The Institutional Review Board of Texas A&M University, and the data were collected between July 2001 and June 2002. The present study was also approved by the same review board.

1. Sampling

The data were collected from the Houston Metropolitan Statistical Area (MSA), Texas. The Houston MSA has the largest concentration of minority groups in the state, and it is urban but includes several rural communities (153). Median family income was $51,212 with 11.1% of families living below the poverty level. Among employed people, 35.3% held managerial or professional positions; 28.7% of children under 18 lived with two parents; and 99% of these children also lived in families were both parents are employed (153). While census data showed that the ethnicity of the Houston MSA is comprised of 46 % White, 17.2 % Black, 5.2 % Asian, and 29.9 % Hispanic (153), the study sample turned out to be (for fathers) 81.6 % White, 4.5 % Black, 2.0 % Asian, and 11% Hispanic; (for mothers) 76.0 % White, 11.4 % Black, 1.3 % Asian, and

11.0 % Hispanic; (for children) 71.6 % White, 11.3 % Black, 1.6 % Asian, and 12.9 % Hispanic.

The original project aimed to obtain data of pre-pubertal and post-pubertal children to examine the potential influence parents have on children. It was noted that as children progress through adolescence, parental influence begins to wane as peers become an increasingly important source of influence (154). Thus the age 12 was excluded from the sampling based on the consideration that 12 years old is the age at which many children undergo puberty. The data were obtained from one child between the ages of 9-11 or 13-15 and from both of the child's parents in dual headed households or from one child in the same age categories and from that child's mother (to obtain data from female headed households). These age groups were selected because problems arise in children's ability to provide detailed data about themselves when they are younger than age 9, and parents have been shown to have increasingly less influence on adolescents over the age of 15. Children aged 9 and above can be expected to provide reliable responses to semi-structured interviews, are more likely to understand health and posses knowledge of nutrition, and are at the age where intervention may be critical for life-long health (154).

The first phase of sampling was conducted using Random Digit Dialing method. A sample of ten-thousand randomly generated phone numbers was obtained from Survey Sampling, Incorporated. This number was based on an estimated contact rate of 50 percent, cooperation rate of 50 percent, and completion rate of 60 percent. This phone number base was used in order to minimize calls to unassigned, business, or government agency phone numbers. An advantage of random digit dialing as compared with published phone numbers is that random digit dialing allows the inclusion of unlisted phone numbers in the working population of phone numbers. In addition, it is cheaper and faster to generate a sample by phone than by in-person contact. On the other hand, it results in lower response rates possibly because it is harder to turn someone down in a face-to-face situation. In person, it is also easier to prove the authenticity of the project by showing identity cards, etc (155). Telephone center research assistants were trained regarding how to make cold calls to households using randomly generated phone numbers and a prepared 'script' designed to obtain maximum response; how to interview parents over the phone. A sample of over 300 households was generated through the Random Digit Dialing method over 15 month period. Additionally, this sample was disproportionately stratified because of an attempt to over-sample female-headed households so they would represent 20% of the families interviewed. In actuality, the sample contained 18.6 % single mothers. Initial contact with households ascertained the eligibility of at least one parent and a child in the proper age range who were willing to participate. If a family expressed interest in participating during the initial contact call, a consent form for the mother and father (if present), and an assent form for the child were mailed to their residence along with a self-addressed, stamped envelope. When the consent and assent forms were returned to Texas A&M University, a file was created for the family, and a scheduler called to set up an appointment for the child household interview and the parent telephone interviews (see Appendix G). At this point, the scheduler called an interviewer trained in dealing with children and adolescent respondents to give pertinent information about the interview appointment and directions to the child's residence. The interviewers for children's/adolescents' in-home interview were trained over a 4-day period by Drs. McIntosh, Kubena, and Anding. The contents of interviewer training course included 1) purpose of the study and rationale for the questions in the questionnaire as well as research ethics; 2) multi-pass 24-hour diet recall procedure and use of food models (2-dimensional models-pictures); 3) anthropometric techniques; 4) training research subjects how to maintain a 2-day food intake diary.

The size of the final sample used for the present study requires discussion. Originally, three-hundred and twelve children / adolescents (159 boys, 153 girls) completed the interview and diet records while 58 single mothers and 254 two-parent households (245 fathers) completed telephone interviews and self-administered questionnaires. The present study, however, excluded the children and adolescents from female headed households based on the assumption that a mother who is the head of the household may adopt differential parenting style for their children compared with a mother from dual-headed households (e.g., type and frequency of punishment a mother uses for a 15 year old female child). Also, children's data from dual-headed households was needed in order to examine one of the most important research objectives: identification of differences between mothers and fathers in terms of parenting styles they adopt for their children. Unfortunately, exclusion of children from female headed households greatly reduced the size of study sample. In addition, subjects who reported unreasonable amount of energy intake (< 200 Kcal) were excluded from all of statistical analysis. The final sample size for children and adolescents became 127 and 106, respectively, after excluding subjects who met the above conditions. The study sample consisted of 123 males and 117 females. The present study aimed to examine how maternal and paternal parenting behaviors are associated with children's health outcomes in conjunction with child's gender as well as with the course of puberty. Because of the resulting small sample sizes, this study could not divide the sample into four subgroups - male children, female children, male adolescents, and female adolescents - for separate analyses. Therefore, exploring maternal/paternal impacts for four groups of children's was virtually impossible. Instead, a set of statistical analysis will be conducted for the two age groups: older children and young adolescents, and then the same analysis methods will be applied for the two gender groups. It was expected that findings from two sets of analysis may increase our understanding of how mother and fathers affect their children and adolescents as well as sons and daughters through their parenting behaviors, although the study design is unable to provide direct interpretation of maternal and paternal impacts on children and adolescents' health by their gender.

2. Survey Instruments

2.1. Child and Adolescent Questionnaire

The Adolescent Survey Instrument (designed for 9-15 year old children and adolescents) consisted of a survey questionnaire, 24-hour diet recall, 2 days of diet records, anthropometry record, and Tanner stage measurement. Data obtained through the questionnaire includes the child's perception of general parenting behaviors, relationships with parents, child's self-esteem, child's health related behaviors such as dietary habits and physical activity behaviors, perception of body images, and family meals. The study subjects responded to both the mother version and the father version of questions regarding perceived parenting style. The reliability and validity of all the methods adopted for this survey research have been tested through two previous pilot studies using 14-15 year-old local adolescents (156, 157). The pilot studies made use of previously applied data collect instruments (e.g., the Rosenberg Self-Esteem Scale), which have known validity and reliability (158). The survey questionnaire has been used to elicit health and nutrition information from adolescents in the previous studies. The entire survey instrument is found in Appendix H.

2.2. Parent Questionnaire

Both mothers and fathers underwent an identical 30-minute interview over the telephone that was scheduled at their convenience, and trained interviewers conducted the telephone survey. Questions in the telephone survey included information regarding employment, working conditions, health status and practices, and parental feeding practices for their children. The present study adopted a series of questions regarding parental work related stress from the parents' telephone interview survey (see Appendix I). In addition, the parents completed a self-administered questionnaire with the aid of comprehensive written instructions. The self administered questionnaire was developed to examine the effects of parental time and income constraints on dietary intake and health outcomes in children and adolescents. Family income was one of the control variables used in the present study, and the necessary income information was drawn from the self-administered questionnaire.

2.3. Multi-Pass 24-Hour Recall and Diet Record

Two weekdays and one weekend day were randomly selected during either the summer or school year depending upon when the interview was conducted. The two days for keeping the food records were selected based on the date of the interview. Children and adolescents' daily energy and nutrient intake data were collected by conducting one multi-pass 24-hour recall and instructing the subjects to keep diet records for two days (see Appendix J). The multi-pass 24-hour recall method consists of three distinct passes: 1) collection of a quick list of foods - probing (time/ place/ brand name/ portion size/ preparation method; 2) creating a food forgotten list; food details; 3) doing a final review in order to solicit any changes or additions (159). Although researchers have argued about the insufficient validity of standard 24-hour diet recall when compared to doubly labeled water method (160, 161), multi-pass 24- hour recall is assumed as the most accurate dietary data collection method given its advantages: relatively minimal respondent burden, completely open-ended, ability to accommodate any level of food description, ability to accommodate diversity in study population, and the ability to use well trained interviewers in order to increase the accuracy of dietary data (162).

For the two days of diet record, the subjects were instructed in detail and they were provided measuring cups and spoons, a ruler, and two-dimensional portion-size booklets as a visual aid for estimating amounts of foods eaten (163). The booklets were left with the respondents in order to assist them in estimating portion sizes in their food records. The same interviewer who conducted the multi-pass 24-hour recall obtained the food records over the phone on a scheduled day by adopting the probing and final review techniques of multi-pass 24-hour recall method in order to increase the accuracy of food record data. In order to code the dietary data, student workers were fully trained by Drs. Jenna Anding and Karen Kubena (registered dietitians and co-investigators on the original project) to reduce possible coding related errors. The coders were instructed to find exact food composition information from external sources such as grocery stores and restaurants when food items were unclear in terms of their names or portion size or when the Food Processor database did not provide the exact matching food items. The dietary data collected by the recall and records were averaged for energy and nutrients using the Food Processor SQL Nutrition Analysis and Fitness Software (164). Drs. Anding and Kubena trained four nutrition undergraduate majors to code the food intake data for entry into the Food Processor SQL. Daily averages were then transferred to the Statistical Analysis System (SAS) for further analysis.

2.4. Anthropometry

Height, weight, waist and hip circumference, and triceps and subscapular skinfold measurements were obtained by trained interviewers following procedures described by Lohman et al. and Lee and Nieman (165, 166) (see Appendix K). Children were asked to dress in light clothing and their height and weights were measured with their shoes having been removed. Height was measured to the nearest $1/8^{th}$ of an inch using a non-stretchable metal tape measure and a metal triangle while the subject was wearing light clothing, no shoes, and standing on a non-carpeted surface. Weight was measured to the nearest 0.5 pound using a 12” by 12” 500 pound parcel scale (Scales Plus, Collierville, TN). After conversions of measurement units (inch**es** into centimeter**s** and pound**s** into kilogram**s**), body mass index (BMI) was calculated for each subject. BMI (body weight in kilogram divided by height in meter squared) is a measure that adjusts body weight for height, and it is an accepted measure for defining overweight in children and adolescents (114, 167). Unlike the definitions of “overweight (BMI ≥ 25)” and “obesity (BMI ≥ 30)” used for adults, the Centers for Disease Control and Prevention (CDC) defined overweight for children and adolescents as BMI at or above the sex-and age-specific 95th percentile BMI cutoff points from the 2000 CDC Growth Charts (168). Also, the BMI percentile “at or above the 85^{th} percentile, but less than the 95^{th} percentile on the CDC growth charts” is called “at risk for overweight” (168). Each subject’s BMI percentile was calculated using the SAS program developed by the CDC, and the resulting percentiles were used in the data analysis. Waist circumference was measured to the nearest 0.1 cm at the narrowest area below the rib cage and above the navel using a flexible nylon tape measure. Waist circumference (WC) is an indicator of central obesity, and it provides more accurate indirect measure of visceral fat given because WC is not highly influenced by age, gender, standing height, and degree of overall adiposity. Also, high correlation**s** between WC measure and MRI (Magnetic Resonance Imaging**)** and CT (Computerized tomography**)** measures of intra-abdominal fat suggest the validity of WC use for abdominal fat estimation (169). It has been shown that central obesity may be a more important risk factor for cardiovascular outcomes than peripheral obesity. Central obesity is associated with increased insulin resistance, higher circulating insulin levels, elevated blood pressure, and decreased HDL-cholesterol (170). Triceps and subscapular skinfold measurements were taken on the right side and were done in triplicate to the nearest millimeter using a Lange Skinfold Caliper (Cambridge Scientific Instruments, Cambridge, MD). Three measurements were allowed to be used only when each of three repeated measurements was within one centimeter from each other. The average of the three measurements for each skinfold was used in the study. Triceps and subscapular are frequently used locations to estimate the amount of subcutaneous body fat in nutrition survey research. The level of body fatness affects the relative amount of fat located internally and subcutaneously, and the proportion of internal fat decreases as overall body fatness increases. It is known that relative subcutaneous and internal fat distribution is similar for all individuals within each gender, thus skinfold method is a good measure of subcutaneous fat. Individuals with large values are reported to be at increased risk for hypertension, type II diabetes mellitus, CVD, gallstones, arthritis, and other disease, and forms of cancer (169).

Tanner stage assessment was used to determine sexual maturity, and the average of the scores for developmental stage and secondary sex characteristics was used in analysis. Sexual maturity ratings are recommended in order to interpret and control for differences among individuals in the maturational tempo not indicated in reference growth curves for BMI and triceps-skinfold thickness (170, 171). Gonadal hormones alter the rate of growth and the pattern of fat deposition during adolescence. According to Daniels et al., the stage of sexual maturation is a more important determinant of percent body fat than age. Therefore, percent body fat at a given BMI will differ depending on the level of sexual maturation. The negative regression coefficient for maturation stage indicates that there is a relatively lower body fat percentage in more sexually mature children of similar BMI. In addition, they found that for a similar BMI and maturation stage, boys have a lower percent body fat than girls and white subjects have a higher percent body fat than blacks for a given BMI after controlling for gender and maturation stage (170). The Tanner Stage is used as one of control variables in the present study in order to account for the difference in sexual growth among individuals. The relationship between BMI and body fatness in children and adolescents is dependent on maturation stage, race, gender, and waist-to-hip ratio.

CHAPTER V

STATISTICAL METHODOLOGY

1. Test of Assumptions for Regression Analysis

All statistical analysis used to examine the study hypotheses were performed using the SAS (Statistical Analysis System, version 9.0; SAS Institute Inc, Cary, NC, USA). It is often recommended to look at all the dependent variables and independent variables to determine their distribution; when variables are not normally distributed it is necessary to attempt to make those variables follow a normal distribution via a transformation (172). Normality for all continuous variables was assessed by several criteria including Shapiro-Wilk test, skewness test, and normal probability plots. The Shapiro-Wilk statistic is used to test the null hypothesis that the data are a random sample ($N \leq 2000$) from a normal distribution, and P value greater or equal to .10 was used as a cutoff. It was required to have skewness between the range of less than 0.8 and greater than - 0.8, but preferably in the range of $\pm$ 0.5. A theoretical normal distribution has the skewness value at zero. Also, normal probability was examined to confirm the distribution of a variable close enough to be normal visually. Once a variable appeared to be non-normal based on the above criteria, transformation of the variable was undertaken. Such transformations included taking the log, square or cube root, squaring or cubing the variable depending upon the direction and magnitude of the skew (172).

In order to detect multicollinearity problems among independent variables in regression equations, tolerance of each independent variable was examined. Variables were dropped from a regression model if tolerance of the variables was below .40. The heteroscedasticity test tests the assumption of constant variance by examining whether the squared standardized residuals are linearly related to a fitted value. Heteroscedasticity was detected through inspection of residual plots (residual versus predicted y plot).

2. Regression Diagnostics

Several diagnostics of regression model were used to indicate any observation's potential influence on the multiple regression model as a whole. Leverage scores, studentized residuals, DF-Fit scores (DFITS), and Cook's Distance statistic (Cook's D) are among the popular techniques of model diagnostics. The cutoffs for DFITS and Cook's D were 2 * square root of k/n (k=# of independent variables, n=sample size) and 4/n (n=sample size), respectively. DFITS was chosen to detect any observations that significantly influenced the regression model as a whole in this study.

Effects diagnostics are measures of the influence of each observation on the parameter estimates in the regression equation when an observation is deleted. DFBETAs are often used to indicate any effects of an observation for regression estimates. If DFBETA of i^{th} observation for k^{th} regression coefficient is 1, then it means the k^{th} regression coefficient estimate would increase by the amount of one standard error of the coefficient by excluding the i^{th} observation. A more conservative cutoff for

DFBETA is 2/sqrt (n), but the cutoff 1 is also used for the same purpose, although the latter cutoff is somewhat liberal (173). The cutoff value 1.0 was adopted in this study in an attempt to include as many observations as possible.

A final decision on dropping any observation from a regression equation was made if both model diagnostics and effect diagnostics suggested the evidence for the observation's significant influence.

3. Correlation Analysis

Variables and factors regarding each study concept were correlated to some extent. Correlation (r) measures the degree to which there is a linear relationship between two variables. That is, it measures the strength of the linear association between X and Y. Unlike the slope beta (regression coefficient estimate) in a regression, r treats the two variables symmetrically. The prediction equation using Y to predict X has the same correlation as the equation using X to predict Y. Correlation coefficient is a standardized version of the slope in a bivariate regression, and does not depend on the unit of a measurement. That is, the value of correlation coefficient is equal to the covariance computed using standard scores of two variables being analyzed (standard score= (observation –mean) / standard deviation)). Pearson's product moment correlation coefficient was calculated to identify relationships between parents-related variables, family meal-related variables, and children's health-related variables. Correlation analysis is identical with bivariate regression analysis. However, bivariate models in which a dependent variable is predicted by a single cause are less optimal than multivariate models because most social phenomena are often explained by multiple independent variables. Therefore, correlations between two variables that achieved sufficient statistical significance ($p \leq 0.05$) were then further tested using regression techniques. Due to the space limitations, the results of the correlation analyses are not reported in this study.

4. Regression Analysis

For dependent variables that are continuous (or integer), multiple regression technique was employed. Multiple regression analysis is one of the most useful of statistical techniques because it allows researchers to search for linear relationships between a dependent variable and a set of independent variables. Multiple regression technique is a straightforward extension of bivariate regression, and it offers the opportunity to explain a greater amount of variance in a given dependent variable. Tables developed for this dissertation for multiple regression analysis results consist of 7 columns: variables of concern (dependent variables), predictors (independent variables), beta (regression coefficients), standard beta (standardized regression coefficients), p value (statistical significance for t statistic of each regression estimate), F value (overall model fit) and adjusted R^2 (the coefficient of determination). Each of the unstandardized regression coefficients (beta) in multiple regression represents a partial slope or a partial regression coefficient. It indicates the average change in the dependent variable associated with a unit change in the corresponding independent variable with the other independent variable(s) held constant. In other words, the effect of an independent variable on the dependent variable in a regression model is separated from the effect(s) of the other independent variables on the dependent variable. A standardized beta is the estimate of the partial effect of an independent variable on dependent variable in standard deviation units. Therefore, it is interpreted in the following manner: if the standardized regression coefficient equals .43 for the relationship between the dependent variable and a given independent variable, this means for every one standard deviation change in the independent variable, there is a .43 standard deviation change in dependent variable, holding the effects of the remaining independent variables constant. One advantage of using standardized beta is that it allows us to compare relative effects of different independent variables on the dependent variable. The F-value associated with a regression model represents the overall model fit. R^2 represents proportion of ESS (explained variation of dependent variable by the regression model) relative to TSS (total variation of dependent variable). That is, the larger the ESS/TSS, the better the regression model is. Adjusted R^2 was used to obtain more of an unbiased estimate of the R^2 because R^2 is known to be slightly biased upwards with increases in the number of independent variables in the equation. Next, as was described in the previous section regarding regression diagnostics, all of the important diagnostics criteria such as normality, multicollinearity, homoscedesticity, and model fit, were applied for each regression model developed in the study (174-176).

When dependent variables were dichotomous (or dummy), OLS regression cannot be applied because OLS assumes normal errors and homoscedastisity, and OLS regression may also predict values of dependent variable that are negative or greater than

1. Logistic regression is the solution for models that contained dichotomous variables as dependent variables. An important concept regarding logistic regression is the “logit” which is created by taking the logarithm of the odds. Odds are the likelihood of a given event occurring in comparison to the likelihood of the same event not occurring and it ranges from 0 to infinity. The mean of this dichotomous Y variable (the event to be happened) is the proportion of times that it takes the value 1. In logistic regression, the logistic function ($P = e^{a+b1X1} / 1 + e^{a+b1X1}$) meets the needs of P (probabilities) to be ranged between 0 and 1. Strictly speaking, the dependent variable (Y) in the OLS has been replaced by the logit in the logistic regression. The logit is a linear function of X variables and the probability is a nonlinear S-shaped function. The Maximum Likelihood method is the general method of estimation in logistic regression. The likelihood function iteratively finds values for the intercept and regression estimate coefficients that maximize the probability of obtaining the observed set of data. In logistic regression, the LR chi square (likelihood ratio chi square), instead of F-test in OLS, is used to assess model fit. It is calculated by the following equation: -2 (log likelihood at iteration of 0 – log likelihood at final iteration), with df (# of parameters). If the chi square statistic exceeds the critical value at 0.05, it means that X variables help make a better prediction of P (probability) in the regression than without these X variables. If LR chi square is high enough, then one can reject the null hypothesis that all of the logits in the model are equal to zero. Another difference between OLS and Logit regression is that t-statistic is used in OLS to assess the significance of individual coefficients, whereas z-statistic is used for this purpose in logit regression. Unlike the

R^2 in the OLS regression, the Pseudo R^2 is used in logistic regression. However, pseudo R^2 does not measure the overall fit for the model in a straightforward manner. It should not be translated into the percentage of the explained variance, as in OLS. However, if Pseudo R^2 value is very low, this means the model prediction is a poor fit. Like OLS regression, tolerance was examined to detect multicollinearity problem among independent variables. In summary, tables of logistic regression results consists of 7 columns: variables of concern (dependent variable), predictors (independent variables), beta (logit coefficient estimate), standard beta (standardized logit estimate), p value (statistical significance of z statistic for beta), LR chi square (overall model fit), and Pseudo R^2 (a substitute for R^2 in OLS).

Finally, multivariate ordered logistic regression was used when dependent variables had ordered response categories. The ordered logistic regression model predicts the probability of an observation being in one of the categories as a linear prediction of X variables. One adopts the term “cumulative probability” in the logit regression. Suppose Y is an ordinal variable with c categories ($j<c$). Pr ($Y \leq j$) means the sum of the probabilities in category j and below. The final cumulative probability uses the entire scale. Therefore, Pr ($Y \leq c$) = 1. The linear function of the model coefficients for the X variables corresponds to the estimated cumulative probability of a certain response category. In multivariate ordered logistic regression, the coefficients and cut points (referred to as ancillary parameters) are estimated using maximum likelihood. These ancillary parameters are used to calculate probabilities for each observation’s being in each of the Y (dependent variable) categories, and also help interpret the logit

coefficients and their odds ratios. Each observation receives a score calculated from logit regression model. The score is a linear function of the b coefficients and their x (independent) variables. One can use the value of score for each observation along with the cut points to calculate the predicted probability score for an observation of being in the i^{th} response category (this is a cumulative probability, that is, if you add them up, they will equal to 1.00). The probability score is a linear function of the X variables and a set of cut points. However, the predicted probabilities are not linearly related to the X variables. If one has a Y variable with three categories, each observation will have three predicted probabilities, each representing the observation's probability of being in each of the three response categories. Importantly, a particular b coefficient takes the same value for the logit coefficient for each cumulative probability because the model assumes that the effect of X is the same for each cumulative probability. This cumulative logit model with common effects is called a "proportional odds." The proportional odds model addresses these cumulative logits simultaneously by assuming that the logit coefficients for x variables are the same regardless of the cumulative logit cutpoints. One can interpret the ordered logit coefficients with regard to the cut points, which define the outcome categories. Cutoff points are used along with the value of score for each observation to calculate the probabilities of being in each of the response categories. For a dependent variable consisting of three response categories, each coefficient refers to the linear change in the log odds of being above either of the first two categories of "none." holding all other X variables constant. A preferred interpretation of ordered logit coefficients is in terms of odds ratios (Ω) and percent change in the odds ratios ((Ω-1) × 100). To compare the relative effect of a given independent variable on the Y, one can standardize the logit coefficients or odds ratios (173, 177, 178).

In summary, a number of regression models were examined throughout the study since the study attempted to examine parental impacts on children's various health outcomes. Also, the same set of child's health outcome variables were studied in relation with family meal behaviors. This doubled the number of regression models tested. Finally, additional models were tested to examine if child's energy and nutrient intake and physical outcomes are better predicted by child's own eating behaviors or physical activity behaviors. It should be noted that 7 parenting behaviors (three styles and four style dimensions) variables were included in regression model separately due to multicollinearity problems. Likewise, two parental criticisms about child's eating (mother's criticism about child's eating and father's criticism about child's eating) were examined in separate modes with the same reason. All regression models were examined adjusting for general confounders, including parental socio-demographics and BMI, child's age, gender, activity level and maturity level, family income, and child's ethnicity. Overall models and the variables within those models were considered significant if the p-value was $\leq .05$. In the text of results section, each regression model is explained by descending order of variables in terms of magnitudes of standardized regression coefficients.

5. Factor Analysis

In survey research, it is common to ask multiple questions about a common concept to reduce measurement error because random error tends to cancel out across multiple measures. Factor analysis is generally used in "data reduction" in which variables used to measure an underlying concept are combined after being weighted. The variance of a set of variables can be broken down into three components: common, specific, and error variance. Specific variance is variance specific to a particular variable that is not shared with other variables in the correlation matrix. Error variance means errors of measurement, and the impact of measurement error on variables is evaluated by assessing the internal consistency of a set of variables using Cronbach's coefficient alpha. The more reliable the set of variables, the higher the internal consistency (also called reliability), the lower are the errors of measurement ($1-\alpha^2$). Common variance (also called communality) is that variance shared among variables and is the major focus of interest in factor analysis. Principal Component Analysis (PCA) and Common Factor Analysis (CFA) are the two of the most frequently used methods of conducting factor analysis. Although PCA has many strengths such as its straightforwardness and ease of understanding, it has a significant drawback in that PCA does not separate out errors of measurement from shared variance. That is, PCA assumes that variance among variables can be totally explained by the components extracted. This is reflected in that all of initial communalities (common variance) in PCA are 1. In contrast, Common Factor Analysis (CFA) begins with the assumption that the variance in a given variable can be explained by a small number of underlying common factors and by variance that is unique to the variable. So factors in CFA are not completely defined as linear combinations of variables but are instead hypothetically generated from common variance, not total variance. Communalities of variable placed on the diagonal of the correlation matrix are less than 1 because correlation matrix can not be perfectly created due to unique variance associated with each variable. Thus, variance is shared in common between variables and factors. In CFA, prior communality estimate in the correlation matrix is the square of the multiple correlation coefficients (R^2) resulting from the regression of each variable on all other variables in the matrix. Unlike PCA, eigenvalues in CFA are not estimates of total variance but are estimates of the amount of common variance among the variables that is explained by the particular common factor. The larger the eigenvalue, the more total common variance is explained by that factor. Given the advantages of CFA over PCA, CFA was chosen for the present study.

Factor analysis (CFA) was performed to create factors representing underlying variables for this study's major concepts. Thus, questions about parenting style, family meal behaviors, and self-concept (self-concept is the way this word ought to be used) were subject to factor analysis. The first step of the factor analysis began with all the relevant variables associated with an underlying variable. The step that followed involved removal of any variable with an inadequate MSA coefficient (i.e., less than .60). After removing such variables, a second factor analysis was run. This process was repeated until the result obtained contained only those variables with an acceptable MSA value. The MSA for an individual variable indicates how strongly that variable is correlated with other items in the matrix. Next, several criteria for final determination of factors were applied and these included eigenvalues, cumulative percentage of variance, and the scree plot. An eigenvalue represents the amount of variance in all of the variables that can be explained by a given factor. The scree plot plots the extracted factors against their eigenvalues in descending order of magnitude in order to identify distinct breaks in the slope of the plot; however, determining the point where discontinuity of the eigenvalues occurs is often very subjective. One problem with respect to factor analysis in the study was that factors drawn from factor analysis were not readily interpretable conceptually, even though several important criteria relevant for extracting factors were met. Such a result is not unusual in the application of factor analysis. This complexity led to a slight modification of factor analysis method that a group of questions intended to explain a common concept were underwent factor analysis separately and followed by another factor analysis with a group of questions aiming another common concept. In general, rotation technique (varimax or promax) is applied for multiple factors to make the interpretation of factors easier. However, most of the factors in the present study were not subject to rotation because single factor solution was most of the case. Rotation is not possible when only one factor is present. In order to ascertain whether individual variables in a factor are actually measuring the common concept, a certain level of correlations between individual variables in that factor should be obtained. A minimum factor loading of .40 or greater was used as the cutoff for determining whether a variable contributed significantly to a given factor (there were a few exceptional cases in which a cutoff of slightly lower than .40 was used); in addition, those variables that achieved thus cutoff were then assessed using Cronbach's alpha coefficient (the minimal standard is greater than or equal to .60, preferably greater than or equal to .65 in order to be accepted as a factor variable in the present study) (179, 180). As was discussed previously, the Cronbach's alpha value represents the proportion of total variance in a given factor that can be attributed to a common source. Therefore, the Cronbach's alpha can be used to measure the reliability of factor extracted by factor analysis. As reflected in the formula for the Cronbach's coefficient alpha, not only the size of correlations among the variables that load on a given factor, but also the number of variables in the factor affect the size of coefficient alpha. Decisions were made to delete variable(s) from a factor if value of coefficient alpha for the factor turned out to be higher with deleting the variable(s) from the factor compared with the coefficient alpha with including the variable(s). In other words, certain variable(s) were deleted in order to improve reliability of a given factor.

6. Cluster Analysis

The purpose of cluster analysis is to place observations (or variables) into groups or clusters suggested by the data, not defined a priori, such that observations in a given cluster tend to be similar to each other in some sense, and observations in different clusters tend to be dissimilar. A vast number of clustering methods have been developed in several different fields, with different definitions of clusters and similarity among observations, thus any generalization about cluster analysis is difficult. A variety of terms are used for cluster analysis may reflect the complexity of the analysis.

Classification, typology, taxonomy, and partitioning are among those terms (181). Clustering techniques may be categorized into five groups: hierarchical agglomerative, hierarchical divisive, iterative partitioning, density search, and factor analysis variants; each of these techniques represents a different perspective on the criterion of groups. The hierarchical agglomerative method is the most frequently used type of clustering. This method begins with each observation defined as a cluster, and these clusters are combined on the basis of their similarity until all observations are grouped into one cluster. These clusters are non-overlapping, which mean that each observation can be a member of only one cluster of the same rank or level. The clusters, however, are nested as a member of a larger, more inclusive cluster at a higher rank. Drawing a tree diagram (called a dendrogram) is the most familiar expression of the results of these hierarchical clustering methods, and the dendrogram is a graphical display of the hierarchical structure implied by the similarity matrix and clustered by a certain linkage rule. Hierarchical agglomerative methods are distinguished primarily by their different linkage rules for the formation of clusters. The SAS program (version 9.00) provides eleven linkage methods. Single linkage, complete linkage, average linkage, and Ward's method are among the most popular methods. In single linkage, two clusters are merged if there is at least one entity from each cluster which achieves a given level of similarity with each other. Thus, a cluster is defined as a group of entities such that every member of the cluster is more similar to at least one member of the same cluster than it is to any member of another cluster. Single linkage is one of the few methods that will not be affected by any data transformation that retains the same relative ordering of values in the similarity matrix. The major drawback of single linkage is the tendency of having chain, i.e., to form a large, elongated cluster that adds new observations to itself one by one as the agglomerative process proceeds. Thus, this cluster method is rarely helpful when one needs to deal with a large data set (N>100). Complete linkage is the logical opposite of single linkage clustering, and it is more rigorous. The rule of complete linkage clustering is that when two clusters merge, all members of both clusters must achieve a certain high level of similarity with each other. In clusters produced by complete linkage, each member is more similar to all members of the same cluster than it is to all members of any other cluster. Unlike single linkage, this method shows no tendency to form chains. Average linkage is developed as an antidote to the extremes of both single and complete linkage. This method computes the arithmetic average of the similarities between all entities in one cluster with all entities in the second cluster, subsequently, joins the clusters if a given level of similarity is achieved using this average value. Thus, each member of a cluster has a greater mean similarity with all members of the same cluster than it does with all members of any other cluster. Ward’s method was developed to optimize the minimum variance within clusters. This method joins those clusters that result in the minimum increase in the ESS (the error sum of squares). According to this method, a cluster is defined as a group of entities in which the variance among the members is relatively small. The Ward method tends to find clusters of relatively equal sizes. This method has been widely used in many of the social sciences.

Iterative partitioning methods, especially the subset known as the k-means methods, are the methods that optimize the ESS criterion of Ward's method. Partitioning methods work by the following steps; 1) begin with an initial partition of the data set into some specified number of clusters based on the computation of centroids of these clusters, 2) allocate each data point to the cluster that has the nearest centroid, 3) compute the new centroids of the clusters, and clusters are not updated until there has been a complete pass through the data, 4) alternate steps 2 and 3 until no data points change clusters. These methods produce single-rank clusters that are not nested, and therefore are not part of a hierarchy. The major advantages of iterative partitioning methods include requirement of relatively short amount of computation time and storage space, appropriateness for distinctly larger data sets, and compensation for a poor initial partition of the data which is the major drawbacks of hierarchical agglomerative methods because the iterative methods make more than one pass through the data.

Hierarchical divisive methods are the logical opposite of an agglomerative one. Divisive methods start with all entities belonging to one cluster, and this cluster is cut into successively small chunks. Density search methods interpret a cluster as a region of a high density of points in a space relative to those regions surrounding it. Factor analysis variants are clustering methods that form an N * N correlation matrix among the entities, and factors are extracted from the correlation matrix. Each factor is now interpreted as a cluster and the observations belonging to that cluster are those observations with high correlations to that factor (182). Detailed discussions for the above three methods are not included because they are beyond the scope of the present study.

The SAS software is oriented toward disjoint or hierarchical clustering methods. In this study, “fastclus” and “cluster” procedures were used to place study subjects (children, adolescents, males, and females) into different clusters based on their perception of mother’s versus father’s general parenting behaviors. First, the “fastclus” procedure (iterative partitioning) finds disjoint clusters of observations using k-means method applied to coordinate data. According to suggestions made by the SAS/STAT guide (181), one may want to use ‘fastclus’ procedure if the researcher wants to hierarchically cluster a data set that is too large to use with ‘cluster’ procedure directly, then ‘fastclus’ procedure can be used to cluster observations roughly before the use of ‘cluster’ procedure. Next, the ‘cluster’ procedure (hierarchical agglomerative) performs hierarchical clustering of observations using one of eleven agglomerative methods applied to coordinate data or distance data. The investigator examined all eleven methods to determine which method was most appropriate for the study data. Finally, the Ward’s method was chosen because it was easy to use and the clustering results by this method provided greater interpretability, compared with clusters created from the other methods. In summary, decisions made regarding cluster analysis plan for the study data are as follows: first of all, some of the variables were transformed**,** because these variables in the data set did not have equal variances, and standardize the variables to mean zero and variance one is one of the transformation methods suggested. Next, “fastclus” procedure was applied with requesting 5 initial clusters by k-means method.

After this was done, the initial clusters were further analyzed by 'cluster' procedure with using Ward's method. Once a 'cluster' step was completed, then the output from 'cluster' procedure was transferred into a tree diagram. One of the challenges in interpreting the results of cluster analysis is how to determine the most reasonable number of clusters in a data set. Researchers often find resolutions to the number of clusters problems by examining visually the hierarchical tree diagram if the clustering method chosen is belonged to the category of hierarchical agglomerative method. From the analysis of the tree diagram, the researcher decides how many "branches" appear and assumes that each major branch of the tree diagram is associated with a particular cluster in the data (183). Another commonly used procedure to decide on the number of clusters in a data set is to analyze the "amalgamation coefficients". These coefficients are the values at which various observations merge to form clusters. These coefficients can be visually searched for values at which there are sudden "jumps" in the value. A jump implies that two relatively dissimilar clusters have been merged, thus the number of clusters prior to the jump is the most reasonable estimate of the number of clusters (184). Thus, these two methods were adopted in order to determine number of clusters in the study. Figures of cluster analysis (i.e., clustering history) in this study that transferred from SAS output consist of 7 columns: NCL (number of cluster), Clusters Joined, FREQ (number of observations in the new cluster), SPRSQ (semipartical R^2, this represents the decrease in the proportion of variance accounted for by joining the two clusters), RSQ (R^2, this means the proportion of variance accounted for by the clusters), PSF (pseudo F, this value is often used to judge the number of clusters in a data set and relatively large values indicate a stopping point), and PST^2 (pseudo t^2, this is another useful value to determine final number of clusters. Generally, one finds final number of cluster by moving down the pseudo t^2 column until the first value markedly larger than the previous value and then moving back up the column by one cluster) (181).

Although the analysis of the tree diagrams and the search across amalgamation coefficients for jump points are subjective procedures, and thus they were subject to potential bias by the researcher's preconceived notions of how many clusters exist in a data set. In order to obtain a validity of cluster analysis protocol used for this study, the analysis plans and results of cluster analysis were consulted and the protocol was approved by an expert who is familiar with cluster analysis methodology based on his own experiences at Department of Educational Psychology at Texas A & M (185).

7. Path Analysis

One of the main purposes of multiple regression is "prediction"; in addition, it also provides explanations of cause-and-effect relationships among a set of variables (175). Path analysis was developed in order to test possible causal relationships among such variables. The investigators first specify a causal model for a set of variables based on theory and/or previous research (path diagram). A causal model is often presented in the form of path diagram, by which variables are connected with arrows in a causal flow. The arrows represent direct relationships among variables and provide the researcher with guidance as to the regression models that must be run. The outcome of the regression analysis provides the researcher with evidence regarding the validity of these hypotheses. Path coefficients for direct causal effect are provided by regression analysis in the form of standardized regression coefficients. Thus, the interpretation of path coefficient is similar to that for multiple regression: estimated change in the standard deviation units of DV, associated with a one standard deviation change in each IV, holding other IVs constant. In addition, path analysis has a substantial advantage in that indirect causal effects can be estimated by path models. An indirect effect occurs when a variable affects a dependent variable through its effect on some other variable, known as an intervening variable (175, 176, 186, 187). According to Baron and Kenny's discussion, both "mediator" and "moderator" terms indicate variables that intervene between other variables, but these terms need to be distinguished conceptually. The term "mediator" is appropriate to be used in a causal modeling for the variables that connect independent and dependent variables (188). The value of an indirect path coefficient is determined by finding the product of all path coefficients in the chain linking these variables. In a simpler path model such as the three variable case, path coefficients for indirect effects are calculated (in the three variable case) by multiplying the path coefficient that link a given independent variable to a mediator times the coefficient linking the mediator and the dependent or outcome variable. Various formulas have been developed to test statistical significance of intervening variable effects. Sobel's formula has been most commonly used; it tests the significance of indirect effect by dividing the estimate of the intervening effect by its standard error and comparing this value to a standard normal distribution. In order to accommodate the formula, unstandardized regression coefficients and its' standard errors were used to calculate the Z statistic (189). Finally, direct and indirect path coefficients were summed to calculate total path coefficients when both direct and indirect effect turned out to be statistically significant at P value ≤ .05 (175, 186).

It needs to be stated that dichotomous variables that were used in multiple regression analyses were not allowed in path models based on the assumptions and rules with respect to path analysis. The main problem is that the standardized regression coefficient that are used to represent the magnitude of effects in a path model do not have the same meaning for nominal variables as they do for interval-level variables in regression. Instead the coefficient for the dummy variable represents the difference between the mean response in the dependent variable when the dummy variable=1 and the mean response when the dummy variable =0 (190).

The following is a brief summary of how path models were applied to the present study. Multiple regression analysis provided some evidence for possible causal relationships between parenting behaviors and child's health outcomes with or without mediation of family meal behaviors based on the following reasoning: first, variation in the parenting style dimensions significantly accounted for variation in the family meal behaviors, second, variation in family meal behaviors significantly accounted for variation in the child's health outcomes (self-concept, eating behaviors, and physical activity behaviors), and third, the relationships between parenting behaviors and child's health outcomes were reduced after controlling for family meal behaviors. A proposed path model for the relationships among parenting style dimensions, family meal behaviors, and child's health outcomes is seen below (Figure 5-1).

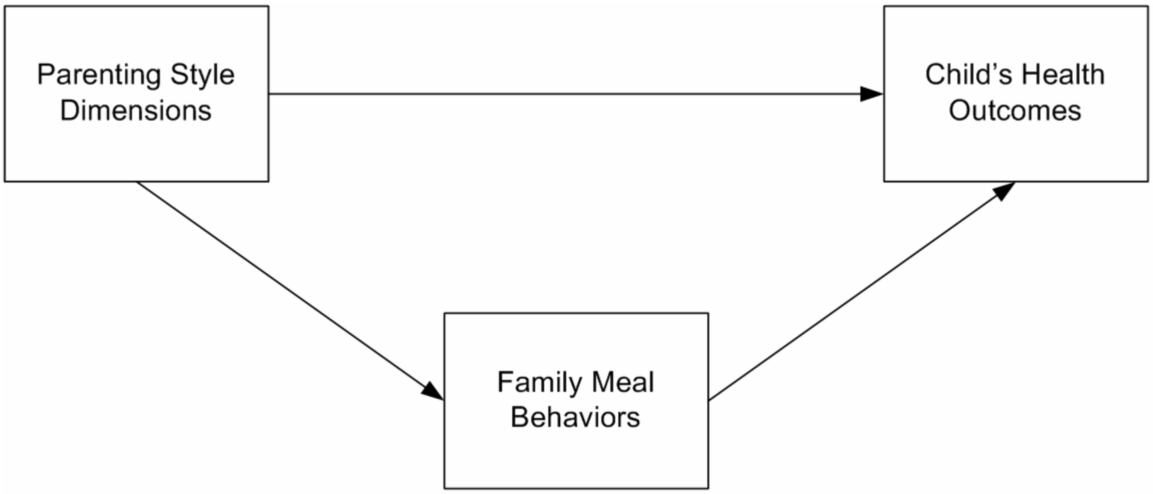

Figure 5-1. Path model for the relationships among parenting style dimensions, family meal behaviors, and child's health outcomes

CHAPTER VI

STUDY VARIABLES AND DESCRIPTIVE STATISTICS

1. Creating Parenting Style Variables

The study subjects were classified based on their perception of parenting style. Initially, factor analysis was applied to derive pertinent parenting dimensions using the 35 parenting-related questions from the questionnaire. However, the resulting factors were not conceptually interpretable. Therefore, a decision was made to group the questions that were originally intended to index certain dimensions of parenting. Eleven parenting style dimensions were created by grouping the 35 items from the questionnaire that represented parenting that represented one of these dimensions (54, for a similar approach). The summed and averaged values for the pertaining questions were used as final scores for each parenting dimension. The parenting style dimensions used for cluster analysis include care, clear behavioral regulation, help, maturity expectations, lack of punishment, high achievement expectations, immaturity expectations, psychological punishment, punishment by withholding privileges, harsh punishment, and praise. Mother's parenting style and father's parenting style were analyzed in separate models. The original questions that were combined to create each of the maternal/paternal parenting style dimension variables are shown in Table 6-1 (see Appendix A). The variable 'praise' was the only variable that did not load significantly on any factor and consisted of a single question: my mother/father gives me praise, encouragement, or approval.

Examination of dendrogram results and amalgamation coefficients for jump points suggested two clusters are the most reasonable solution for both mother's and father's parenting styles in children and adolescents. The same cluster analysis methods were used for the analysis of male and female subjects as well. Again, a two clustering decision seemed to be reasonable for maternal and paternal parenting styles perceived by male and female subjects. In summary, parenting styles identified in the data set included two mother styles and two father styles for children and adolescents, as well as two maternal and two paternal parenting styles for male versus female subjects. Figures 6-1 to 6-8 and Tables 6-2 to 6-9 show the results of cluster analyses that suggested the decision of two clusters for each group's maternal versus paternal parenting styles (see Appendix A). It needs to be noted that the variables with respect to decision making process were excluded from the cluster analysis. Unlike other parenting style items, those decision making variables were coded as dichotomous. It appeared that inclusion of those dichotomous variables made the interpretation of resulting clusters more complicated than when they were not included. Accordingly, a decision was made to exclude those three decision-making variables at the stage of cluster analysis, however, distribution of three decision making types, along with other parenting dimensions, was examined across the different parenting styles.

2. Parenting Styles and Their Dimensions Perceived by Children and Adolescents

For children's perceived maternal/paternal parenting styles, Table 6-10 shows the two clusters for both maternal and paternal parenting styles (see Appendix B for Tables 6-10 to 6-17). With respect to maternal parenting style, the first cluster (seen in the left-hand column) indicated higher group means for care, clear behavioral regulation, helps, maturity expectations, lack of punishment, high achievement expectations, praise, parent-child shared decision making, and child-alone decision making, compared with the mean values for the second cluster (seen at the right-hand column). Accordingly, the second cluster had higher group means for immaturity expectations, psychological punishment, punishment by withholding privileges, harsh punishment, and parent-alone decision making. The first cluster was named as mother's authoritative style (MA), and the second cluster was named as mother's non-authoritative style (MNA) based on general parenting style theories and other studies. For paternal parenting styles in children, the first cluster was named to be father's authoritative style (FA) that exhibited higher scores with respect to care, clear behavioral regulation, help, maturity expectations, lack of punishment, high achievement expectations, immaturity expectations, praise, parent-child shared decision making, and child-alone decision making. The second cluster was named as father's non-authoritative style (FNA) based on the higher group mean scores for psychological punishment, punishment by withholding privileges, harsh punishment, and parent-alone decision making. Next, an additional grouping method was applied to the subjects. A cluster of children who perceived both mother and father as authoritative parents was named as both parents' authoritative style (BA), and the other cluster was named as "at least one parent's non-authoritative style (OPNA)" (Table 6-11). Logically, OPNA includes three types of mixed parenting styles; mother's authoritative-father's non-authoritative, mother's non-authoritative - father's authoritative, and both parents' non-authoritative style. Examination of the two clusters based on both parents' authoritativeness may provide some insights into whether both parents' authoritativeness can affect separate examination on children's perception of maternal and paternal parenting style. It needs to be mentioned that comparison of mothers' parenting behaviors between mothers in BA versus MA families may help determine whether children perceived their mothers differently for two different conditions: the first is both mother and her spouse used authoritative style, and the second is mother was authoritative, but her spouse's was not necessary. It was expected a significant correlation might exist between perceived mother's/father's parenting behaviors. It was shown that children perceived authoritative mothers in the same way regardless of their father's authoritativeness**,** given there was no difference in magnitude of means for mother's parenting style dimensions between MA and BA (Table 6-10 and 6-11). In a comparison of paternal parenting behaviors between FA and BA, children who were raised by authoritative fathers, regardless of mother's authoritativeness, perceived their fathers exercised greater control (Table 6-10), whereas children whose parents were both authoritative perceived their fathers as utilizing lower control (Table 6-11). This implies that authoritative fathers are less likely to use greater control over their children when their wives adopt authoritative parenting style. In addition, mothers and fathers who belonged to the BA cluster appeared to use similar parenting style for their children given that parenting style dimensions that had higher values for mother's style dimensions also had higher values for father's style dimensions.

Table 6-12 shows means of parenting style dimensions based on adolescents' perception of maternal/paternal parenting behaviors. The naming strategies used in the children's group were also applied to adolescents' parenting style classification. Consequently, MA exhibited higher care, clear behavioral regulation, help, maturity expectations, lack of punishment, praise, parent-child shared decision making, and child-alone decision making, whereas MNA had higher level of achievement expectations, immaturity expectations, psychological punishment, punishment by withholding privileges, harsh punishment, and parent-alone decision making. When father's parenting style is not considered, adolescents' perception of mother's parenting styles (MA and MNA) seemed to be very similar to those identified in children, but that adolescents from authoritative mothers perceived mother's lower achievement expectations, whereas children whose mothers used authoritative style perceived their mothers had higher achievement expectations of them. This suggests that authoritative mothers adjust their parenting skills by the course of child's growth such as adolescents' striving for individuation, regardless of father's authoritativeness. For adolescents' perceptions of paternal parenting style, the first cluster was associated with a higher level of care, clear behavioral regulation, help, maturity expectations, lack of punishment, achievement expectations, immaturity expectations, praise, parent-child shared decision making, and child-alone decision making; therefore this cluster was named to be FA. The second cluster was named as FNA because it was associated with greater psychological punishment, punishment by withholding privileges, harsh punishment, and parent-alone decision making. It was remarkable that a relatively small number of adolescents (14%) perceived their fathers to be non-authoritative. Again, cross classification of MA and FA produced four parenting styles in terms of adolescents' perception of both parents' style. Two clusters were named to be BA and OPNA (Table 6-13). Adolescents perceived authoritative mothers' parenting style dimensions in the same way regardless of their father's authoritativeness, given that the pattern of mother's parenting style dimensions were consistent across MA (father's style is either authoritative or non-authoritative) and BA (father's style is authoritative) categories (Table 6-12 and 6-13). Likewise, adolescents perceived similar level of authoritative father's style regardless of mother's authoritativeness**,** given that same pattern of father's parenting style dimensions were detected between FA (mother's style is either authoritative or non-authoritative) and BA (mother's style is authoritative). In addition, comparison of the MA style and FA style in the BA cluster provided some insights into a question of whether authoritative mothers and authoritative fathers treat their adolescents differently. Table 6-13 shows that both authoritative mothers and fathers used higher levels of care, clear behavioral regulation, help, maturity expectations, praise, lack of punishment, parent-child shared decision making, child-alone decision making, lower level of psychological punishments, punished by withholding privileges, harsh punishment, and parent-alone decision making (mom or dad) for their adolescents.

However, authoritative fathers had higher achievement expectations and used control, whereas authoritative mothers had lower achievement expectations and used control for their adolescents. This implies that authoritative fathers tend to be harder on their adolescent children than authoritative mothers do by adopting higher level of control and exertion of behavioral expectations.

It needs to be mentioned that perhaps an unbiased examination on how parents parent their children and adolescents differently may be problematic in the scope of present study because only one child/adolescent from each household participated in the study. However, it is still meaningful to compare the patterns of MA and FA in the BA cluster between children and adolescents because only authoritative parenting style is taken into consideration, controlling for the other gender parents' parenting style. Authoritative mothers were characterized by their use of a greater level of care, clear behavioral regulation, help, maturity expectations, praise, lack of punishment, parent-child shared decision making, and child-alone decision making for both children and adolescents. However, authoritative mothers appeared to exert higher achievement expectations for children, but not for adolescents. Authoritative fathers used greater care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, high achievement expectations, parent-child shared decision making, and child-alone decision making, and fewer psychological punishments, withholding privileges as punishment, harsh punishment, and parent decision making (mom or dad) for both children and adolescents. However, authoritative fathers used greater immaturity expectations for adolescents and less immaturity expectations for children. This implies that authoritative fathers tend to maintain higher level of behavioral expectation for both children and adolescents, whereas authoritative mothers tend to exhibit lower level of achievement expectations when their children grow into adolescence. Authoritative mothers consistently used a lower level of immaturity expectations for older children and young adolescents, whereas authoritative fathers tended to use a higher level of immaturity expectations for their adolescents. This suggests that fathers might tend to use greater control in an attempt to make up for mothers' lowered achievement expectations for their young adolescents in authoritative homes.

3. Parenting Styles and Their Dimensions Perceived by Male and Female Subjects

Previously, gender differences in view of parental effect were briefly discussed. The next several paragraphs report the results of the cluster analysis for male and female subjects' perceived parenting styles. Tables 6-14 through 6-17 (see Appendix B) demonstrate group means for each parenting style dimension for maternal and paternal parenting styles in male and female subjects, respectively. Since a detailed explanation was provided for naming clusters in children and adolescent section, only a brief summary is provided for male and female subjects' parenting styles. For males, the first cluster was named MA because it was associated with higher level of care, clear behavioral regulation, help, maturity expectations, lack of punishment, achievement expectations, immaturity expectations, praise, parent-child shared decision making, and child-alone decision making, and a lower level of psychological punishments, punishment by withholding privileges, harsh punishment, and parent-alone decision making, compared with the second cluster. The second cluster was named as MNA. It is apparent that authoritative mothers tended to have higher achievement expectations and use immaturity expectations along with higher level of nurturing-related parenting practices for their male children (Table 6-14). For male subjects' father's parenting style, the FA cluster was associated with a higher level of care, clear behavioral regulation, help, maturity expectations, lack of punishment, high achievement expectations, control, psychological punishment, punishment by withholding privileges, praise, parent-child shared decision making, and child-alone decision making, but a lower level of harsh punishment and parent-alone decision making with respect to father's parenting style, compared with the second cluster FNA. It needs to be pointed out that when authoritative fathers used their parenting skills on male children, the fathers tended to use a higher level of immaturity expectations and several types of punishments, but not harsh punishment. In order to examine any differences between perceived maternal and paternal parenting behaviors by male subjects, the subjects were divided into four groups by cross classification of MA and FA. As with the previous discussion, BA and OPNA clusters resulted from cross classification of MA and FA (Table 6-15). Males from BA families experienced higher care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, high achievement expectations, immaturity expectations, punishment by withholding privileges, parent-child shared decision making, and child-alone decision making, and lower level of psychological punishment, harsh punishment, and parent (mom/dad) decision making for both parents, compared with OPNA (Table 6-15).

Comparison between BA and MA versus BA and FA groupings provided some insights into how male subjects perceived their mothers and fathers differently when one parent's authoritative style is coupled with the other parent's authoritative style or the other parent's authoritativeness is not certain (Table 6-14 and 6-15). Examination of mother's parenting style dimensions between MA and BA revealed one difference, that is, authoritative mother used higher level of punishment by withholding privileges when their spouses adopted an authoritative parenting style (BA), whereas authoritative mothers whose spouses used either FA or FNA were less likely to punish their male children by withholding privileges. This suggests that authoritative mothers tended to use authoritative punishment (withholding privileges) more often when their spouses were also authoritative. Authoritative fathers used a lower level of psychological punishment when those fathers were coupled with authoritative spouses, whereas authoritative fathers used a higher level of psychological punishment if their spouses adopted either MA or MNA. These findings imply that the level of punishment adopted by mothers or fathers may be affected by their spouses' authoritativeness, given that authoritative mothers punished their sons more frequently by withholding privileges, and authoritative fathers less frequently used psychological punishment toward their sons when their spouses were also authoritative. In addition, an examination of mothers' and fathers' parenting style dimensions in the BA cluster suggests that authoritative mothers and authoritative fathers treated their male children very similarly, given they had same patterns of parenting style dimensions. It is apparent that both authoritative mothers and fathers tended to use higher achievement expectations, immaturity expectations, and punishment by withholding privileges (Table 6-14 and 6-15).

Table 6-16 shows group means of maternal/paternal parenting style dimensions in female subjects. For maternal parenting behaviors, the first cluster, MA, was associated with higher levels of care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, parent-child shared decision making, and child-alone decision making for their mother's parenting style. The second cluster, MNA, was characterized by higher achievement expectations, immaturity expectations, psychological punishment, punishment by withholding privileges, harsh punishment, and parent-alone decision making. For females' perceptions of paternal parenting style, the first cluster FA was associated with higher care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, achievement expectations, and parent-child shared decision making. The second cluster FNA was associated with higher levels of immaturity expectations, psychological punishment, punishment by withholding privileges, harsh punishment, parent-alone decision making, and child-alone decision making. Next, females were classified into two groups based on how they perceived both parents' parenting style. Again, BA and OPNA were the resulting clusters (Table 6-17). Characteristics of parenting style dimensions in BA indicated higher levels of care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, parent-child shared decision making, and child-alone decision making for both parents, and high achievement expectations for fathers, lower levels of immaturity expectations, psychological punishment, punishment by withholding privileges, harsh punishment, and parent-alone decision making for both parents. Like the examination for the male group, comparison of BA versus MA and BA versus FA was conducted to determine whether female subjects perceived their mothers and fathers differently in terms of different combinations of maternal/paternal styles. It appears that authoritative mothers and fathers used the same pattern of parenting style regardless of their spouses' authoritativeness, given no difference in the patterns of mothers' parenting style dimensions between MA and BA and no difference in father's parenting style pattern between FA and BA. In addition, examination of mother and father's parenting style dimensions in the BA cluster suggests that authoritative mothers and authoritative fathers treat their female children slightly differently, given that authoritative mothers held a lower level of achievement expectations, whereas authoritative fathers tended to hold higher achievement expectations of their female children, while other parenting style dimensions were in the same pattern between mothers and fathers (Tables 6-16 and 6-17).

While parenting style theories have been useful in classifying mother/fathers based on the parenting style they adopt for their children, it must not be overlooked that different parents may use different parenting styles under the unique environment of each household, and the family environment may be experienced differently by people within the same family, thus children and adolescents as well as male and female children may perceive their mother and father's parenting behaviors differently. This increases the need to examine differences in perceived parenting by two or more children from the same family (and these should vary by age or by gender) because it may provide greater insight into whether parents treat their children differently, depending on age and gender. However, an alternative is to compare the patterns of MA and FA in BA cluster of male and female subjects in order to detect any similarities and dissimilarities regarding how parents (mothers/fathers) parent their children (boys/girls). One benefit of using the BA cluster may be that only parents' authoritative style is taken into account, controlling whether the spouses' parenting style is authoritative or not. The findings from examination of the BA cluster include authoritative mothers being characterized as using greater care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, parent-child shared decision making, and child-alone decision making for both male and female subjects. Authoritative mothers appeared to exert higher achievement expectations, immaturity expectations, and punishment by withholding privileges for male children, but not for female children. Likewise, authoritative fathers used more immaturity expectations and punishments when dealing with male children. Authoritative fathers used greater care, praise, clear behavioral regulation, help, maturity expectations, lack of punishment, high achievement expectations, parent-child shared decision making, and child-alone decision making, but fewer psychological punishments, punishment by withholding privileges, harsh punishment, and parent-alone decision making for both male and female children. Authoritative fathers used greater immaturity expectations and punishment by withholding privileges for male children only. These finding revealed some similarities between maternal and paternal parenting behaviors, given that both mothers and fathers tended use a greater amount of control and punishments in dealing with their male children, but not their female children.

4. Factors Extracted for the Study

Eleven parenting style dimension variables, 11 family meal behaviors, 11 self-concept variables, and 11 mother's/father's work-related stress variables were subjected to separate common factor analysis. Due to the difficulty of interpreting factors drawn from common factor analysis when all the relevant variables were included in factor analysis, a decision was made to include only pertinent questions that seemed to conceptually support a certain measure of parenting style dimension and that had high enough loadings on the factor in question. For example, the factor analysis technique was used to derive a single factor using only pertinent questions that conceptually supported a parenting style dimension, instead of deriving multiple factors from all 35 questions regarding parenting. Consequently, factor rotation was not necessary when a single factor was extracted through common factor analysis. As was discussed in the statistical methodology section, only those variables that obtained a minimum factor loading of .40 or greater (with a few exceptional cases having factor loadings slightly lower than .40) retained in a factor and the extracted factors were assessed its internal consistency (so called reliability) using Cronbach's alpha coefficient cutoff greater than or equal to .60 (177). Table 6-18 through 6-22 summarized original questions representing corresponding factor variables along with their factor loading values and Cronbach's alpha for each extracted factor regarding children's perceived maternal/paternal parenting style dimensions, family meal behaviors, self-concept, and mother's/father's work-related stresses, respectively. Tables 6-23 to 6-27, tables 6-28 to 6-32, and tables 6-33 to 6-37 summarized the factors created for adolescents, males, and females, respectively (see Appendix C). Some explanation is needed as to how the variable "self perception of overweight" was created. To create the difference between the child's actual body weight and the body weight a child thinks that he (she) should weigh, the following formula was used: (1 – (measured body weight /body weight that I think I should weigh)) * 100. Values of this variable were thus expressed as a percentage. For example, value 30 means that a child's measured weight is 30 % greater than the weight he (she) thinks it should be. A similar indicator was created for the difference between body weight reported by the child (obtained during the interviewer) and the amount that child thinks he (she) should weigh. This variable was created in an attempt to measure child's self awareness of overweight in a slightly different way. The larger the value for this variable, the more a child thought he (or she) should weigh less than what he/she perceives his/her weight to be. Therefore, these variables may represent the degree to which a child perceives himself (or herself) to be overweight as does an additional question "Do you think you are (very think, slightly thin, about average, slightly overweight, very overweight)?" Common factor analysis confirmed that these three variables were sufficiently related in order to produce an acceptable factor.

5. Final Study Variables

Table 6-38 shows list of questions and their corresponding study variables regarding family meal behaviors, self-concept, eating behaviors, physical activity behaviors, and maternal/paternal work-related stress; factor variables were created using multiple questions and non-factor variables are matched with their original single questions adopted from the survey questionnaire (see Appendix D for Tables 6-38 to 6-48). The variable “self esteem” was created by adopting Rosenberg’s Self-esteem Scale (158). Rosenberg’s Self-esteem Scale was initially intended for use with adolescents, but it also has been used with children and as well as adults. It is known that internal consistency was high (correlation’s in the high .80s and .90s), and test-retest correlations over several week periods were in the .80s. With regard to validity, Rosenberg demonstrated that self-esteem correlated well with other psychological and clinically relevant constructs such as depression (26). The scale consisted of ten items with four response categories (strongly agree, agree, disagree, strongly disagree) and some of the questions were reverse coded so that high scores on each item reflected greater self-esteem: “I feel I‘m as good as a person as others are”, “I feel that I have a number of good qualities”, “All in all, I feel like that I am a failure”, “I am able to do things as well as most other people”, “I feel I do not have much to be proud of”, “I feel positive about myself”, “On the whole, I am satisfied with myself”, “I wish I could have more respect for myself”, “I feel useless at times”, and “Sometimes I think I am no good at all”. Following convention, scores for each item were summed and averaged in order to assign an overall self-esteem score for an individual. Each of the three dummy variables regarding decision making between a parent and a child were created by using following questions. For shared decision making by parents and children, a child's shared decision making was assigned the value '1' if he (or she) answered either "I have considerable opportunity to make my own decisions, but she (my mother) has the final word", or "my opinions are as important as my mother's (step-mother's) in deciding what I should do", otherwise the variable was coded '0'. The variable child's parent-alone decision making was coded as '1' if he (or she) answered either "my mother (step-mother) just tells me what to do", or "she listens to me, but makes the decision herself", otherwise the variable was coded as '0'. Finally, a child's 'the child-alone decision making' variable was created by assigning a given child a '1' if he (or she) answered either "I can make my own decision, but she would like me to consider her opinion", or "I can do what I want regardless of what she thinks", otherwise the variable was coded as '0'.

Overall, the study intended to examine the effects of parenting behaviors on multiple health outcomes for older children and young adolescents. Therefore, a number of study variables were included. As is seen in the diagram of the study hypothesis, some variables will be used as both independent variables and dependent variables in multiple regression analysis. For example, family meal behavior variables functioned as dependent variables when parenting behavior variables were involved as independent variables, whereas family meal behavior variables were included as independent variables when children's/adolescents' eating behaviors were the dependent variables. Table 6-39 gives an overview regarding units and scoring of study variables. Table 6-40, 6-41, 6-42, and 6-43 represent the summary of simple statistics of study variables for child, adolescent, male, and female subjects, respectively (see Appendix D). It needs to be noted that the values in the tables represent variables before they were transformed toward a normal distribution.

Tables 6-44 and 6-45 suggest that the energy and nutrient intake by children and adolescents are comparable to those obtained from a nationally representative sample (CSFII) (see Appendix D). The study subjects originally were divided into different weight categories such as “normal”, “at risk for overweight”, “overweight”, and “above normal” based on the BMI cutoffs indicated on the CDC 2000 Growth Chart. The CDC 2000 Growth Chart was the revision of 1977 NCHS Growth Chart and data from NHANES II (1976~1980) and NHANES III (1988-1994) were added to develop the newer version of national reference (189). The category “above normal” did not appear in the original CDC definitions, but the present study incorporated a combined category of the two highest CDC categories. Table 6-46 summarized the percentage of subjects who fell into each weight category based on the reference values in the 2000 CDC Growth Chart (see Appendix D). It appeared that considerable portion of study subjects (40.8% males vs. 33.6% females) fell to the category “above normal” and the heavier body weight trend is more conspicuous in males than females, except for 15-year old females. Since the 2000 CDC growth chart utilized anthropometric data up to 1994, comparison with a newer reference may be meaningful. Table 6-47 shows male and female subjects’ BMI distributions in terms of BMI-for-age percentile values**,** using the same NHANES 1999-2002 anthropometry database (see Appendix D). The left-hand column of each percentile range indicates corresponding BMI cutoff in the 2002

NHANES anthropometric data and the right-hand columns designate percentage of study subjects that fall into the ‘at or above’ the BMI percentiles. For example, 12.5% of 9-year-old males had a BMI that was at or above the 85th percentile of the 1999-2002 NHANES data. It appears that a substantial portion of 10-13 years old male subjects fell into the BMI category at or above the 85th percentile. In contrast, a relatively small number of 14 year-old males, 10-11 and 14 year-old females fell into the BMI category at or above the 85th percentile. If the same weight categories adopted in 2000 CDC growth charts are compared with this newer version of anthropometry reference, 16.6% males and 11.5% females would be classified as having BMI at the category “above normal” based on 1999-2002 anthropometric data. Comparison of the two national references suggested that there was an evidence of increasing trend of BMI of children/adolescents over time**,** because a relatively smaller percentage of subjects were classified to have “above normal” BMI when the 1999-2002 reference was used than the percentage of subjects who were classified to have “above normal” BMI based on 2000 CDC growth chart. In table 6-48, five measures of body measurements and BMI of study subjects are compared with NHANES 1999-2002 anthropometric data (190) (see Appendix D). It appeared that 13 year old boys were slightly heavier and 14 year old boys in the present study were slightly lighter than age-matched boys in the NHANES study. There was less difference in females’ body measurements between the two data sets.

CHAPTER VII

RESULTS

1. Multiple Regression Analysis

This chapter presents the results of multiple regression and path analysis. A brief mention of a writing convention is in order. Predictors that had the strongest relationship with a given dependent variable will be described in the text first, followed by the second most important predictor, followed by the third most important predictor, etc., based on the magnitudes of standardized regression coefficients.

1.1. Children

Tables 7-1 through 7-17 contain regression results pertaining to children's health outcomes. The wording children in relation with dependant variables were omitted sometimes in the text section due to space limitation; therefore the omitted wording for study subjects designate children in table 7-1 through 7-17 (see Appendix E).

1.1.1. Regression of Perception of Parenting Style on Parental Socioeconomic Status, Work-related Stresses, and Body Mass Index

Only one predictor proved statistically significant in this model (see Table 7-1). 1) The higher the parents' average BMI, the less likely both parents adopted authoritative parenting style.

1.1.2. Regression of Perception of Parenting Style Dimensions on Parental Socioeconomic Status, Work-related Stresses, and Body Mass Index

1) Family income was positively associated with the degree to which children perceived their fathers were nurturing (see Table 7-2). 2) The older the fathers were compared with their spouses, and the lower fathers' BMI, the lower the degree of control mothers used over their children. 3) The higher the fathers' BMI, the more control fathers used over their children.

1.1.3. Regression of Family Meal Behaviors on Perception of Parenting Style

1) The more authoritative the mothers and fathers were and the lower parents' average age was, the more likely children perceived family dinner as a ritual (see Table 7-3). Likewise, FA (father's authoritative style) and MA (mother's authoritative style) predicted children's perception that the family dinner was a ritual in separate models**,** controlling for parent's average age, but inclusion of the BA (both parents' authoritative style) variable explained more of the variation of children's perception of family dinner ritual than the MA or FA styles. Other family meal behaviors were not predicted by children's perception of parenting style.

1.1.4. Regression of Family Meal Behaviors on Perception of Parenting Style Dimensions

1) The more nurturing the father used in dealing with their children, the more frequently those children ate lunch with family (see Table 7-4). 2) The higher the family

income, the more nurturing the mothers were and the greater father's BMI was, the more frequently children ate dinner with family away from home. Also, family income, father's control, and father's BMI positively predicted children's frequency of eating dinner away from home with family. 3) The more nurturing the mothers were and the lower the average age of parents was, the greater the likelihood children perceived that dinner was a family ritual. A very similar relationship was found between children's perception of dinner as a family ritual and father's nurturing and parents' average age. 4) The more nurturing the mothers were, the more likely parents provided child's favorite foods for the child to eat. 5) When mothers used more control and were more educated, the children more frequently perceived that their mothers' criticized them about their eating. The more control the fathers used toward their children, the more frequently mothers criticized their children's eating. 6) In separate models, it was found that the higher the level of maternal/paternal control, the more likely children perceived that their fathers' criticized their eating habits. Children's perception of father's criticism regarding their eating habits was not associated with any other confounders, but only with perceived maternal/paternal control.

1.1.5. Regression of Self-Concept on Perception of Parenting Style

1) The more authoritative both parents were and the higher family income was, the higher the children's higher self-esteem tended to be (see Table 7-5). Likewise, MA and FA styles were significant predictors for children's greater self-esteem along with higher family income, but the BA style explained slightly more variation in this dependent variable compared with the contribution of the other two authoritative styles.

2) MA and children's White ethnicity predicted children's decreased perception that their mothers were concerned with their children's weight. Also, both parents' authoritativeness and child's White ethnicity predicted decreased maternal concern about child's overweight. 3) In separate models, MA and BA styles predicted a decrease in children's perception their father's were concerned about their children being overweight. Other confounders turned out to be non-significant.

1.1.6. Regression of Self-Concept on Perception of Parenting Style Dimensions

1) The more nurturing the mothers were and the greater the family incomes were, the children had greater self-esteem (see Table 7-6). Also, the two regression models show the greater father's nurturing, lower mother's control and lower father's control along with higher family income, the greater children's self-esteem. It was observed that parental nurturing appeared to have greater effects on children's self-esteem**,** compared with parental control based on each model's adjusted R^2 value. 2) Children's White ethnicity and a higher level of mother's nurturing were associated with less frequent perception that their mothers were concerned about their weight. Greater maternal control and children's non-White ethnicity predicted more frequent perception among children that their mothers were concerned about them being overweight. Likewise, children's non-White ethnicity and father's greater control predicted more frequent concern on the part of mothers about their children's weight. The model that contained maternal control and White ethnicity explained more variation of the dependent variable compared with that by the other two models. 3) Mother's greater control, father's

greater control, and mother's lower nurturing increased the likelihood that children perceived their fathers were concerned about them being overweight. Other confounders were not significant in these models.

1.1.7. Regression of Physical Activity Behaviors on Perception of Parenting Style Dimensions

1) The greater the family's income was and the more nurturing the fathers were, the log odds of participating team sport was increased in children (see Table 7-7).

1.1.8. Regression of Energy and Nutrient Intake on Perception of Parenting Style

1) The more educated the parents were on average and the more authoritative the fathers were, the greater the percent of calories from carbohydrates was consumed by children (Table 7-8). 2) The more educated the fathers were and the more authoritative the mothers were, the lower children's intake of calories from saturated fat tended to be. 3) The more authoritative the mothers were, the lower the amount of saturated fat children consumed.

1.1.9. Regression of Energy and Nutrient Intake on Perception of Parenting Style Dimensions

1) Parents' higher education in average and mother's grater nurturing predicted increased percentage of calorie consumption from carbohydrates (see Table 7-9). 2) Father's higher education and father's less control predicted children's decreased calorie intake from saturated fat. 3) Children who were White, more mature based on Tanner's Developmental Stage, more physically active, and whose father used greater control

tended to consume a greater amount of total sugar. 4) The greater father's control and the more likely the child was male, the greater that child's consumption of cholesterol.

1.1.10. Regression of Self-Concept on Family Meal Behaviors

1) The more children's perceived dinner as a family ritual, the higher family income, and the less frequently fathers criticized their children's eating habits, the greater children's greater self-esteem was likely to be (see Table 7-10). 2) White ethnicity and the perception of dinner as a family ritual was negatively related to, but maternal criticism of children's eating was positively related to, children's perception that their mothers were concerned about their weight. 3) White ethnicity and perception of family dinner as a family ritual was negatively associated with, but paternal criticism of children's eating was positively related to children's perception their fathers were concerned about their weight. 4) The greater the frequency of family breakfast, the more fathers were more educated than mothers, and the more likely the child was non-White, the greater children's perception they exercised at a high level. 5) The more frequently children ate dinner away from home with family, the more likely the children perceived themselves as gaining weight.

1.1.11. Regression of Eating Behaviors on Family Meal Behaviors

1) The more frequently children ate dinner with family, the less frequently children snacked (Table 7-11). 2) The higher the family incomes were and the more likely parents provided child's favorite foods, the children consumed food supplements more frequently. 3) The more frequently the children ate lunch with family, the less likely the children currently dieted.

1.1.12. Regression of Physical Activity Behaviors on Family Meal Behaviors

1) The higher the family income, the greater the perception of dinner as a family ritual, and the increased frequency of family dinner away from home, the more likely children tended to participate in team sports (see Table 7-12).

1.1.13. Regression of Energy and Nutrient Intake on Family Meal Behaviors

1) The higher father's education, the more likely the child was female, and the increased frequency children's participation in family lunch, the greater the children's intake of calories from carbohydrates (see Table 7-13). 2) The more likely the child was female and the less parents pressured their children to eat all of the food those children were served was associated with decreased calorie consumption from protein. 3) The more education the father had and the more likely parents provided child's favorite foods, the lower the amount of calories from saturated fats consumed by children. 4) The more likely the child was male and the greater the frequency children ate lunch with their families, the higher the percentage of the DRI for iron children consumed. 5) The greater parents' average BMI, the less food pressure parents placed on their children, and the more frequently children ate lunch with their families, the greater children's consumption of sodium. 6) The more likely the child was male, the more frequently children participated in family lunch, the higher father's BMI, and the greater children's perception that dinner was a family ritual, the greater the children's consumption of cholesterol.

1.1.14. Regression of Physical Outcomes on Family Meal Behaviors

1) The younger the parents were on average, the less frequently children ate lunch with family, and the more strongly children perceived dinner was a family ritual, the more likely the children had a BMI greater than the 85th percentile but less than the 95th percentile (see Table 7-14).

1.1.15. Regression of Energy and Nutrient Intake on Eating Behaviors

1) Increased frequency of snacking, child's being female and lower family income predicted decreased calorie intake from protein (see Table 7-15). 2) The more educated parents were on average and the less frequently children skipped their breakfast, the greater amount of calories they consumed per kilogram of body weight. 3) The greater the frequency of skipping breakfast and the lower the level of the mothers' education, the lower children's percent DRI for calcium. 4) The more frequently children skipped breakfast and the more likely the child was female , the lower the percent DRI for iron in the children's diets. 5) More frequent breakfast skipping by children and the lower the father's level of education, the lower children's percent DRI for folate. 6) More frequent skipping of breakfast was associated with lower percent DRI for vitamin A in the children. 7) The more likely the child was male, the more frequently children skipped breakfast, and the more likely the child was White, the lower children's percent DRI for fiber. 8) The more sexually developed the children were, the more educated the mothers were, and the more frequently the children snacked, the more likely these children consumed a greater amount of total sugar. 9) The more frequently children watched TV while eating dinner and the less frequently they consumed vitamin-

mineral supplements, the greater children's consumption of sodium. 10) The more likely the child was male and the greater the frequency of TV watching during dinner, the greater children's consumption of cholesterol. 11) The more frequently children consumed vitamin-mineral supplements, the more likely the children consumed less trans fat.

1.1.16. Regression of Physical Outcomes on Eating Behaviors

1) Children who were older, current dieted, their parents had higher BMI in average, male, and the parents were younger were likely to have greater body weight (see Table 7-16). 2) The more likely the child was presently dieting, the more likely the child was non-White, the greater the parents' average BMI, and the more frequently the child ate dinner while watching TV, the greater the child's BMI. 3) The more likely the child was presently dieting, the more likely the child was male, and the greater parents' average BMI, the higher the child's BMI –z score. 4) The greater the frequency of children's TV watching during dinner, the more likely the children were presently dieting, and the lower parental average age, the greater children's triceps skinfold thickness. 5) The greater parents' average BMI, the more likely the children are presently dieting, the lower the parental average age, and the more frequently TV was watched during dinner, the greater children's subscapular skinfold thickness. 6) The younger the average age of the parents and the more likely their children's were currently dieting, the greater children's waist circumferences tended to be. 7) The more likely children were presently not dieting, the lower parents' average BMI, and the more likely the children's ethnicity was White, the greater the tendency for children's BMI to

fall into the “normal” range (5^{th} and the 85^{th} BMI percentile). 8) The greater mothers’ BMI and the more likely the child was currently dieting, the greater the tendency for children to have a BMI in the “at risk for being overweight” ($85^{th} \leq$ BMI percentile < 95^{th}) category. 9) The more likely children were currently dieting, the greater the tendency for children’s BMI being in the “overweight” (BMI percentile $\geq 95^{th}$) category. 10) The more likely children were presently dieting behavior, the greater parents’ average BMI, and the more likely the child was of non-White ethnicity, the greater the likelihood of children’s BMI being in the “above normal” (BMI percentile $\geq 85^{th}$) range.

1.1.17. Regression of Energy and Nutrient Intake on Physical Activity Behaviors

1) The lower the parents’ average education and the increased frequency of sedentary activities in children, the greater children’s energy consumption from fat (see Table 7-17). 2) The lower level the fathers’ education and the more frequently children participated in sedentary activities, the more likely children consumed a greater amount of calories from saturated fat. 3) The less frequently children participated in sedentary activities and the more educated the parents were on average, the more likely the children consumed a greater percent of the DRI for vitamin C. 4) Children were more likely to have higher consumption of total sugar, if those children were more sexually developed, were White in ethnicity, and were less likely to engage in regular exercise.

1.2. Adolescents

Tables 7-18 through 7-39 contain regression results pertaining to adolescents' health outcomes, therefore the omitted wording with respect to study subjects designate adolescents (see Appendix E).

1.2.1. Regression of Perception of Parenting Style on Parental Socioeconomic Status, Work-related Stresses, and Body Mass Index

1) The more strongly the fathers were committed to their work, the less likely both parents utilized the authoritative style of parenting in dealing with their adolescents (see Table 7-18).

1.2.2. Regression of Perception of Parenting Style Dimensions on Parental Socioeconomic Status, Work-related Stresses, and Body Mass Index

1) The more fathers experienced work-related stress and the higher fathers' BMI scores were, the less nurturing mothers were towards their adolescents (see Table 7-19). 2) The more work stress fathers perceived and the higher the average of parents' BMI scores were, the less nurturing the fathers were towards their adolescents.

1.2.3. Regression of Family Meal Behaviors on Perception of Parenting Style

1) The lower the family incomes were and the more authoritative both parents were, the more frequently adolescents ate breakfast with their family (see Table 7-20). 2) The younger the mothers were and the more authoritative the fathers were, the more frequently adolescents ate lunch with family. 3) The more authoritative the fathers were,

the more frequently adolescents ate dinner with family. 4) In each of two models, the FA and BA styles were the best predictors of adolescents' frequency of eating dinner away from home with their family, respectively. However, FA was better predictor than the BA style, based on the amount of variation in the frequency of family dinner away from home that was explained by each model. 5) FA and father's lower BMI were significant predictors of adolescents' perception that dinner was a family ritual. Also, BA style predicted the perception of dinner as a family ritual, but the amount of the dependent variables' variation that was explained by this model was smaller than that in the model containing FA. 6) The more authoritative both parents were, the more likely parents were to put less pressure on their adolescents to completely consume their food. 7) MNA and the higher parents' average level of education, the lower the level of maternal criticism of their children's eating habits. Also, BA style of parenting and a lower level of average parental education were associated with greater maternal concern about their children's eating.

1.2.4. Regression of Family Meal Behaviors on Perception of Parenting Style Dimensions

1) The lower the family incomes were and the more control the mothers used over their adolescents, the adolescents were more likely to eat breakfast with their family (see Table 7-21). 2) Adolescents whose mother's were younger and whose fathers were more nurturing were likely to eat lunch more frequently with their families. Also, two other models that contained either maternal nurturing or paternal control with the same control variable (mother's age) predicted increased frequency of family lunch. It

appeared that paternal nurturing was a slightly better predictor of frequency of eating lunch with family in terms of adjusted R^2 values. 3) The greater the father's nurturing and the higher the level of mother's education, the greater the frequency the adolescents eating dinner away from home with their families. 4) Paternal nurturing, maternal nurturing, and paternal control predicted adolescents' perception that dinner was a family ritual in three separate models; in comparing these models it was found that paternal nurturing was the most important predictor in terms of adjusted R^2 values. 5) Maternal control and paternal control were significantly related to food pressure from parents, whereas the greater the maternal nurturing experienced by the adolescents, the lower likelihood that parents pressured their adolescents to eat. Comparison of adjusted R^2 values for these models indicated that maternal control was the most important predictor of the degree of parental food pressure, compared with other two parenting style dimensions. 6) Mother's lower educational achievements and maternal nurturing predicted an increased likelihood of parents providing child's favorite foods. Likewise, mother's lower education and paternal nurturing predicted increased tendency of parents providing their children with their favorite foods. 7) The greater mother's control and the higher the average level of the parents, the more frequently mothers criticized their children's eating habits.

1.2.5. Regression of Self-Concept on Perception of Parenting Style

1) The more likely the child is female, the greater the average of child's parents' BMI, and the more likely MNA was the parenting style used by mothers, the more likely adolescents perceived themselves as overweight (Table 7-22).

1.2.6. Regression of Self-concept on Perception of Parenting Style Dimensions

1) The more nurturing the father were toward their adolescents, the higher self-esteem the adolescents possessed (see Table 7-23). 2) Father's lower nurturing and the greater the average of parental BMI, the more likely adolescents perceived their mothers were concerned with those adolescents' weight. 3) The greater father's control and the more likely the child was female, the less likely adolescents perceived they had gained weight. Interestingly, greater father's nurturing and greater likelihood the child was female also predicted the lower likelihood adolescents perceived they had gained weight. Maternal nurturing was the only negative predictor of adolescents' perceived weight gain.

1.2.7. Regression of Eating Behaviors on Perception of Parenting Style Dimensions

1) Adolescents who consumed snacks less frequently had mothers who used greater control over their adolescents, and the adolescents were more likely be younger and female (see Table 7-24).

1.2.8. Regression of Physical Activity Behaviors on Perception of Parenting Style

1) The more authoritative the fathers were, the more likely the adolescents exercised regularly (see Table 7-25). 2) FA parenting style and mother's higher education predicted an increase in the frequency of adolescents engaging in hard

exercise. 3) The higher the family income and the more authoritative fathers' parenting style was, the more likely the adolescents participated in team sport activities.

1.2.9. Regression of Physical Activity Behaviors on Perception of Parenting Style Dimensions

1) The greater father's nurturing and the higher mothers' level of education, the more likely adolescents frequently engaged in hard exercise (see Table 7-26).

1.2.10. Regression of Energy and Nutrient Intake on Perception of Parenting Style

1) The greater the likelihood the child was female, the greater mother's BMI and the more likely MNA was present, the more likely that child ate fewer calorie per kilogram of body weight (see Table 7-27).

1.2.11. Regression of Energy and Nutrient Intake on Perception of Parenting Style Dimensions

1) The greater the likelihood the child was female and the greater mother's nurturing, the lower the child's consumption of total calories (see Table 7-28). 2) The grater the likelihood the child was female, the higher the mothers' BMI, and the greater mothers' control, the lower the consumption of calories per body kilogram weight. 3) The more control the fathers used, the greater difference between fathers' and mothers' age, and the younger the child was, the fewer the calories from carbohydrates the child consumed. 4) The more control father used over their adolescents, the higher percent calories the adolescents consumed from total fat. 5) The more likely the child was female and the greater fathers' nurturing, the less sodium the child consumed. 6)

Maternal control/paternal control along with two control variables, being male and of non-White ethnicity, predicted lower percent DRI of dietary fiber in separate models. Maternal control explained slightly more variation in percent DRI for fiber than did paternal control. 7) The greater mother's BMI and m the greater mother's nurturing, the less saturated fat that was consumed.

1.2.12. Regression of Physical Outcomes on Perception of Parenting Style

1) The greater the average of parental BMI scores, the more likely MNA was prevalent, and the older adolescents were, the greater the adolescents' body weight (see Table 7-29). 2) Parents' with lower averaged BMI scores and families in which MA parenting was likely were associated with lower BMI in adolescents. A second model was also fit to these data; here the lower the parent's average BMI and the more likely that BA style prevailed as the parenting style, adolescents were more likely to have a lower BMI, but the variance explained by this model was lower compared with that of the first model. 3) The greater averaged parental BMI and the greater the likelihood that MNA was a feature of parenting style in the home, the higher the BMI–z score. 4) The more likely the adolescents were female and the more likely MNA prevailed, the greater the supscapular skinfold thickness of the adolescents. 5) The presence of MA as maternal parenting style was the only significant predictor of lower waist circumferences of adolescents. 6) Two models were run for the dependent variable adolescents' BMI is in the normal range. MA predicted the increased tendency of adolescents' BMI to be "normal range" in the first model; in the second BA parenting style was positively

related to the chance of adolescents being in this normal range, but when the two models were compared, MA parenting appeared to be a better predictor based on the higher adjusted R^2 in the model containing MA style compared with the of the model containing the BA style. 7) The presence MA as a parenting style was negatively associated with the adolescents tendency to fall into the BMI “at risk for being overweight” category. 8) In separate models, the parenting styles of MA and BA predicted the decreased tendency of adolescents’ BMI to be in the “above normal” (BMI percentile $\geq 85^{th}$) category. Again, the model containing MA explained more variation in the dependent variable than the model containing BA style did.

1.2.13. Regression of Physical Outcomes on Perception of Parenting Style Dimensions

1) The greater the average of parents’ BMI, the older the child, and the greater mother’s control, the more adolescents weighed (see Table 7-30). 2) The greater the average of parents’ BMI, and the greater mother’s control, the greater adolescents’ BMI. 3) The greater the average of parents’ BMI, and the greater mothers’ control, the higher adolescents’ BMI–z score. 4) The greater mothers’ control and the more likely the child was female, the greater adolescents’ supscapular skinfold thickness was likely to be. 5) The greater mothers’ control, the larger adolescents’ waist circumferences were. 6) The greater mothers’ nurturing, the greater tendency of adolescents having BMI in the “normal” category, but greater control predicted decreased tendency of having BMI at the same category. 7) The greater mother’s control, the greater the likelihood the adolescents of being “at risk for being overweight”. 8) The greater mother’s control, the

greater the tendency for adolescents to fall into the "overweight" category. 9) The greater mother's control was associated with adolescents tendency to have a BMI in the "above normal" category, but the greater mother's nurturing, the less likely the adolescent fell into the "above normal" category. Again, mother's control explained more variation in this dependent variable than did mother's nurturing.

1.2.14. Regression of Self-Concept on Family Meal Behaviors

1) The greater the frequency of family dinners and the greater the tendency for parents to provide their child's favorite foods was positively associated with adolescents' self-esteem (see Table 7-31). 2) The greater the average of parents' BMIs and the more frequently mothers criticized their children's eating habits was associated with adolescents' perception that their mothers were concerned with their weight. 3) The more frequently fathers' criticized their children's eating habits and the higher fathers' BMI, the more likely children perceived their parents were concerned about them being over-weight. 4) The more strongly adolescents perceived the family dinner meal as a ritual, the less likely the adolescents perceived they had gained weight.

1.2.15. Regression of Eating Behaviors on Family Meal Behaviors

1) Parents' increased lack of food pressure and adolescents' decreased perception of dinner a family ritual predicted increased frequency of skipping breakfast (see Table 7-32). 2) Lower perception of dinner a family ritual and mother's more frequent criticism about child's eating predicted more frequent snacking among adolescents. 3) Increased degree of parental lack of food pressure and parents' being less educated predicted increased frequency of TV watching while eating dinner.

1.2.16. Regression of Physical Activity Behaviors on Family Meal Behaviors

1) The more frequency the children reported eating lunch with their families, the less likely those children engaged in hard exercise (see Table 7-33). 2) The older the average of the parents' ages, the more likely the child was male, and the greater the tendency for parents to provide their children's favorite foods, the greater the frequency they engaged in sedentary activities.

1.2.17. Regression of Energy and Nutrient Intake on Family Meal Behaviors

1) The more likely the children were female, the greater the degree of lack of food pressure from their parents, and the less the children perceived the family dinner as a ritual, the lower the children's consumption of total calories (see Table 7-34). 2) The more likely the child was female, the greater the lack of food pressure from their parents, and the greater mother's BMI, the lower the caloric intake per kilogram body weight among adolescents. 3) The more frequently adolescents participated in family lunches, the greater the intake of percent calories from total fat. 4) The lower the parental food pressure on children and the more likely the children were female, the lower percent of the DRI for calcium in their diets. 5) The more likely the child was female, the older the child, and the lower degree of parental food pressure, the lower percent of the DRI for iron in the child's diet. 6) The more likely the child was female, the less food pressure the parents exerted, and the greater mothers' BMI, lower percent of the DRI for folate in the child's diet. 7) The lower the average of the parents' education level and the lower

the level of parental food pressure, the lower percent of the DRI for vitamin A. 8) The more likely the child was of White ethnicity, the less frequently the child ate dinner away from home with other family members, and the more likely the child was female, the higher the percent of the DRI for dietary fiber in the child's diet. 9) The more likely the adolescent was female and the lower parental food pressure on these adolescents, the lower their sodium intake. 10) The more likely the adolescent was female and the less food pressure from parents was associated with decreased consumption of cholesterol by these adolescents.

1.2.18. Regression of Physical Outcomes on Family Meal Behaviors

1) The greater the average of the parents' BMI, the more frequently fathers criticized their adolescent's eating habits, and less likely fathers' age exceeded their wives' age, the greater the adolescents' waist circumferences (see Table 7-35).

1.2.19. Regression of Energy and Nutrient Intake on Eating Behaviors

1) The greater the likelihood the adolescent was female, the greater the frequency of snacking, the less often the adolescent skipped breakfast, the greater adolescents' total calorie consumption (see Table 7-36). 2) The greater the frequency adolescents skiped breakfast, the lower their frequency of snacking, and the morel likely the adolescents were female, the lower the adolescents' calorie consumption per kg of body weight. 3) The more likely the adolescent's were White, the less often the adolescents snacked, and greater difference between fathers' and mothers' ages, the greater the percent calorie obtained from protein in their diets. 4) The more frequently adolescents skipped breakfast, the higher percent calories they consumed from total fat. 5) The lower

mother's BMI and the more frequently adolescents' watched TV while they ate dinner, the greater the percent calories from saturated fat in their diets. 6) The more frequently adolescents skipped breakfast and the less snacking they did, the lower the percent of the DRI for calcium they consumed. 7) The more often adolescents skipped breakfast and more likely the adolescent was female, the lower percent of the DRI for iron those adolescents consumed. 8) The more frequently adolescents' skipped breakfast, the more likely the child was female, and the greater mothers' BMI, the lower the percent of the DRI for folate the adolescents consumed. 9) The more frequently the adolescents skipped breakfast and lower the average of their mothers' and fathers' education, the lower the percent of the DRI for vitamin A was in their diets. 10) The more likely the adolescents were non-White and the more they skipped breakfast, the lower percent of the DRI from vitamin C they consumed. 11) The more frequently adolescents skipped breakfast, the more likely the adolescents were non-White, the more likely the adolescents were male, and the less often they snacked, the lower the percent of the DRI for fiber they consumed. 12) The more frequently adolescents reported skipping breakfast, the more likely they were female, the younger adolescents they were, the older their father was compared to mothers, and the less frequently they engaged in snacking, less total sugar they consumed. 13) The more likely the adolescents were male and greater their frequency of snacking, the more sodium they ingested. 14) The more likely the adolescents were female, the less often they watched TV while eating dinner, and the more often they skipped breakfast, the lower their consumption of cholesterol. 15) The greater the frequency adolescents' snacking, the greater their consumption of saturated fat.

1.2.20. Regression of Physical Outcomes on Eating Behaviors

1) The greater the average of mothers' and fathers' BMI, the more often adolescents skipped breakfast, and the older the adolescents were, the more they weighed (see Table 7-37). 2) The greater the average of parents' BMI, the more frequently adolescents skipped breakfast, and the lower the frequency they snacked, the greater their BMI. 3) The greater the average of parents' BMI, the less snacking adolescents engaged in, and the more often the adolescents skipped breakfast, the greater their BMI-z scores. 4) The greater the likelihood the adolescents were female, the greater the average of parents' BMI, the younger the average of parents' ages were, and the more likely these adolescents were currently dieting, the greater those adolescents' triceps skinfold thicknesses were. 5) Adolescents who were currently dieting and the greater the average of parents' BMI, the greater the adolescents' subscapular skinfold thickness. 6) The greater the average of parents' BMI, the smaller difference mothers' and father's ages, and the more likely the adolescents were currently dieting, the greater these adolescents' waist circumferences were. 7) The greater the average of parents' BMI and the more likely the adolescents' were currently on a weight-loss diet, the greater the tendency for the adolescent to be in the "overweight" category.

1.2.21. Regression of Energy and Nutrient Intake on Physical Activity Behaviors

1) The greater the frequency with which adolescents engaged in hard exercise, the lower their percent caloric intake from total fat (see Table 7-38). 2) The lower mothers' BMI and more frequently adolescents performed hard exercise, the lower their percent calories from saturated fat. 3) The more likely the adolescents were male, the lower their mother's BMI, and the more they engage in light exercise, the greater their consumption of calories per kg body weight. 4) The higher the average of parents' levels of education and the lower the frequency of their sedentary activities, the higher their percent of the DRI for vitamin A.

1.2.22. Regression of Physical Outcomes on Physical Activity Behaviors

1) The more likely the adolescents were female, the greater the average of parents' BMI, and the less frequently the adolescents engaged in hard exercise, the grater the adolescents' triceps skinfold thickness (see Table 7-39). 2) The greater the average of parents' BMI , the greater the likelihood the adolescents were female, and lower the frequency adolescents performed hard exercise, the greater the adolescents' subscapular skinfold thickness.

1.3. Male Subjects

Tables 7-40 through 7-60 contain regression results pertaining to male subjects' health outcomes, therefore the omitted wording for study subjects designate male subjects (see Appendix E).

1.3.1. Regression of Perception of Parenting Style on Parental Socioeconomic Status, Work-related Stresses, and Body Mass Index

1) The more work-related stress fathers experienced, the less likely fathers adopted a authoritative parenting style (see Table 7-40).

1.3.2. Regression of Perception of Parenting Style Dimensions on Parental Socioeconomic Status, Work-related Stresses, and Body Mass Index

1) The younger the male subjects' fathers were and the higher those fathers' BMIs were, the more male subjects perceived their mothers exercised control over them (see Table 7-41). 2) The older the mothers were, the lower paternal control male subjects perceived.

1.3.3. Regression of Family Meal Behaviors on Perception of Parenting Style

1) The younger the male subjects were and the more authoritative their mothers were, the more frequently these male subjects ate breakfast with their families (see Table 7-42). 2) The lower the average of the parents' ages and the more likely a FA style was practiced, the greater the likelihood males' ate lunch frequently with their families. In addition, the lower the average of parents' ages and the more likely BA parenting style was practiced, the more often males at lunch with their families. 3) The higher family income and the more likely either MA or BA was the parenting style practiced, the more frequently males participated in family dinners eaten away from home, but MA explained a slightly higher amount of variance in this dependent variable. 4) The

presence of FA parenting, the younger and the more physically active the males were, the more likely those males perceived their families' dinners as rituals. In two separate regression models, the presence of either BA or MA forms of parenting were significantly related to the males' perception that dinner was a ritual in their families, but the amount of variance explained by either BA or MA style was smaller than that produced by the FA style of parenting model. 5) The presence of a BA parenting style and older the males' ages were, the less likely those males experienced food pressure from their parents. 6) The older the male children, the lower his parents' averaged ages, and the more likely his parents adopted a BA parenting style, the more likely his parents provided him with his favorite foods. 7) The lower their fathers' education and the more likely their mothers practiced MNA parenting, the less likely they perceived their mothers' criticized their eating habits.

1.3.4. Regression of Family Meal Behaviors on Perception of Parenting Style Dimensions

1) Males whose fathers engaged in nurturing and whose fathers were younger tended to eat lunch more frequently with their families (see Table 7-43). Maternal nurturing received by these males explained slightly less of the variation in this dependent variable. 2) Receipt of paternal nurturing and the lower their mothers' BMI, the more frequently males participated in family dinners. 3) Family income and maternal nurturing was positively associated with frequency males subjects participated in family dinners eaten away from home. Paternal nurturing was also associated with, but explained slightly less variation in this same dependant variable. 4) The greater the

paternal nurturing and younger the child’s age were positively associated with males’ perception that dinner was a family ritual, whereas maternal nurturing and maternal/paternal control explained relatively small amounts of variation in this dependant variable. 5) The more controlling the mothers were, and the younger the male subjects were, the more likely parents used food pressure in dealing with their male offspring. 6) Males being older, parents being younger in average, and the more nurturing fathers were the predictors of males’ perception that their parents were more likely to provide their children with their favorite foods. Older age, older the average age of both parents, and the presence of maternal nurturing were also positively associated with males’ perception that parents provided their male offspring with their favorite foods. 7) Greater maternal control, the greater the childe was White, and the greater the fathers’ education were positively associated with males perception that their mothers were critical of the males’ eating habits. 8) In separate models, either maternal or paternal control, and paternal education were positively associated with paternal criticism of the males’ eating habits.

1.3.5. Regression of Self-Concept on Perception of Parenting Style

1) Authoritative parenting style along with maternal education and males’ developmental maturity were positively associated with males’ self-esteem, but the presence FA of parenting explained a greater amount of variance in males’ self-esteem than MA or BA parenting did (see Table 7-44).

1.3.6. Regression of Self-Concept on Perception of Parenting Style Dimensions

1) Parental nurturing along with maternal education and male subjects' developmental maturity were positively associated with males' self-esteem, where paternal nurturing explained the more of the variance in males' self-esteem than the level of maternal nurturing did (see Table 7-45).

1.3.7. Regression of Eating Behaviors on Perception of Parenting Style

1) Male subjects who were more likely to be White and who experienced the FNA style of parenting were more likely to snack (see Table 7-46).

1.3.8. Regression of Physical Activity Behaviors on Perception of Parenting Style Dimensions

1) Paternal nurturing and developmental immaturity were negatively associated with frequency of snacking (see Table 7-47). 2) Developmental immaturity and maternal control were positively associated with male subjects' dieting behavior; that is, males who were less mature and whose mothers were more likely to be controlling were more likely to be on a diet.

1.3.9. Regression of Physical Activity Behaviors on Perception of Parenting Style

1) Males whose mother adopted the MA style of parenting and who were older were more likely to exercise regularly (see Table 7-48). 2) Maternal age, MA parenting, and paternal BMI were positively associated with males' frequency of hard exercise. The BA style was also a significant predictor, but it explained slightly less variance of

this dependant variable. 3) Authoritative parenting style, maternal age, and the probability that males were non-White were positively associated with males' frequency of sedentary activities, but BA parenting appeared to be a slightly better predictor than either MA or FA styles of parenting.

1.3.10. Regression of Physical Activity Behaviors on Perception of Parenting Style Dimensions

1) Parental nurturing, non-White race, and maternal age were positively associated with frequency of males' sedentary activities, but maternal nurturing appeared to be a slightly better predictor than paternal nurturing**,** based on the amount of variance explained by the two models (see Table 7-49).

1.3.11. Regression of Energy and Nutrient Intake on Perception of Parenting Style

1) The more likely male subjects were physically mature and being more likely to experience the MNA style of parenting were positively associated with total sugar consumption by these males (see Table 7-50). 2) MA parenting and maternal BMI were negatively associated with the amount of saturated fat consumption by males.

1.3.12. Regression of Energy and Nutrient Intake on Perception of Parenting Style Dimensions

1) Maternal control and averaged parental education were negatively associated with percent calorie intake from total fat among male subjects (see Table 7-51). 2) Paternal nurturing and males' activity level were positively associated with percent calorie consumption from protein. 3) The more control father used in dealing with their

sons, the more likely the male children consumed lower amount of dietary fiber compared with the recommended amount for children.

1.3.13. Regression of Physical Outcomes on Perception of Parenting Style Dimensions

1) Males' age was a positive predictor, but paternal control was a negative predictor of male subjects' height (see Table 7-52). 2) Paternal control was negatively associated, but family income was positively associated with males' having normal body weight (determined by BMI percentile). 3) The more control the father used over their sons and the lower family incomes were, the more likely the male subjects had BMI scores that were above the normal range.

1.3.14. Regression of Self-Concept on Family Meal Behaviors

1) The greater the likelihood that male subjects perceived their dinners as a family ritual, were physically mature, participated more frequently in family dinner, had mothers' with more education, and had parents who provided these males' their favorite foods were more likely to have high self-esteem (see Table 7-53). 2) Father's age and frequency of family lunch were negatively associated with males' perception that their mothers were concerned about them being overweight, but maternal criticism of their sons' eating habits were associated with the greater likelihood males' had this perception. 3) Paternal age and frequency males' participation in family lunch were negatively associated with males' perception that their fathers' were considered with their sons being overweight, but paternal criticism about child's eating was positively associated with this perception. 4) Males' perception that dinner was a family ritual and maternal

age were positive predictors of males' self perceived activity level. 5) The tendency for male subjects to perceive that dinner was a family ritual was negatively associated with males' self perceived weight gain.

1.3.15. Regression of Eating Behaviors on Family Meal Behaviors

1) The frequency with which males ate breakfast with family was a negative predictor, but lack of food pressure from parents was a positive predictor of male subjects' frequency of skipping breakfast (see Table 7-54). 2) The frequency with which males ate dinner with their families and maternal BMI were negatively associated with males' frequency of snacking. 3) Paternal criticism of their sons' eating habits was negatively associated, but the frequency with which those sons ate breakfast with their families and paternal education were positively associated with males' frequency of consuming vitamin-mineral supplements. 4) The more frequently males perceived maternal criticism of their eating habits and the more likely males were physically immature, the less frequently males watched TV while eating dinner. 5) Males who were older, who were less likely to perceive that their fathers were critical of their eating habits, and who ate lunch frequently with their families, and were more likely to participate family dinners eaten away from home were less likely to be dieting at present.

1.3.16. Regression of Physical Activity Behaviors on Family Meal Behaviors

1) Male subjects who perceived that dinner was a family ritual and male subjects' ages were positively associated with their tendency of doing exercise on a regular basis

(see Table 7-55). 2) Family income and males' perception that dinner was a family ritual were positive predictors of males' tendency to participate in team sport.

1.3.17. Regression of Energy and Nutrient Intake on Family Meal Behaviors

1) The likelihood the males were White was negatively associated, but the tendency for males to perceive dinner a as family ritual was positively associated with the percent calories males obtained from protein (see Table 7-56). 2) Males' age, maternal BMI, and the perception that their parents provided these males' favorite foods were negatively associated with calories consumed per kg of body weight. 3) Maternal BMI and frequency with which the males ate dinner away from home with their families were negatively associated with males' percent of the DRI for calcium in their diets. 4) Male subjects' age and the frequency with which they participated in family dinner away from home were negatively associated with males' percent of the DRI for iron in their diets.

1.3.18. Regression of Physical Outcomes on Family Meal Behaviors

1) The older the male subjects and the less frequently males participated in family lunch, the lower males' BMIs were (see Table 7-57). 2) The less physically mature these male subjects were, the more strongly they perceived that dinner was a family ritual, the greater males' triceps skinfold were. 3) Males who had greater subscapular skinfolds were more likely to have parents who were younger on average, participated less frequently in family lunches, were more likely to have parents whose average BMI was higher, and were more likely to perceive dinner was a ritual. 4) Being

White and the frequency of participating in family lunch were negatively associated with the tendency of males' having BMI at the "overweight" category.

1.3.19. Regression of Energy and Nutrient Intake on Eating Behaviors

1) The older the males, the less frequently they skipped breakfast, and the more frequently they snacked, the more likely the male subjects were to consume a greater amount of total calories (see Table 7-58). 2) Males' age and their frequency of skipping breakfast were negative predictors of, but their frequency of snacking was positive predictor of the amount of calorie consumed pre kilogram body weight. 3) Paternal education was a negative predictor, but frequency of snacking was positive predictor of percent of calories consumed from saturated fat. 4) The greater the likelihood the male subjects were White and the more often they were likely to snack, the higher their consumption of calories consumed from protein (%). 5) Males' frequency of skipping breakfast and their mothers' BMI were negative predictors of the percent DRI for calcium in their diets. 6) Percent DRI for iron was solely predicted by males' frequency of skipping breakfast; the more frequently they skipped breakfast, the lower their percent DRI for iron. 7) The frequency with which males skipped breakfast and watched TV while eating dinner were negatively associated with males' percent DRI for folate. 8) The more often males' skipped breakfast and the more likely they were physically mature, the more likely their percent DRI for vitamin A was lower. 9) The frequency of skipping breakfast by male subjects was negatively associated with percent DRI for vitamin C. 10) The frequency with which male s skipping breakfast negatively predicted males' percent DRI for dietary fiber. 11) Being physically mature, skipping breakfast

more often and more frequent snacking were positively associated with amount of total sugar consumed by males. 12) Sodium consumption was positively associated with frequency males watched TV. 13) Male who were more physically active, who frequently watched TV while eating dinner, and with fathers who were older in age compared with their spouses' age were more likely to consume a greater amount of cholesterol.. 14) Frequent snacking and less frequent skipping breakfast were associated with a greater consumption of saturated fat by males.

1.3.20. Regression of Physical Outcomes on Eating Behaviors

1) The higher the average age of the parents and the greater the frequency of male snacking, the lower male subjects' BMI z-score, but the higher the average of parents' BMI, the higher males' BMI z- score (see Table 7-59). 2) The more frequency male subjects snacked, the older their fathers were, and the more physically-mature they were level were, the smaller their triceps skinfolds tended to be, but the frequency of watching television while eating dinner was positively associated with triceps skinfold thickness. 3) Males whose parents were older were more likely to have lower subscapular skinfolds, but males whose parents had larger BMIs and who watched TV while eating dinner were more likely to have higher subscapular skinfold thickness. 4) Males who were dieting and whose parents' tended to have higher BMIs were less likely to have a BMI at "normal weight", but males' chances of being White increased their tendency of having a normal weight. 5) The older the average parental age of male subjects, the more frequently those subjects snacked, and the lower their parents' average BMI, the less likely males were to have a BMI in the above "normal weight"

category. 6) Greater parental average age of male subjects was negative predictor of, but males' current dieting behavior was a positive predictor of being overweight ($\geq 95^{th}$ percentile).

1.3.21. Regression of Energy and Nutrient Intake on Physical Activity Behaviors

1) Males' frequency of sedentary activities and males' age were negatively associated with percent DRI from vitamin C (see Table 7-60).

1.4. Female Subjects

Tables 7-61 through 7-79 contain regression results pertaining to female subjects' health outcomes, therefore the omitted wording for study subjects designate female subjects (see Appendix E).

1.4.1. Regression of Perception of Parenting Style on Parental Socioeconomic Status, Work-related stresses, and Body Mass Index

1) Father's work spillover to family predicted a greater tendency of mothers to adopt an authoritative parenting style in dealing with their daughters (see Table 7-61). 2) Family income was positively associated fathers' tendency to employ an authoritative style of parenting, but average parental BMI was negatively associated with the tendency of fathers adopt the authoritative style in parenting their daughters. 3) Parental average BMI was negatively associated, but family income was positively associated with tendency for both parents to adopt an authoritative parenting style with their daughters.

1.4.2. Regression of Perception of Parenting Style Dimensions on Parental Socioeconomic Status, Work-related stresses, and Body Mass Index

1) For females, the higher family income was and the lower BMI father had, the more nurturing the father expressed (see Table 7-62). 2) The older the females' fathers were compared with their mothers, the less control over both parents utilized in their dealings with their females offspring.

1.4.3. Regression of Family Meal Behaviors on Perception of Parenting Style

1) The lower the family income, the younger the female subjects, and the more likely both parents adopted authoritative style towards these subjects, the more frequently females ate breakfast with family (see Table 7-63). 2) For females, the greater fathers' the more frequently they ate dinner with their families, but females the average age of whose parents' was older, tended to eat dinner with their families less frequently. 3) In two separate regression models, the parenting styles of FA and BA were positive predictors of frequency with which females joined their families in order to eat dinner away from home. 4) In females, the lower the average level of their parents' age, the more likely both their parents adopted the authoritative parenting style, and the lower their parents' average BMI, the more likely females perceived dinner as a family ritual. The FA parenting style also predicted the greater likelihood that females perceived dinner as a family ritual along with the two control variables. 5) Females whose families' incomes were higher, who were less physically active, whose mothers

adopted an authoritative parenting style, and whose fathers had larger BMIs were more likely to perceive a lack of food pressure from their parents. The BA style of parenting also positively predicted the lack of food pressure for females, along with the three control variables, but this model explained less variation in this dependent variable was explained compared with the first. 6) The MA style positively predicted the tendency of parents to provide females with their favorite foods.

1.4.4. Regression of Family Meal Behaviors on Perception of Parenting Style Dimensions

1) Paternal age was negative predictor, but paternal control was positive predictor of how frequently females ate lunch with their families (see Table 7-64). 2) Paternal control and paternal nurturing predicted frequency females joined their families in eating dinner away from home: the greater each of these parenting variables, the more frequently females ate out with their families. Paternal control and maternal nurturing also positively predicted the frequency with which females participated in family dinners eaten away from home. 3) In separate regression models, both maternal an paternal nurturing were positively associated with, but the older both parents were and parental average BMI were negative predictors of females' perception of that their family dinners were rituals. Maternal nurturing explained slightly more variation in this dependent variable than did paternal nurturing. 4) Family income, females' level of physical activity, maternal nurturing, and paternal BMI positively predicted the lack of food pressure from parents experienced by females. Paternal nurturing also positively predicted lack of parental food pressure along with the three control variables, but the

variation explained was slightly lower in this model than in the first model. 5) Maternal nurturing was positively associated with parents provision of females' favorite foods. 6) Paternal control was positively associated with maternal criticism of females' eating habits. 7) Paternal control and maternal age positively predicted father's criticism of females' eating habits.

1.4.5. Regression of Self-Concept on Perception of Parenting Style

1) Both BA parenting and FA parenting positively predicted self-esteem in females in separate bi-variate regression models (see Table 7-65). 2) MA parenting was negative predictor, but females' being mature and average parental BMI were positive predictors of female subjects' perception their mothers were concerned about these females' being overweight. 3) Paternal BMI was positively associated, but the BA parenting style was negatively associated with female subjects' perception their fathers were concerned about their weight.

1.4.6. Regression of Self-Concept on Perception of Parenting Style Dimensions

1) The more control fathers used in dealing with their daughters, the lower the self-esteem these girls exhibited (see Table 7-66). Paternal nurturing was a positive predictor of female subjects' self-esteem, but the variation explained was smaller than that explained by paternal control. 2) Maternal nurturing was negatively associated with females' belief that their mothers were concerned about them being overweight, but parental average BMI was positively associated with females' perception of their mothers' had such concerns. Maternal control and average parental BMI positively

predicted perceived maternal concern about daughters' overweight. 3) Paternal control and paternal BMI were positively related to daughters' perception their fathers were concerned about the daughters being overweight. 4) The use of control mothers used over their female children, the less likely these female children were to perceive they were gaining weight.

1.4.7. Regression of Eating Behaviors on Perception of Parenting Style

1) MA parenting was positively associated with the frequency of females' snacking (see Table 7-67). 2) FA parenting style, maternal education, and females' activity level negatively associated with the frequency those females ate dinner watching TV. In addition, BA parenting and the other two control variables were negatively associated with the frequency of TV watching while eating dinner among female subjects.

1.4.8. Regression of Physical Activity Behaviors on Perception of Parenting Style Dimensions

1) Family income and maternal nurturing were positively associated with females' tendency to participate in team sports (see Table 7-68). 2) Family income and paternal nurturing were also positively associated with the tendency of team sport participation.

1.4.9. Regression of Energy and Nutrient Intake on Perception of Parenting Style

1) In separate regression models, the more likely either FA parenting BA parenting were employed, the lower the percentage calories from saturated fat in

females' diets (see Table 7-69). FA parenting explained more variance in this dependant variable than did BA parenting. 2) MA parenting style was a positive predictor of females' percent DRI for fiber. 3) Females who consumed higher amount of total sugar were more likely to be physically mature and their fathers were likely to have adopted an authoritative style and their mothers were more educated.

1.4.10. Regression of Energy and Nutrient Intake on Perception of Parenting Style Dimensions

1) Paternal nurturing was negative predictor, but maternal BMI and parental age difference were positive predictors of females' percent calories from protein (see Table 7-70). 2) The more control father used over their daughters, the greater the amount of calories from fat these children tended to consume. 3) Paternal control was positively related to the percentage of calorie consumption from saturated fat in female subjects' diets. 4) The more controlling the fathers were, the greater amount of saturated fat their daughters were likely to consume.

1.4.11. Regression of Self-Concept on Family Meal Behaviors

1) The frequency females ate dinner with their families was positively associated with their self-esteem (see Table 7-71). 2) Females' perception that dinner was a family ritual and the tendency of their parents to provide them with their favorite foods were negatively associated with females' perception that their mothers were concerned about them being overweight. 3) The more likely females perceived their dinners were family rituals and the more likely their parents provide them with their favorite foods, the more

likely these females perceived that their fathers' were concerned about them being overweight.

1.4.12. Regression of Eating Behaviors on Family Meal Behaviors

1) Parents provision of their daughters' favorite food was a negative predictor of, females' age was positive predictor of, but daughters' perception that dinner was a family ritual negative predictor of the frequency those daughters skipped breakfast (see Table 7-72). 2) Paternal criticism of daughters' eating habits and lack of food pressure on these daughters from parents were positively associated with frequency of daughters' snacking. Maternal criticism about their daughters' eating and lack of food pressure from parents also predicted frequency of daughters' snacking. 3) Females who watched TV more frequently while eating dinner tended to have mothers who were less well-educated, were more likely to perceive paternal criticism of their eating habits, who were physically less active, and were less likely to perceive family dinner meal as a ritual. 4) Frequency of family breakfast was negative predictor of, but paternal BMI was positive predictor of females' current dieting.

1.4.13. Regression of Physical Activity Behaviors on Family Meal Behaviors

1) Mother's criticism of daughters' eating positively predicted, but parents provide daughters' favorite foods negatively predicted the frequency of daughters' sedentary activities (see Table 7-73).

1.4.14. Regression of Energy and Nutrient Intake on Family Meal Behaviors

1) The frequency of daughters participating in family lunch and paternal BMI were positive predictors of the amount of total calorie consumed by daughters (see Table 7-74). 2) The older the females were and the less frequently they participated in family lunch, the lower amounts of calories per kilogram body weight the females consumed. 3) Females' age was positively associated with, but lack of food pressure from their parents was negatively associated with percent calorie from protein in their diets. 4) Paternal criticism of their daughters' eating habits and the frequency with which those daughters participated in family lunch were positively associated with the percent calorie from total fat in the daughters' diets. 5) Maternal criticism of daughters' eating habits was positively associated with, but daughters' age was negatively associated with percent DRI for calcium in those daughters' diets. 6) he frequency of family lunch and maternal education were positive predictors of percent DRI fro iron. 7) Frequency of family dinner away from home was negatively associated with, but frequency of family lunch and maternal education were positively associated with percent DRI for dietary fiber. 8) Frequency of family lunch and parental average BMI were positive predictors of the amount of sodium consumed. 9) The more frequently females participated in family lunch, the greater amount of cholesterol they consumed. 10) The frequency with which daughters' ate lunch with their families lunch and paternal BMI were positively associated with daughters' consumption of saturated fat. 11) Paternal criticism of daughters' eating habits and daughters' age were negatively associated with, but lack of

food pressure from parents were positively associated with daughters' consumption of trans fat.

1.4.15. Regression of Physical Outcomes on Family Meal Behaviors

1) Parental average BMI was a positive predictor of, but parents provision of daughters' favorite foods was negative predictor of daughters' triceps skinfold thickness (see Table 7-75).

1.4.16. Regression of Energy and Nutrient Intake on Eating Behaviors

1) The more frequently females skipped breakfast and the lower parental average BMI was, the greater the likelihood that females consumed a lower amount of total calories (see Table 7-76). 2) Females' age, frequency of skipping breakfast, and paternal BMI were negative predictors of amount of calories they consumed per body kilogram weight. 3) The frequency with which female subjects skipped breakfast was negatively associated with their percent calories from carbohydrates. 4) The frequency of females' snacking was negatively associated with, but females' age, paternal BMI, and their frequency of TV watching while eating dinner were all positively associated with percent calories from protein in their diets. 5) Female subjects' frequency of skipping breakfast was positively associated with, but frequency of vitamin-mineral supplement intake was negatively associated with females' percent calorie from fat. 6) The frequency with which daughters skipped breakfast was a negative predictor of, but maternal education was positive predictor of percent DRI for calcium in daughters' diets. 7) Daughters' age and frequency of skipping breakfast were negatively associated with, but maternal education was positively associated with daughters' percent DRI for iron.

8) Parental average education level was positive predictor of, but frequency of their daughters' skipping breakfast was negative predictor of percent DRI for vitamin A in daughters' diets. 9) Females' age and frequency wit which they skipped breakfast were negatively associated with percent DRI for folate in females' diets. 10) The frequency of females' skipping breakfast was negatively associated with percent DRI for dietary fiber in their diets. 11) Frequent snacking by females was positively associated with their total sugar consumption, but frequency with which they skipped breakfast was negatively associated with the amount of total sugar they consumed, whereas family income and White ethnicity were positive predictors of females' total sugar consumption. 12) The frequency with which daughters took vitamin-mineral supplements was negatively associated with, but parental average BMI was positively associated with daughters' sodium consumption. 13) The frequency with which females' watched TV while eating dinner was positively associated with the amount of cholesterol they consumed. 14) The frequency of females' vitamin-mineral supplement intake was negatively associated with consumption of saturated fat by females.

1.4.17. Regression of Physical Outcomes on Eating Behaviors

1) Females' age, the average of parental BMIs, females' current dieting, and the frequency with which those females skipped breakfast were positive predictors of females' body weight (see Table 7-77). 2) Females' age, the average of parents BMI, females' current dieting behavior, and the more frequently females skipped breakfast were positively associated with females' BMI. 3) Average parental BMI, daughters' current dieting behavior, and frequency with which daughters' skipped breakfast were

positively associated with daughters' BMI z-score. 4) Females' current dieting and the average of parents BMIs were positive predictors of, but females' physical activity level was a negative predictor of females' triceps skinfold thickness. 5) Females' current dieting behavior, parental average BMI, and females' age were positively associated with subscapular skinfold thickness. 6) Females' age, current dieting, frequency of skipping breakfast, and average parental BMI were all positive predictors of females' waist circumference. 7) The average of parents' BMI and females' current dieting were negative predictors of females' being in the BMI at the "normal" category. 8) The average of parents' BMI and females' current dieting were positive predictors of females falling into the BMI places them the "at risk for overweight" category. 9) The average of parents' BMI and the frequency with which daughters skipped breakfast were positively associated with daughters falling into the BMI at "overweight" category. 10) The averaged parental BMI and current dieting by daughters were positive predictors of their being in the BMI at "above normal" category which is at or greater than the 85^{th} percentile.

1.4.18. Regression of Energy and Nutrient Intake on Physical Activity Behaviors

1) Females' age and the frequency of their sedentary activities were negatively associated with calories consumed per kilogram body weight (see Table 7-78). 2) Family income was positive predictor of, but frequency of sedentary activities was a negative predictor of females' percent calorie from carbohydrates. 3) Females' age was positively associated with, but their tendency to participate in team sports was negative a

predictor of percent calories from protein by females. 4) Regular exercise by females negatively predicted the amount of cholesterol those females consumed.

1.4.19. Regression of Physical Outcomes on Physical Activity Behaviors

1) Females' age, parental average BMI, and frequency of sedentary activities were positive predictors of body weight (see Table 7-79). 2) Averaged parental BMI was a positive predictor, but females' regular exercise was negative a predictor of females' triceps skinfold thickness. 3) The frequency of hard exercise engaged in by females was negatively associated with, but averaged parental BMI was positively associated with females having BMI in the "overweight" category.

2. Effects of Parenting Styles and Their Dimensions on Health Outcomes

This section begins first with a presentation of those statistically significant effects of parenting behaviors (measured by parenting styles and parenting style dimensions) on children and adolescents' health outcomes. While the ultimate goal of the study was to examine parental impact on overall health outcomes including self-concept, eating behaviors, physical activity behaviors, energy and nutrient intake, and body measurements, the effects of a particular parenting behavior on all five health outcomes appeared to be somewhat inconsistent, which caused some difficulty in interpreting the outcomes. Possible explanations for these inconsistencies include: 1) the energy and nutrient intake assessed by three days of dietary data provide only a snapshot of an individual's nutritional intake rather than a representation of usual intake. Furthermore, relationships between subjects' energy and nutrient intake and parenting behavior subjects experience may not be generalizable; 2) changes of body weight and shape occur over a long-term period with multiple contributors, whereas self-concept, eating and activity behaviors more likely have relatively direct associations with perception of parenting behaviors; and 3) individual's eating and physical activity behaviors have important effects on the individuals' energy and nutrient intake as well as the individuals' body measurement based on the multiple regression results. Finally, a decision was made to explore effects of parenting behaviors on subjects' self-concept, eating behaviors and physical activity behaviors together and the other two aspects of health outcomes, energy and nutrient intake and physical outcomes were considered individually and separately from the other three aspects of health outcomes.

2.1. Older Children's and Young Adolescents' Health Outcomes

2.1.1. Self-Concept, Eating Behaviors, and Physical Activity Behaviors

None of the parenting behaviors was associated with children's eating and physical activity behaviors. With respect to the MA (mother's authoritative style), it was positively associated with children's self-esteem, but negatively associated with children's perception of maternal/paternal concern about their being overweight. As with children, adolescents' eating and activity behaviors were not associated with the MA parenting style; however, adolescents were less likely to perceive themselves as overweight if their mothers used an authoritative parenting style. Regarding the FA (father's authoritative style), children had higher self-esteem if their father used the authoritative style of parenting.

The FA style was not associated with adolescents' eating behaviors and self-concept, but it was positively associated with adolescents' frequency of participation in physical activities such as regular exercise, hard exercise, and team sport participation. With respect to the BA (both parents' authoritative style), the desirable effects of BA parenting style on children's self-concept were stronger than those of MA or FA styles were. In adolescents, the BA parenting style did not predict eating behaviors**,** physical activity behaviors, or self-concept.

The more nurturing mothers provided their older children, the more likely these children had higher self-esteem and the less likely they perceived their mothers were concerned about their weight. Adolescents' eating and physical activity behaviors were not predicted by mother's nurturing; however, adolescents were less likely to perceive they were currently gaining weight if they perceived their mothers' engaged in nurturing. Regarding father's nurturing, the more nurturing the fathers were, the more likely their children participated in team sports and had higher self-esteem. Father's nurturing was found to increase adolescents' self-esteem and frequency of hard exercise, but was found to decrease children's perception their mothers were worried about their weight, the tendency to increase children's perception they were gaining weight, but had no effect on children's eating behaviors. By contrast, maternal control had negative effects on children's self-esteem. Also, children were more likely to perceive parental concern about child overweight as they perceived maternal greater control. The more control the mother used in dealing with their adolescents, the less frequently the adolescents consumed snacks. Mother's control had no effect on adolescents' physical activity behaviors and self-concept. With regard to paternal control, father's control had undesirable effects on children's self-concept. Father's control had no effect on most of adolescents' health outcomes, except for its effect on adolescents' tendency to believe that they were gaining weight.

2.1.2. Energy and Nutrient Intake

The MA parenting style was associated with decreased percent of caloric intake from saturated fat and decreased consumption of saturated fat in children, whereas the MA style was positively associated with calorie consumption per kilogram body weight in adolescents. The FA style of parenting was associated with only children's percent calories from carbohydrates. The BA parenting style had no effect on children/adolescents' energy or nutrient intake.

Mother's nurturing was associated with percent calories from carbohydrates in children and decreased consumption of total calories and saturated fat by adolescents. Father's nurturing was negatively associated with adolescents' consumption of sodium. Mother's control was negatively associated with caloric intake per kilogram body weight and percent of the DRI for dietary fiber in adolescents, while no direct effect of maternal control was found for children's energy and nutrient intake. Father's control predicted percent of caloric intake from saturated fat and increased consumption of total sugar and cholesterol by children. In adolescents, father's control was associated with a lower percentage of calories from carbohydrates and percent of the DRI for dietary fiber.

2.1.3. Physical Outcomes

None of children's body measurements or body weight-related categories was associated with children's perception of parenting style and parenting style dimensions. For adolescents' physical outcomes, the MA parenting style was associated with lighter body weight, lower BMI and BMI-z score, thinner subscapular skinfold, and slimmer waist circumference. Also, the MA parenting style increased their tendency of having a BMI in the "normal" category and decreased their tendency of having a BMI in the categories of "at risk of overweight" and "above normal." The FA style of parenting had no association with adolescents' physical outcomes, whereas the BA parenting style predicted lower BMI and decreased tendency of having a BMI in the "above normal" category.

Mother's nurturing was associated with the tendency of adolescents of having a BMI in the "normal" category, but a decreased tendency of being in the "above normal" category. For adolescents, mother's control was positively associated with heavier body weight, higher BMI and BMI-z score, greater subscapular skinfold and waist circumference. Also, maternal control predicted a decreased tendency of having BMI at the "normal" range, but increased tendencies of having BMI at "at risk of overweight" and "overweight" categories in adolescents.

In summary, some similarities and dissimilarities were found regarding parental impacts on children's/adolescents' health outcomes. Authoritative parenting style by mothers, fathers, or both parents had no effect on either children's or adolescents' eating behaviors. The BA parenting style was the most desirable for children's self-concept.

The MA parenting style had stronger effects than did the FA style of parenting in terms of children's body image. The FA style of parenting was a significant predictor of adolescents' physical activity behaviors. The MA parenting style was desirable for adolescents' body image. An apparent discrepancy between the two age groups was found in that the BA style had the most desirable effects in children but no effects in adolescents.

Regarding the parenting style dimensions and health outcomes, both maternal nurturing and paternal nurturing were desirable for children's self-esteem. Maternal nurturing and paternal nurturing were positively associated with children's body image and physical activity behavior, respectively. Adolescents whose mothers nurtured them were less likely to perceive they were gaining weight. Paternal nurturing was desirable for in terms of adolescents' health outcomes including frequent hard exercise, higher self-esteem, less frequent perception that their mothers' were concerned about their weight, and less frequent perception that they were gaining weight. Maternal control and paternal control was undesirable in its effects on children's self-esteem and body image. By contrast, neither maternal control nor paternal control had negative effect on adolescents' health outcomes; maternal control and paternal control were associated with adolescents' less frequent snacking and less likelihood of adolescents perceiving that they had gained weight, respectively. Overall, it seemed as though paternal nurturing had the most positive effects on adolescents' health outcomes, compared with the effects of other parenting style dimensions.

For parental effects on children and adolescents' energy and nutrient intake, the MA parenting style was desirable for children but less desirable for adolescents. The FA style of parenting seemed to be desirable for children, even though it was positively associated with a higher intake of percent calories from carbohydrates, because such intake reflects lower percent calorie consumption from total fat. In fact, there was a negative correlation between percent caloric intake from carbohydrates and percent calories from total fat. Maternal nurturing was desirable for both children and adolescents**,** because it was associated with higher percent calories from carbohydrates in children's diets and lower total caloric and saturated fat intake in adolescents. Paternal nurturing was desirable for adolescents. Maternal control had mixed effects for adolescents because it was associated with lower caloric intake per kilogram body weight and lower percent of DRI for dietary fiber. Paternal control appeared to be undesirable for both children and adolescents because it was associated with greater percent calories from saturated fat in their diets and increased consumption of total sugar and cholesterol by children and decreased calories from carbohydrates and lower percent DRI for dietary fiber in adolescents' diets.

For parental effects on children and adolescents' physical outcomes, the MA parenting style and maternal nurturing appeared to be desirable in terms of most body measurements and BMI parameters in adolescents. While the BA style also appeared to be desirable for adolescents' BMI, the FA style of parenting had no association with adolescents' physical outcomes. Maternal control was undesirable because it was associated with adolescents' greater body fatness. In contrast, none of parenting styles or dimensions were associated with children's physical outcomes.

2.2. Male and Female Subjects' Health Outcomes

2.2.1. Self-Concept, Eating Behaviors, and Physical Activity Behaviors

The more authoritative the mothers were, the higher self-esteem males had. MA had no effect on males' eating behaviors, but it had a wide impact on males' physical activity behaviors including increased tendency for them to exercise regularly, to exercise hard, but also to engage in sedentary activities. In contrast, the MA style of parenting had no effect on females' physical activity behaviors. However, the more authoritative the mother's parenting style was, the more frequently females consumed snacks, and the less frequently females perceived that their mothers were concerned about them being overweight. With respect to the FA style of parenting, it was associated with less frequent snacking, less frequent sedentary activities, and higher self-esteem in male subjects. Females had higher self-esteem in conjunction with FA parenting. The more authoritative the fathers' parenting style was, the less frequently their daughters watched TV while eating dinner. The FA style of parenting had no effect on females' physical activity behaviors. Turning our attention to the BA parenting style, it had a positive effect on males' self-esteem, but the BA parenting style had no effect on male subjects' eating behaviors. The more authoritative both parents' style was, the more frequently males participated in both hard exercise and sedentary activities. The BA style was associated with females' more frequent TV watching during dinner, higher self-esteem, and decreased perception that their fathers were concerned about their daughters' weight. The BA style, however, had no effect on females' physical activity behaviors.

Males who experienced greater maternal nurturing tended to possess higher self-esteem but they participated in sedentary activities more frequently. Maternal nurturing had no effect on male subjects' eating behaviors. The more nurturing the mothers were, the less likely daughters perceived mothers' viewed their daughters as being overweight and the more likely these daughters participated in team sport activities. Like male subjects, female subjects' eating behaviors were not associated with the degree of mother's nurturing. Paternal nurturing had the strongest positive effect on males' self-esteem. Also, males tended to consume snacks less frequently and participate more frequently in sedentary activities if they perceived their fathers as nurturing. Females had higher self-esteem if they perceived their fathers were nurturing. Females were more likely to participate in team sport activities if their fathers employed greater nurturing, whereas paternal nurturing had no effect on female subjects' eating behaviors. Males were more likely to be currently dieting if their mothers used greater control, but male subjects' self-concept and physical activity behaviors were not associated with maternal control. Female subjects were more likely to perceive that their mothers were concerned about their being overweight, but less likely to perceive that they were gaining weight when their mothers used more control over these female children. Female subjects' eating and physical activity behaviors were not associated with maternal control. With respect to paternal control, it had no effect on male/female subjects' eating and physical activity behaviors and had no effects on males' self-concept. However, females had significantly lower self-esteem and they were more likely to perceive that their fathers were concerned about their daughters being overweight when fathers used greater control.

2.2.2. Energy and Nutrient Intake

The MA parenting style was associated with decreased consumption of total sugar and saturated fat in males and a greater percent of the DRI for dietary fiber in females' diets. The FA style did not predict males' energy and nutrient intake, but it predicted females' lower percent calories from saturated fat intake and increased consumption of total sugar. The BA style was associated with females' percent calorie intake from saturated fat; specifically the more this style of parenting was used, the lower females percent calories from fat.

Regarding the effects of parenting style dimensions, maternal nurturing had no effect on either male and female subjects' energy and nutrient intake. Maternal control was associated with a lower percent calorie intake from total fat in males. Paternal nurturing predicted males' increased consumption of calories from protein and females' decreased consumption of calories from protein. Paternal control predicted males' lower percent of DRI for fiber and greater percent calories from total fat, from saturated fats, and a greater amount of saturated fat consumed by females.

2.2.3. Physical Outcomes

Parenting style and dimensions did not predict females' physical outcomes. Paternal control was associated with males' shorter standing height and with a decreased tendency of being classified in the BMI “normal” category, but an increased tendency of falling into the BMI “above normal” category.

In summary, for parental effects on male and females’ self-concept and eating and activity behaviors, some findings highlighted gender difference in the associations between parenting behaviors and health outcomes in youth (9-15 year old). For parenting styles, it appeared that authoritative parenting style by mother, father, and both parents had widespread effects on males’ activity behaviors, but no effect on females’ activity behaviors. An interesting finding for the association between parenting style and child’s self-esteem is that the FA parenting style was the most important predictor for male subjects’ self-esteem, whereas the MA style was not associated with female subjects’ self-esteem. This may suggest that authoritativeness by a parent of the same gender matters for male subjects’ self-esteem, but the ‘same gender’ effect is not present in female subjects. Parental authoritativeness turned out to have some undesirable effects on males based on its positive association with the tendency of males to increase sedentary activities. Overall, the FA parenting style seemed to be the most desirable parenting style for male subjects’ self-concept and eating behaviors. The MA and BA parenting styles had mixed effects for males’ physical activity behaviors, given that not only physical activities but also sedentary activities were positively associated with those parenting styles. For females’ health outcomes, the MA style was undesirable for females’ eating behaviors, but it was desirable for females’ self-concept. By contrast, the FA and BA parenting styles were desirable for females’ eating behaviors and self-concept. Overall, the BA parenting style seemed to result in better health outcomes for female subjects, and fathers' authoritativeness seemed to be more important than mother's for these subjects.

For relationships between parenting style dimensions and health outcomes, parents' nurturing, regardless of parent's gender, was desirable for males' greater self-esteem, but undesirable for males' physical activity behaviors. Neither maternal nurturing nor maternal control had any effect on female subjects' self-esteem. Paternal control had the most detrimental effect on females' self-esteem, but paternal nurturing had positive effects on females' self-esteem. These findings suggest once again that females' self-esteem was not affected by maternal parenting style dimensions, but instead by paternal nurturing and control. While none of the parenting styles and parenting style dimensions was a significant predictor of male subjects' body image, maternal nurturing and parental control appeared to be significant predictors of females' perception that their parents were concerned about their weight. This may imply that perceived parenting behaviors are more likely to be associated with females' body perception, but not with males'. Maternal control was a positive predictor of males' increased tendency to currently be on a weight-loss diet. The number of males who engaged in such a diet was relatively smaller than their female counterparts. Females' eating behaviors were not predicted by any of the perceived parenting style dimensions. Paternal control had no effect on any of the three types of males' health outcomes. By contrast, paternal control was highly detrimental to females' physical activity behaviors and self-concept. Overall, males' health outcomes benefited the most from perceived paternal nurturing, given its desirable effects on decreased snacking and higher self-esteem. Females' benefited from the perception of more nurturing from both mother and father in that they led to better outcomes in females' self-concept and physical activity behaviors.

It needs to be mentioned that parenting behaviors, measured by parenting styles and parenting style dimensions, appeared to have the most associations with males' physical activity behaviors and females' self-concept, considering the total number of associations found between parenting behaviors and health outcomes. This may support the traditional belief that parents are more likely to be involved in physical activities such as exercise with their male children than their female children, whereas females are more likely to be engaged in body dissatisfaction or weight-related concerns through the relationships with significant others such as parents.

Turing to parental effects on males'/females' energy and nutrient intake, the MA style was desirable for both male and female subjects. The FA style appeared to have mixed effects on females' energy and nutrient intake, given that decreased caloric intake from saturated fat and greater consumption of total sugar were both more likely. The BA parenting style had no effects on either male and female subjects' energy and nutrient intake. Paternal nurturing and maternal control were desirable, but paternal control was detrimental to males' energy and nutrient intake. In females, paternal control had undesirable consequences for females' energy and fat intake.

For parental effects on male and females' physical outcomes, paternal control turned out to be undesirable for males' height and BMI percentile, whereas none of parenting styles and dimensions predicted females' physical outcomes.

3. Effects of Family Meal Behaviors on Health Outcomes

3.1. Older Children's and Young Adolescents' Health Outcomes

3.1.1. Self-Concept, Eating Behaviors, and Physical Activity Behaviors

Children's self-esteem and body image are more highly associated with family meal behaviors, compared with their association with other aspects of health outcomes. Children's participation in family breakfast was positively associated with their perception of their activity level, whereas the more frequently children participated in family dinner away from home was positively associated with children's perception that they were gaining weight. The degree to which children perceived that dinner was a family ritual had no effect on children's eating behaviors, but it had significant effects on children's physical activity, self-esteem, and body image. Parental criticism of their children's eating habits was positively associated with those children's perception that their parents were concerned about their weight. In addition, paternal criticism of children's eating habits was a negative predictor of children's self-esteem. Although frequency of skipping breakfast was the most important predictor of children's energy and nutrient intake, none of family meal behaviors had a direct association with children's breakfast skipping behavior. The frequency with which children participated in family lunch and family dinner were negatively associated with children's tendency to currently be on a dieting and snacking, respectively. The frequency with which children participated in family dinner away from home and their perception dinner was a family ritual were two important predictors of children's tendency to participate in team sports.

The lack of parental food pressure had no effect on children's health outcomes, and none of family meal behaviors predicted children's sedentary activity behaviors.

In adolescents, participation in family dinner and the degree to which parents provided them with their favorite foods were the two family meal behaviors that positively predicted adolescents' self-esteem. Parent's criticism of children's eating habits provided another 'same gender effect.' Here fathers' criticism led to their son's perception that their fathers believed them to be overweight; a similar relationship between these two variables was found in the case of mother and daughters. Adolescents' perception that family dinner was a ritual was the most important predictor of adolescents' eating behaviors, in terms of less frequent skipping breakfast and snacking behaviors. Lack of parents' food pressure was associated with frequent TV watching while eating dinner on the part of adolescents. Mother's criticism of adolescents' eating habits was associated with the frequency with which adolescents snacked. The more frequently adolescents participated in family lunch was associated with decreased frequency of hard exercise in the adolescents. Lack of parents' food pressure and parents' provision of the adolescents' favorite foods was positively related to adolescent sedentary activities. Overall, the frequency with which adolescents participated in family lunch and in family dinner and the stronger their perception that dinner was a family ritual appeared to be desirable. However, the lack of parents' food pressure, frequency of mother's criticism of adolescents' eating habits, and frequency of father's criticism of the adolescents' eating habits turned out to be undesirable, whereas the frequency of eating breakfast with family and dinner with family away from home has no effect on the three aspects of adolescents' health outcomes.

With respect to the relationships between family meal behaviors and subjects' self-concept, eating behaviors, and physical activity behaviors, some similarities emerged between children and adolescents. None of family meal behaviors predicted children's or adolescents' tendency to regularly exercise or their perception they were overweight. Frequent parental criticism of their adolescents' eating habits effect on parents concern their child was overweight that depended on gender. Mothers who were critical of their daughters' eating habits were more likely to be concerned about their daughters eating habits; the same association was seen between fathers' criticism and their perception their son's were overweight. In addition, some associations were only significant for either children or adolescents, but not both. Frequent participation in family breakfast was a significant predictor of children's perception of their activity level, but this relationship was not observed among the adolescents in the study. Frequent participation in family lunch was negatively associated with adolescents' frequency of hard exercise, but it had no effect on children's activity behaviors. Participation in family meals such as lunch and dinner by children was associated with children's eating behaviors, but similar association were not found among the adolescents. None of children's health outcomes was explained by the lack of parents' food pressure, whereas participation in family breakfast or family dinner away from home was not associated with adolescents' health outcomes. Children's self-esteem was associated with their perception that dinner was a family ritual and with their fathers' criticism of their eating habits. By contrast, their participation in family dinner and their parents' provision of their favorite foods were positive predictors of adolescents' self-esteem. Family meal behaviors predicted adolescents' sedentary activities, but the same was not found among their younger counterparts.

3.1.2. Energy and Nutrient Intake

In children, the frequency with which they participated in family lunch was negatively associated with the percent calorie intake from carbohydrates, positively associated with consumption of sodium, cholesterol, and percent of the DRI for iron in those children's diets. The lack of parental food pressure on children was negatively associated with their percent calories from protein, but positively associated with amount of sodium they consumed. The more frequently parents provided children's favorite foods, the lower percent calories from saturated fat they consumed. Unlike the generally desirable effects of the perception that dinner was a family ritual had on children' health outcomes, children's consumption of cholesterol tended to be higher as children more strongly perceived family dinner as a ritual.

In adolescents, lack of parental food pressure was negatively associated with total calorie intake, calorie consumption per kilogram body weight, consumption of sodium, cholesterol, and saturated fat, all of which can be considered to be desirable outcomes. Also, lack of food pressure from parents was negatively associated percent DRI for several nutrients including calcium, iron, folate, and vitamin A, all of which are undesirable nutritional outcomes given each nutrient's health-related significance. Perception of dinner as a family ritual was also negatively associated with total calorie consumption. The frequency with which adolescents participated in family lunch predicted their percent calories from total fat; the more they participated, the greater the percentage of calories from total fat in their diets. The frequency with which adolescents participated in family dinner eaten away from home was negatively associated with percent of the DRI for dietary fiber in their diets.

In summary, frequent participation in family lunch appeared to be largely detrimental for both children and adolescents in terms of their energy and nutrient intake. Particular attention needs to be paid to the effect of lack of parental food pressure on the study subjects' energy and nutrient intake. Children consumed more sodium but lower calories from protein if their parents put less pressure on their eating. A number of adolescents' energy and nutrient intake variables tended to be associated with lack of parental food pressure. However, an attempt to generalize the effects of this lack of food pressure from parents on adolescents' energy and nutrient intake is challenging, due to its mixed effects. Increased frequency eating dinner with away from home appeared to be detrimental to adolescents' dietary fiber consumption; they consumed less under this circumstance. Provision of children's favorite foods by parents was beneficial to children in the sense that they consumed less energy from saturated fat.

3.1.3. Physical Outcomes

Relatively few associations were found between family meal behaviors and physical outcomes. Children tended to have a BMI in the "at risk of overweight" category if they participated in family lunch less frequently. Unexpectedly, children's perception that dinner was a family ritual was positively associated with their tendency to have a BMI in the “at risk of overweight” category. In adolescents, their perception their fathers were critical of their eating habits was positively associated with their waist circumference.

3.2. Male and Female Subjects’ Health Outcomes

3.2.1. Self-Concept, Eating Behaviors, and Physical Activity Behaviors

In male subjects, the more strongly males perceived dinner to be a family ritual, the more likely males had higher self-esteem, higher activity levels, but lower perceived weight gain. Also, frequency of participation in family dinner and parents’ provision of their favorite foods were positive predictors of males’ self-esteem. Paternal criticism of males’ eating habits was associated with perceived paternal concern about their son’s being overweight, at the same time, males’ participation in family lunch was negatively associated with both maternal and paternal concerns’ about their weight. Regarding males’ eating behaviors, the more frequently males ate breakfast with their families, the less frequently they skipped breakfast and the more frequently they consumed vitamin-mineral supplements. Also, lack of parents’ food pressure was positively associated with males’ skipping breakfast. The more frequently males ate lunch with their families, the less likely those males dieted. The more frequently males participated in family dinner, the less frequently they consumed snacks. As males ate dinner with family away from home more often, the less likely they dieted. The more frequently mothers criticized their sons’ eating habits, the more likely males were to watch TV while eating dinner. The greater criticism fathers expressed about males’ eating habits, the more frequently males skipped breakfast, currently dieted, but the less frequently they consumed vitamin-mineral supplements. Turning to males' physical activity behaviors, the more strongly males' perceived dinner as a family ritual, the more likely they participated in regular exercise and team sports.

Overall, frequent participation in family meals, stronger perception of dinner as a family ritual, and parents' frequent provision of child's favorite foods appeared to have positive effects on male subjects' health outcomes, where perception of family dinner as a ritual was the only predictor of males' activity behaviors. Lack of food pressure by parents, and mother and father's frequent criticism of males' eating habits were undesirable for males' eating behaviors and self-concept. In particular, frequent criticism of males' eating habits by their fathers had the strongest effects on males' poor eating behaviors.

In female subjects, females' participation in family dinner was positively associated with their higher self-esteem. Perception that dinner was a family ritual and parent's provision of the daughters' favorite foods were the negative predictors of both maternal and paternal concern about their daughters' weight. Turning next to females' eating behaviors, females were less likely to be currently dieting if they participated in family breakfast more frequently. The frequency of participation in family dinner and parents' provision of their daughters' favorite foods were negative predictors of frequency of daughters skipping breakfast. The perception of dinner as a family ritual was negatively associated with, but paternal criticism of their daughters' eating habits was positively associated with females' frequency of TV watching while eating dinner. Lack of pressure by parents' on females' eating and both maternal and paternal criticism of females' eating habits was positively related to the frequency females snacked. Regarding females' physical activity behaviors, females tended to participate in sedentary activities more frequently if their parents provided their favorite foods less frequently and if their mothers criticized their eating habits more frequently.

As with the findings for the male subjects, family meal behaviors had a greater number of effects on females' eating behaviors and self-concept than they did on females' physical activity behaviors. The frequency of participation in family breakfast, frequency of participation in family dinner, perception that dinner was a family ritual, and parents' provision of females' favorite foods had desirable effects, but lack of food pressure by parents and both maternal and paternal criticism of females' eating habits had undesirable effects. However, neither females' participation in family lunch nor in family dinner away from home were associated with females' health outcomes.

There were some similarities and dissimilarities between the two genders with respect to the relationships between family meal behaviors and three aspects of the health outcomes. The frequency with which study subjects participated in family dinner was a common predictor of self-esteem in both male and female subjects. Also, males' self-esteem was predicted by perception that dinner was a family ritual and by parents' provision of males' favorite foods. Lack of food pressure by parents had negative effects on both male and female subjects' eating behaviors: males more likely skipping breakfast and females' more likely snacking. Paternal criticism of their children's/adolescents' eating habits had undesirable effects on both male and female subjects' eating behaviors. None of the family meal behaviors predicted the frequency with which males and females engaged in hard exercise and perceived themselves to be overweight. Males' perception that dinner was a family ritual was the most important predictor of males' health outcomes, especially their physical activity behaviors and self-concept, whereas parents provision of females' favorite foods appeared to be the most important predictor of females' health outcomes. The frequency with which males ate lunch with family and the frequency with which they participated in family dinner eaten away from home had positive effects on males' eating behaviors, but these two behaviors had no effect on females' eating behaviors. Maternal criticism of males' eating habits had a positive effect on males' eating behaviors, but a negative effect on females' eating behaviors; the more mothers criticized the more likely males watched TV during dinner and the more likely females snacked. Positive associations were found between both maternal and paternal criticism of males' eating habits and males' perception that both their mothers and fathers were concerned about their male offspring's weight, whereas no such association was found for female subjects.

3.2.2. Energy and Nutrient Intake

In male subjects, the perception that dinner was a family ritual was positively associated with their percent caloric intake from protein. The more frequently parents provided their male children/adolescents with their favorite foods, the fewer calories per kilogram body weight that these males consumed. The frequency of males' participation in family dinner eaten away from home was negatively associated with percent of the DRI for calcium and percent DRI for iron in their diets.

In female subjects, the frequency with which these females participated in family lunch was positively associated with their total calorie and calorie intake per kilogram body weight, percent calorie from total fat, percent DRI for iron, percent DRI for dietary fiber, and consumption of sodium, cholesterol, and saturated fat. Lack of parental food pressure predicted a lower percent caloric intake from protein and a greater amount of trans fat consumption by females. The frequency with which females participated in family dinners eaten away from home was negatively associated with percent DRI for dietary fiber in females' diets. Mothers' criticism of their daughters' eating habits was positively associated with daughters' percent DRI for calcium, whereas fathers' criticism of their daughters' eating habits was positively associated with percent calorie from total fat, but negatively associated with the amount of trans fat they consumed. In summary, lack of parental food pressure, frequency of participation in family dinner eaten away from home turned out to be undesirable, whereas mothers' criticism of their daughters' eating habits was desirable. Father's criticism of daughters' eating habits and frequency with which daughters participated in family lunch appeared to be largely detrimental, but some desirable effects were also found.

Taken together, frequency of participation in family dinner eaten away from home was detrimental for both male and female subjects' energy and nutrient intake.

3.2.3. Physical Outcomes

In males, their frequency of participation in family lunch was negatively associated with their BMI and subscapular skinfold. Also, their frequency of participating in family lunch decreased their tendency of having a BMI in the "overweight" category. The perception that dinner was a family ritual was positively associated with the thicknesses of both triceps and subscapular skinfolds. In female offspring, parents' provision of their favorite foods was negatively associated with their triceps skinfold.

4. Mediation Effects of Family Meal Behaviors

4.1. Examination of Causal Relationships among Variables

Direct associations between parenting behaviors and five aspects of health outcomes were examined by multiple regression analysis (both linear and non-linear). As was discussed previously, some parenting behavior appeared to have inconsistent effects on child's health outcomes, therefore, the study uncovered the need to further investigate as to whether some other factors intervene in the association between a certain parenting behavior and a given health outcome. Multiple regression analysis revealed several common findings across study groups: 1) parenting behaviors had strong associations with family meal behaviors such as frequency of family meals, perceptions that dinner was a family ritual, lack of parents' food pressure, parents' provision of children's favorite foods, and parents' criticism of children's eating, 2) family meal behaviors had significant associations with children's/adolescents' eating behaviors and self-concept and somewhat fewer associations with physical activity behaviors, 3) children's/adolescents' energy and nutrient intake and physical outcomes were best predicted by the children's/adolescents' eating behaviors such as breakfast skipping, snacking, food supplements intake, TV watching over meals, and dieting.

Consequently, it seemed to be useful to investigate family meal behaviors as possible mediators in path models in which relationships between parenting behaviors and three dimensions of children's/adolescents' health outcomes are studied. Because energy and nutrient intake are only a snapshot of children's/adolescents' nutritional outcome rather than a representative of usual intake, whereas child's eating behavior may better represent their dietary habits which can be linked to their usual dietary intake, exclusion of energy and nutrient intake from the path model analysis was further supported. In addition, because children's/adolescents' physical outcomes are one aspect of health outcomes that may be better examined in a longitudinal analysis, exclusion of this particular health outcome from the path model analysis seemed meaningful given that the present study is limited to cross-sectional analyses. In addition, fewer associations between family meal behaviors and physical outcomes was an additional reason for not including child's physical outcomes in path analysis because significant associations between mediator(s) and dependent variable(s) is one of the most important conditions for using path analysis.

The variables studied in path analysis are as follows: independent variables were parenting style dimensions including mother's nurturing, father's nurturing, mother's control, and father's control; dependent variables were child's health outcome variables including eating behaviors (frequency of skipping breakfast, frequency of snacking, frequency of TV watching while eating dinner), physical activity behaviors (frequency of hard exercise, frequency of light exercise, frequency of sedentary activities), and self-concept (self-esteem, perception of mother's concern about their child/adolescent being overweight, perception of father's concern about their child being overweight); intervening variables (mediators) were family meal behaviors including frequency child/adolescent participation in family breakfast, frequency child/adolescent participation in family lunch, frequency of child/adolescent participating in family dinner, frequency child/adolescent participation in family dinner away from home, perception that dinner was a family ritual, lack of food pressure from parents, parents provision of the child's/adolescent's favorite foods, mother's criticism of child's eating, and father's criticism of child's eating. Summary of the path analysis with child's self-concept as the dependent variable will be followed by summaries for eating behaviors and physical activity behaviors across all four study groups (children, adolescents, males, and females). As with multiple regression analysis, only statistically significant direct and indirect effects (p value $\leq .05$) are reported here (see Appendix F for Figures 7-1 to 7-19 and Tables 7-80 to 7-89).

4.2. Path Models for Parenting Style Dimensions, Family Meal Behaviors, and Self-Concept

4.2.1. Children

For self-esteem, all four parenting style dimensions appeared to have both direct and indirect effects on children's self-esteem (Figure 7-1). The more nurturing the mothers and fathers used with their children, the greater self-esteem the children had; the more control the parents used over their children, the lower self-esteem the children had. Parental nurturing was mediated via children's perception of family dinner ritual, which in turn, was positively associated with children's self-esteem. This means the more nurturing the parents, the more children perceived family dinner to be a ritual, the higher their self-esteem. Parental control was mediated via children's perception that their fathers criticized their eating habits, which in turn lowered children's self-esteem. The greater the level of parental control, the more likely children perceived their fathers were critical of their eating habits, which in turn, increased children's chances of low self-esteem. Regarding children's perception that their mothers were concerned about them being overweight, maternal nurturing had both direct and indirect effects on this concern of their mothers (Figure 7-2). Paternal nurturing had only indirect effects, whereas parental control had only direct effects on mother's concern about their child being overweight. As with the findings regarding associations between parenting style dimensions and children's self-esteem, parental nurturing had opposite effects on children's perception their mothers were concerned about their children being overweight, compared with the effects of parental control on this perception. The more nurturing the mothers used with their children, the less frequently the children perceived that their mothers were concerned about them being overweight, and the more control the parents used in dealing with their children, the more frequently the children perceived their mothers were concerned about them being overweight. The indirect effect here means that the more nurturing the parents used with their children, the less frequently the children perceived their mothers were concerned about them being overweight, and this association was mediated by children's perception that dinner was a family ritual. In other words, the more nurturing the parents, the more children saw dinner as a family ritual, and such perceptions by children's decreased the chances of their mothers being concerned about them being overweight. In the case of children's perception that fathers were concerned about them being overweight, relationships between parenting style dimensions and perception of father's concern about their child being overweight turned out to be very similar to those results found for mother's concern about their child being overweight (Figure 7-3). Maternal nurturing had both direct and indirect effects on father's concern about his child being overweight. Paternal nurturing had only indirect effects, whereas parental control had only direct effects on father's concern about his child being overweight. Parental nurturing predicted father's concern about his child being overweight through children's perception that dinner was a family ritual. In other words the greater the parental nurturing, the more likely children perceived that dinner was a family ritual, which in turn, was negatively associated with fathers' concern about their children being overweight.

Path analysis revealed high associations between mother's concern and father's concern about their children being overweight, given that parental nurturing was negatively associated with mothers' and fathers' concern about children being overweight via children's perception that dinner was a family ritual. Overall, maternal nurturing and parental control were strong predictors of children's self-esteem and body image, whereas paternal nurturing was a less strong predictor of children's body images as compared with other effects in terms of total standardized path coefficients. In summary, children seemed to benefit from receiving greater nurturing from both parents in terms of their self-esteem and body images, whereas greater parental control was undesirable due to its association with lower self-esteem in children and the more frequent perception that their parents were concerned about these children being overweight. Children's perception that dinner was a family ritual played a positive role in children's self-esteem and body image. In other words, the greater children's perception that family dinner was a ritual led to positive effects of parental nurturing on children's self-esteem and body image. Likewise, father's criticism about his children's eating habits and father's control were negatively related on children's self-esteem.

4.2.2. Adolescents

Regarding self-esteem, father's nurturing was the only parenting behavior that had a direct effect on adolescents' self-esteem. This means the greater father's nurturing, the higher adolescents' self-esteem tended to be. In the case of adolescents' perception their mothers were concerned that they were overweight, a direct relationship was found between father's nurturing and mothers' concern about their children being overweight. The greater fathers' nurturing, the less concerned mothers were about their children being overweight.

Unlike the findings of parental effects on children's self-esteem and body image, relatively small associations were found between parenting style dimensions and adolescents' self-concept. Also, none of family meal behaviors mediated parental effects on adolescents' self-concept. Fathers' nurturing was the only predictor of adolescents' self-concept, given that the more nurturing the fathers were, the more likely adolescents had higher self-esteem and body image.

In summary, path analysis revealed the differential effects of parent variables on the self-concept of children compared with adolescents. All four parenting style dimensions were significant predictors of children's self-concept, but only father's nurturing predicted adolescents' self-esteem and body image. Family meal behaviors turned out to be important mediators for the effects of parenting on children's self-esteem and body images, whereas none of family meal behaviors mediated the effect of father's nurturing on adolescents' self-concept. In conclusion, parental nurturing was desirable, and parental control was undesirable for children, whereas paternal nurturing was desirable for adolescents, and none of the other parenting style dimensions had effects on adolescents in terms of adolescents' self-esteem and their perception that their parents were concerned about their being overweight.

4.2.3. Male Subjects

In terms of self-esteem, father's nurturing and mother's nurturing predicted male subjects' self-esteem both directly and indirectly (Figure 7-4). Males' perception that dinner is a family ritual mediated the effects of both mother's and father's nurturing on males' self-esteem. The greater the nurturing by parents, the more likely the males perceived family dinners to be a ritual, and the more adolescents perceived family dinners to be rituals, the greater self-esteem the males tended to have. Parental control was not a significant predictor for males' self-esteem either directly or indirectly. Regarding the perception that their mothers were concerned about them being overweight, mother's nurturing and father's nurturing indirectly predicted mothers' weight concerns in reference to males' weight via frequent family lunch (Figure 7-5). That means the more nurturing parents were towards their male children, the more frequently these males participated in family lunch meals, and the less likely the males perceived their mothers were concerned about their being overweight. Parental control did not predict males' perception that their mothers were concerned about them being overweigh. In the case of males' perception that their fathers were concerned about them being overweight, similar to the relationships found between mothers' concern about their male offspring being overweight, the same kind of indirect effects were also found for father's concern about their male offspring being overweight (Figure 7-6). Mother's nurturing and father's nurturing indirectly predicted father's concern about their male youngsters being overweight via participation in family lunch. The more nurturing the parents, the more frequently the males ate lunch with family, and the more males did so, the less likely males perceived their fathers were worried about their being overweight. There was no effect of parental control on males' perception that their fathers were concerned about them being overweight.

In summary, parental nurturing appeared to be desirable for males' self-esteem and males' perception that their parents worried about them being overweight. Parental nurturing had both direct and indirect positive effects on males' self-esteem, whereas there was no direct effect of parental nurturing on males' perception that their parents were concerned about them being overweight. Several family meal behaviors mediated the relationships between parenting style dimensions and males' self-concept in different manners. Males' perception that dinner was a family ritual increased the degree of the positive effects of parental nurturing on males' self-esteem. Greater frequency of males' family lunch participation acted as an important mediator between parental nurturing and males' perception that their fathers' were concerned about them being overweight, a relationship which was initially non-significant. Parental control turned out to have no effect on males' self-concept either directly or indirectly. Overall, parental nurturing had greater effects on males' self-esteem than did males' perception that their parents were concerned about them being overweight, based on a comparison of the magnitudes of total path coefficients.

4.2.4. Female Subjects

Beginning with self esteem, father's nurturing directly predicted female subjects' self-esteem. As was hypothesized, the greater fathers' nurturing, the more likely females had greater self-esteem. Also, father's control was a significant predictor for females' self-esteem. The greater fathers' control, the poorer females' self-esteem. The negative effect of father's control was stronger than the positive effect of father's nurturing on females' self-esteem. No significant indirect effect was found for the relationships between parenting style dimensions and females' self-esteem. Interestingly, females' self-esteem was not predicted by the parenting style of their same gender parent: mother's nurturing and control were not associated with females' self-esteem. Mother's nurturing was associated with mother's concern about their female offspring being overweight, both directly and indirectly (Figure 7-7). The perception that dinner was a family ritual was the mediator for this relationship. The greater mothers' nurturing, the more likely their children perceived dinner as a family ritual, and the more children perceived dinner as a ritual, the less likely their mothers worried their children's weight. Mother's control directly predicted mother's concern about child overweight. The greater mothers' control, the more likely mothers' were concerned about their children's weight. Father's nurturing also indirectly predicted mother's concern about their children being overweight via females' perception that dinner was a family ritual. Turning to fathers concerns about their children's weight, father's control had the strongest relationship with females' perception that their fathers worried about their being overweight (Figure 7-8). The greater the control, the more likely fathers were concerned about their females offspring's' weight. Like the findings regarding parental effects on females' perception that their mothers worried about them being overweight, mother's nurturing and father's nurturing indirectly predicted father's concern about their female offspring being overweight via females' perception that dinner was a family ritual.

In summary, mother's parenting behaviors, measured by maternal nurturing and control, were not associated with females' self-esteem, but paternal nurturing and control were significant predictors. Both maternal and paternal parenting behaviors predicted females' body images measured by the perception their parents were concerned about their daughters being overweight. In general, parental nurturing was desirable, and parental control was undesirable for females' self-concept, based on parental effects on females' self-esteem and body images.

Findings from the path analysis demonstrated some similarities between the two genders. There seemed to be strong correlations between mother's concern and father's concern about their children/adolescents being overweight, in that both parents' became more concerned about their children's/adolescents being overweight if their parents were less nurturing of male and female subjects. It is meaningful to discuss gender dissimilarities when the relationships between parental behaviors and children's/adolescents' self-concepts are examined. First, males' self-esteem was predicted by parental nurturing, but not by parental control, whereas females' self-esteem was predicted by paternal nurturing and control, but not by any of the maternal behaviors. Second, parenting behaviors had both direct and indirect effects on males' self-esteem, whereas females' self-esteem was only directly predicted by father's nurturing and control. This means family meal behaviors mediated the parental effect on males' self-esteem, but not on their females' counterparts. Third, there were several mediators involved in predicting males' self-concept, including the perception that dinner was a family ritual and the frequency with which they participated in family lunch. By contrast, females' perception of dinner as a family ritual was the only mediator for females' self-concept.

4.3. Path Models for Parenting Style Dimensions, Family Meal Behaviors, and Eating Behaviors

4.3.1. Adolescents

In terms of the frequency that adolescents skipped breakfast, mother's nurturing and father's nurturing indirectly predicted this breakfast skipping via adolescents' perception that dinner was a family ritual (Figure 7-9). The greater mothers' and fathers' nurturing, more likely adolescents perceived dinner as a family ritual, which in turn was associated with a decrease in breakfast skipping by those adolescents. Regarding the frequency of snacking, both direct and indirect associations between parenting style dimensions and adolescents' frequency of snacking were found (Figure

7-10). Greater degree of maternal and paternal nurturing indirectly predicted consumption of snacks via adolescents' perception that dinner was a family ritual, which in turn decreased the frequency of their snacking. Greater mother's control was directly associated with less frequent consumption of snacks by adolescents. It appeared that mother's control had the greater effect on adolescents' snack consumption when compared with parental nurturing in terms of magnitudes of their standardized path coefficients. Overall, adolescents' perception that dinner was a family ritual seemed to play a beneficial role in their eating behaviors, such as decreased frequency of skipping breakfast and snacking. In terms of the frequency adolescents' watched TV while eating dinner, there were no direct effects of parenting style dimensions on adolescents' TV watching while eating dinner (Figure 7-11). Mother's control indirectly predicted adolescents' frequency of TV watching during dinner via food pressure they experienced from parents. That is, the more control the mothers exerted over their adolescents, the more food pressure the adolescents perceived from their parents, and greater parents' food pressure, in turn, was associated with a greater frequency of TV watching while eating dinner.

Overall, parental nurturing and maternal control were desirable for adolescents' eating behaviors, including decreased frequency of breakfast skipping, snacking, and TV watching while eating dinner. Father's control had no effect on adolescents' eating behaviors. Path analysis results uncovered distinguishable differences in parental effects on the eating behaviors when comparing children and adolescents. Children's eating behaviors had no association with parenting style dimensions directly or indirectly.

However, adolescents' eating behaviors had both direct and indirect associations with parenting style dimensions. In addition, not only mothers' nurturing but also mothers' control turned out to be beneficial for adolescents' eating behaviors, along with the desirable effect of fathers' nurturing on adolescents snacking – the greater fathers' nurturing, lower the frequency of adolescents' snacking. None of parenting style dimensions predicted children's eating behaviors directly or indirectly via family meal behaviors.

4.3.2. Male Subjects

Turning to skipping breakfast, parenting behaviors did not directly predict the frequency that males skipped breakfast (Figure 7-12). Mothers' control over their male offspring indirectly predicted the frequency of skipping breakfast via food pressure from parents, and a lack of such food pressure from parents, in turn, was associated with an increased frequency of skipping breakfast. Fathers' nurturing directly and indirectly predicted decreased frequency of snacking by males (Figure 7-13). In the indirect pathway, the frequency of participation in family dinner by male subjects functioned as a mediator between father's nurturing and males' frequency of snacking. The more nurturing father used in dealing with their male children, the more frequently those males ate dinner with family, and the less likely those males consumed snacks. Greater mothers' control indirectly predicted males' frequency TV watching during dinner (Figure 7-14). The more control mothers used over their male children, the more frequently the mothers criticized their male offspring's eating habits, and the less likely those males watched TV while eating dinner.

In summary, father's nurturing had both direct and indirect positive effects on males' consumption of snacks. It was noticeable that mothers' control had positive effects on males' eating behaviors, given that mothers' control decreased the frequency of skipping breakfast as well as TV watching while eating dinner. Moreover, these two eating behaviors turned out to have the most impacts on males' energy and nutrient intake. The results of path analysis suggest that male subjects benefited from the perception that their fathers engaged in nurturing and their mothers engaged in control, given that mother's control and father's nurturing predicted that male offspring would skip breakfast, watch TV during dinner, and snack less often, respectively. Interestingly, neither maternal nurturing nor paternal control had any effect on males' eating behaviors, either directly or indirectly.

4.3.3. Female Subjects

In the case of skipping breakfast, parenting style dimensions did not directly predict females' breakfast skipping (Figure 7-15). Mother's degree of nurturing indirectly decreased females' frequency of skipping breakfast via increasing the degree to which parents provided favorite foods to their female offspring, which in turn predicted a decreased frequency of skipping breakfast. In addition, mother's nurturing appeared to predict females' frequency of breakfast skipping via another mediator, the perception of dinner as a family ritual. Mother's nurturing had positive association with females' perception that a family dinner ritual took place in their homes, which in turn had a negative association with frequency that females skipped breakfast. Like mother's nurturing, father's nurturing indirectly predicted females' frequency of skipping breakfast, and this was mediated by the perception that dinner was a family ritual. Regarding the frequency of snacking, greater mother's nurturing indirectly increased frequency of snacking via the lack of food pressure by parents (Figure 7-16). This means that the more nurturing mothers did of their female offspring, the less likely parents exerted food pressure, and the less food pressure the parents used, the more frequently the females consumed snacks. Turning to the frequency with which females watched TV while eating dinner, mother's nurturing and father's nurturing decreased the frequency of TV watching during dinner via increased females youth's perception that family dinner meals are family rituals, which, in turn was associated with less frequent TV watching by females while eating dinner (Figure 7-17).

In summary, neither mother's control nor father's control had any effect on females' eating behaviors. Mother's nurturing and father's nurturing appeared to be desirable for females' eating behaviors, given that females skipped breakfast less often as well as watched TV less often while eating dinner if they perceived a greater amount of parental nurturing. Nonetheless, mother's nurturing was positively associated with increased snack consumption. Considering the negative effects of snacking that appeared on the energy and nutrient intake profile, such as decreased calorie intake from protein and increased consumption of total sugar, mother's nurturing needs to be interpreted as having mixed effects on females' eating behavioral outcomes.

Overall, the path analysis for the relationships between parenting and eating behaviors revealed both similarities and dissimilarities in the two genders. Fathers' control did not predict any eating behaviors for either male or female subjects. Mothers' nurturing appeared to have mixed effects on females' eating behaviors, given that greater the nurturing performed by mothers, the less frequent the skipping of breakfast, the less frequent the TV watching during dinner, and more frequent the snacking by female offspring, whereas mother's nurturing had no effect on males' eating behaviors. It needs to be pointed out that females' TV watching during dinner seemed to have mixed effects on energy and nutrient intake, given that frequent TV watching during dinner led to increased percent calories from protein and increased cholesterol consumption, whereas the effect of TV watching during dinner was generally undesirable for male subjects, given its effects on decreased percent DRI for folate and increased sodium and cholesterol intake. Thus, interpretation of the effect of mothers' nurturing on females' frequency of TV watching during dinner needs to be done with caution because the frequency of females' TV watching while eating dinner' effects on their energy and nutrient intake found in this study are not consistent with other's findings on this issue. Mothers' control appeared to have desirable effects on males' eating behaviors, given that the greater mothers' control, the less frequently males skipped breakfast and watched TV during dinner. By contrast, females' eating behaviors had no association with mothers' control. Fathers' nurturing had desirable effects on males' snack consumption directly as well as indirectly via the frequency with which they participated in family dinner, whereas fathers' nurturing seemed to have mixed effects on females' eating behaviors based on its association with the frequency of skipping breakfast and the frequency of TV watching while during dinner. Again, the mixed effect of frequent TV watching on nutrient intake by female subjects needs to be recalled. Fathers' control had no effects on the three important eating behaviors, including skipping breakfast, snacking, and TV watching during dinner for both male and female subjects. Overall, among the most important findings from the path analysis with respect to parental effects on male and female subjects' eating behaviors include: females' skipping breakfast less frequently was more likely with greater nurturing by their mothers, whereas males' breakfast skipping was predicted by mothers' control. Males skipped breakfast less frequently if their mothers were controlling. Also, father's nurturing was an important predictor of males' frequency of snacking, but father's nurturing had no effect on females' snacking; instead, paternal nurturing appeared to have effects on females' breakfast eating and TV watching during dinner. Mother's nurturing had a number of effects on females' eating behaviors, whereas their male counterparts' eating behaviors were not predicted by maternal nurturing. These results suggest that it may be more effective for mothers to use more nurturing of their female children and to use more control over their male children. Paternal nurturing should be greatly encouraged in the case of male offspring due to its beneficial effect on less frequent snack consumption by males. Likewise, paternal nurturing is also desirable for females' eating behaviors, given its association with less frequent breakfast skipping and less frequent TV watching during dinner. However, future research should take into account the associations between TV watching during dinner and energy and nutrient intake. Parental control, regardless of parents' gender, did not have any effects on females' eating behaviors.

Regarding the effects of particular mediators on male and female subjects' eating behaviors, lack of food pressure by parents was a common mediator for both male and female subjects' eating behaviors. In addition, frequency of participation in family dinner and mothers' and fathers' criticism of their offspring's eating habits were significant mediators for males, whereas perception of that dinner was a family ritual and parents provision of their offspring's favorite foods were important mediators for females' eating behaviors. It appeared that male and female subjects' perception of lack of food pressure by their parents was not associated with paternal parenting behavior but was with maternal parenting. Mothers who used greater control also more likely used greater food pressure, given that males perceived greater maternal food pressure in conjunction with greater maternal control, and that females perceived less food pressure if they perceived that their mothers were more nurturing. In summary, lack of food pressure from parents was undesirable for both male and female subjects, given its association with frequent skipping breakfast. Frequent participation in family dinner by males was desirable, because the more often the males ate dinner with family, the less often they snacked. Frequent maternal criticism of their male offspring's eating habits turned out to be desirable, due to the negative associations between mothers' frequent criticism of their male offspring's eating habits and the frequency with which those males watched TV during dinner. The provision children's/adolescents' favorite foods by their parents was desirable for female subjects because females skipped breakfast less often if their parents provided their favorite foods more often. Perception that dinner was a family ritual had mixed effects on females' eating behaviors, given that the stronger perception of dinner as a family ritual they possessed, the less frequently the females skipped breakfast and watched TV while eating dinner. Again, unlike the negative effects of TV watching during dinner on males' energy and nutrient intake, the unexpected associations between females' TV watching during dinner and energy and nutrient intake suggested that this particular family meal behavior, perception of dinner a family ritual, may be viewed to be both desirable and undesirable.

4.4. Path Models for Parenting Style Dimensions, Family Meal Behaviors, and Physical Activity Behaviors

4.4.1. Adolescents

Beginning with hard exercise, father's nurturing directly predicted adolescents' level of hard exercise. The more nurturing the fathers were toward their adolescents, the more frequently the adolescents participated in hard exercise. Thus, father's nurturing seems to be desirable for adolescents' physical activity. For frequency of sedentary activities, mother's nurturing was the only predictor of adolescents' frequency of sedentary activities, and this association was mediated by a family meal behavior (Figure 7-18). The more nurturing the mothers did for their adolescents, the more likely the parents provided the adolescents' favorite foods, which in turn, predicted increased frequency of sedentary activities by adolescents. Consequently, adolescents appeared not to benefit from the receipt of mothers' nurturing because the path model demonstrated undesirable links among mother's nurturing, parents provision adolescents' favorite foods, and frequency of adolescents' sedentary activities.

Like the findings for the relationships between parenting style dimensions and children's eating behaviors, children's physical activity behaviors had neither direct nor indirect associations with parenting style dimensions.

In summary, maternal nurturing appeared to be undesirable, but paternal nurturing was desirable for adolescents' physical activity behaviors, given that maternal nurturing predicted increased sedentary activities, that is, increased physical inactivity, whereas paternal nurturing predicted increased physical activity. Findings from path analysis supported appreciable differences between children and adolescents in terms of parental effects on child's physical activity behaviors. None of parenting style dimensions was associated with children's physical activity behaviors**,** either directly or indirectly. In the adolescent group, paternal nurturing was a significant predictor for increased physical activity behaviors and maternal nurturing was an indirect predictor for increased sedentary activities. It should be noted that maternal nurturing had a negative effect and paternal nurturing had a positive effect on adolescents' physical activity. Parental control did not affect adolescents' physical activity behaviors either directly or indirectly.

4.4.2. Male Subjects

In terms of the frequency of sedentary activities, mother's nurturing and father's nurturing had a positive direct effect on the frequency with which males' engaged in sedentary activities. Mothers' and fathers' control had no effects on males' physical activity behaviors, and there was no mediation effect by any of the family meal behaviors.

4.4.3. Female Subjects

Among female offspring, mother's nurturing indirectly decreased the frequency of sedentary activities via the increased frequency of parents providing their female offspring with their favorite foods (Figure 7-19). Unlike the causal effects of parenting style dimensions on male and females' eating behaviors and self-concept, relatively few associations were found between parenting style dimensions and physical activity behaviors in male and female subjects. Neither hard exercise nor light exercise was predicted by parenting style dimension for either male or female subjects, and only sedentary activity behaviors were associated with parents' nurturing directly and indirectly. Path analysis revealed a gender difference in terms of parental effects on female offspring's physical activity behaviors. Mothers' nurturing appeared to be undesirable for males, but it turned out to be desirable for females, given that males participated more frequently in sedentary activities and females participated less frequently in these activities in conjunction with greater nurturing by these mothers. In addition, mothers' nurturing had a direct effect on males' sedentary activities, while the association between mothers' nurturing and the frequency of females' sedentary activities was mediated by parental provision of males' favorite foods. Also, father's nurturing provided another direct effect on the frequency with which males engaged in sedentary activities. In summary, males seemed to participate in sedentary activities more often if they perceived more nurturing from parents, regardless of the gender of the parent, whereas only mother's nurturing had an indirect effect on females' sedentary activities. Parental control was not associated with male and female subjects' physical activity behaviors. Overall, the results of path analysis for the two age groups, children and adolescents, are summarized in Tables 7-80 to 7-84. Likewise, Tables 7-85 to 7-89 summarized the path analysis results for male and female subjects (see Appendix F).

CHAPTER VIII

DISCUSSION

1. Overview

The industrialized world has affected every part of our daily lives. With the increasing preference towards convenient life style, decrease in physical movement and consumption of quick-prepared foods such as fast foods and restaurant foods are more likely to substitute for the traditional alternatives. Unfortunately, the price of choosing a convenient lifestyle seems expensive given the increasing rate of obesity and other health problems. Since body weight-related problems are inextricably linked to the surrounding environments including family and society, culture, and human behaviors, these important factors should be taken into account in our investigation of the so-called "obesity epidemic." An emerging message from the literature is the lack of physical activity and positive energy balance, partly, due to the increase in easy-to-prepare foods (e.g., fast foods and less nutritious snacks), which are detrimental to our health because over-consumption of such foods increase the risk of overweight. Existing literature has documented the burdensome result of gaining too much weight, including physical, medical, psychological, economic, and psychosocial problems.

Substantial evidence finds that the prevalence of overweight is increasing in children of all ages. Being overweight during childhood or adolescence is critical because these are the periods in which physical appearance domain of self-concept is becoming more important. According to one study, adolescents who held a thinner body ideal, low self-worth, and low physical self-concept were likely to experience body dissatisfaction and engage in dieting behavior than adolescents who were actually overweight did (193). Consequences of obesity during childhood and adolescence are well documented with emphasis on the undesirable effects of not only of a medical but also of a psychosocial nature (194, 195). Developing weight-related problems during childhood or adolescence may cause both immediate and long-term health effects (196). Researchers from various fields have studied the etiology and risk factors of obesity developed before adulthood. Although there is clear evidence of genetic proneness to becoming overweight, the rapid increase in overweight youth population over past several decades is not fully explained by the genetic connection alone. Environmental factors relevant to becoming overweight that have extensively studied include increased food consumption, decreased physical activity, and increased sedentary activities. Current U.S. children’s and adolescents’ dietary patterns may be characterized as increased consumption of fast foods and non-nutritious beverages and larger portion sizes, frequent snacking using foods high in fat, sugar, and sodium, irregular meal consumption, increased food away from home, and(or) dieting. Certain lifestyle such as eating habits formed in childhood or adolescence may continue into adulthood, therefore, unhealthful dietary or activity patterns of youth may have detrimental impacts on the health and well-being in adulthood.

According to WHO’s definition, health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (5). It may be that examination of psychosocial well-being is as equally important as that of physical health in determining an individual's overall health. A great deal of research done in the areas of nutrition and public health have examined underlying factors that determine an individual's health, such as nutritional, biochemical, and anthropometric status from the perspective of nutritional well-being. Studies of child development have made contributions to our understanding of children's and adolescents' social and psychological development. Parents can influence their children's health behaviors in various ways**,** which include controlling food availability and food intake, sharing parental food knowledge and attitudes, inducting of parental weight concern, and role-modeling of eating habits and activity behaviors. Parenting styles and its correlates with children's various developmental domains have been studied for decades. Evidence is compelling that parenting style and parenting practices are significant predictors of children and adolescents' developmental outcomes. Authoritative parenting style has been found to have significant positive associations with having children/adolescents who are psychosocially well-adjusted, academically more competent, and less inclined to engage in problem behaviors. Unfortunately, few studies have examined the influences that parenting style and its dimensions have on children/adolescents' nutritional health outcomes. Therefore, effects of perceived parenting behaviors on youth' nutritional health have been largely neglected and under-explored. It seems arguable that "If parenting style is an important predictor of children/adolescents' problem behaviors such as substance use and drinking, it should also predict other poor health behaviors." Few studies, in recent years, have reported the associations between adolescents' perceived parenting styles and health behaviors such as dietary and physical activity behaviors (14, 106). Finding from these studies were in agreement with the parenting style theories which claim that authoritative parenting style is considered to be the most balanced, optimal style. Along with the two pioneering studies (14, 106), Golan and Scott paid considerable attention to the importance of parental roles as the key in fostering healthy eating and activity habits and in maintaining children's good health (31). However, investigation on the effects of perceived parenting style on children's multiple aspects of health outcomes including mental well-being as well as nutritional and physical health have been missing from these previous studies. Multidisciplinary studies in which academic insights from various fields, such as nutrition, psychology, and sociology are brought together may be helpful in filling the knowledge gap and to deepen our understanding as to how parenting style and its dimensions influence children/adolescents' health outcomes. The present study, therefore, aimed at scrutinizing parental influence, especially by the inclusion of parenting style and parenting dimensions and their effects on health behaviors, on children and adolescents' health through a wider window. Thus, various health aspects, not only mental well-being (measure of self-concept), but also health-related behaviors (measures of eating and physical activity behaviors) and physical outcomes must be studied.

In addition, foods eaten away from home such as fast foods have been criticized due to their association with detrimental nutritional outcomes such as increased energy and fat intake and body fatness (224, 225). In contrast, family meals may contribute to healthy dietary patterns and weight status in children and adolescents (130, 199), although some study findings are somewhat controversial in terms of the association between family meal and children's health outcomes (16, 34, 197). Therefore, the present study specifically focused on family meal behaviors in order to demonstrate that they are significant predictors of various health outcomes and to show how parenting behaviors are related to family meal behaviors.

For the associations between parental characteristics, such as age, education, income, work stress, and BMI, and parenting style and its relevant dimensions, the study showed that paternal work stress and parental average BMI (especially paternal BMI) were negative predictors, but family income was a positive predictor of authoritative parenting style. Paternal variables such as work stress, BMI, and age were significant predictors of the level of maternal/paternal nurturing and control. Interestingly, parental education was not significantly related to parenting style or parenting dimensions. It might be that parents' recall of their own parents' parenting style and parents' own attitudes toward parenting style play significant role in adopting a certain parenting style and use of parenting skills. Nonetheless, the positive association between parental BMI and non-authoritative style is worthy of notice.

Findings of the present study provided substantial evidence of health beneficial effects of authoritative parenting style for older children and young adolescents. This study generally underscored the crucial roles that gender and age may have in the examination of parenting behaviors. Differential influence between maternal parenting and paternal parenting were detected between older children (9-11 old) and young adolescent (13-15 old) subjects' health outcomes. Also, differential maternal/paternal parenting influences on both male and female subjects' health appeared. In addition, the study discovered the importance of family meals, especially the frequency of family meals and children's perception of parents' family meal-related behaviors in relation to those children's health outcomes. The following paragraphs will be devoted to a brief revisiting of the major findings of the study.

2. Challenges of Examining Multiple Aspects of Health Outcomes

While it is a common belief that individual's health can be determined by multiple factors - not only physical and medical but also mental and psychosocial-, not many studies examine multiple health factors simultaneously. The present study attempted to investigate the effects of parenting style and dimensions on children/adolescents' health through a broad approach by measuring multiple health indicators including self-concept, eating behaviors, physical activity behaviors, energy and nutrient intake, and physical outcomes (body fatness). Findings from this study may contribute to our understanding of how certain parenting style and dimensions affect various aspects of health for children of two different age groups (older children vs. young adolescents) and by gender. The most fruitful outcome of this study is the finding that older children and young adolescents' health outcomes were predicted well by perceived parenting behaviors directly or indirectly via family meal behaviors. Unfortunately but not surprisingly, drawing such straightforward conclusions from the study becomes challenging due to the complex nature of the study results. For example, a certain parenting style dimension turned out to have desirable effects for some aspects of health, but undesirable or no effects for other health outcomes. Also, none of parenting styles or parenting dimensions were significantly associated with all five health outcomes when the statistical significance cutoff, $p<.05$, was adopted. The complex and inconsistent results of certain parenting behavior on overall health outcomes may be, in part, accounted for by several possibilities. First, the complex and inconsistent effects of certain parenting behavior on various health outcomes of subjects of certain age and sex might reveal that in the real world, a certain parenting behavior can be beneficial for some types of health, but the same parenting behavior can be detrimental to some other facets of health. Second, although the study utilized five indicators to examine individuals' overall health, the nature of cross-sectional analysis does not permit proof of causality in testing the relationship between aspects of parenting and health outcomes such as physical outcomes. Third, possible correlations among dependent variables can further complicate the interpretation of associations between parenting behaviors and overall health outcomes. In fact, results from multiple regression analysis found that energy and nutrient intake and physical outcomes were best explained by the subjects' eating behaviors. Correlation and regression analysis showed that subjects' self-esteem was highly associated with the other health outcomes (data are not shown here). Accordingly, a decision was made to examine separately parental influence on subjects' energy and nutrient intake and physical outcomes from the other three health outcomes based on following assumptions that: 1) subjects' self-concept and health behaviors such as eating and physical activities are more likely to be directly influenced by their perceived parenting behaviors; 2) three days of diet record can fail to represent subjects' usual dietary intake, therefore generalization of its associations with parenting behaviors seemed to be problematic; and 3) changes in body measurements can occur over a long period of time as the result of multiple factors.

3. Derivation of Parenting Styles

The parenting style instrument used in this study is a slightly modified version of the instrument developed by Devereux et al. that intended to index nine general parenting behaviors perceived by older children (198). Also, some sources of insight from the work done by Ellis and his colleagues (199) contributed to the development of parenting style construct used for the present study. Factor analysis validated both the empirical independency of each parenting dimension and the interrelatedness of items representing each dimension of parenting behaviors of the Devereux construct. In addition, the parenting style construct developed for the present study was pre-tested for two pilot studies using adolescents from two urban and two rural communities in Texas (156, 157). Both pilot studies supported the appropriateness of studying parenting by measuring children's and adolescents' perceived parenting style. As Devereux et al. pointed out, no direct evidence is available regarding the validity of the use of children's report as accurate accounts of parental behaviors. However, Devereux et al. found that children's and parents' responses with observations of parent behavior were generally converging in their examination of Bronson et al.'s study (200). Also, studies by Paulson and Sputa (92) and Cohen and Rice (89) suggested parenting behavior perceived by children better explained children's behavioral outcomes than parents' own reports.

As was discussed previously, Baunrind's classification of parenting style relies upon the two important dimensions "responsiveness" and "demandingness" and its cross classification creates the four parenting styles. Kim and Rohner (94) addressed a drawback of Baumrind's classification method of parenting styles by pointing out that the method is likely to lose some proportion of study subjects due to subjects' failure to be successfully classified into any of the four parenting style categories. For example, children who perceived parental higher warmth and higher control fell to none of the parenting style categories because neither authoritative or permissive nor authoritarian parenting style is identical to this combination of parenting attributes. Dropping of study subjects is not unique to their studies, but it may be common if a study attempts to group study subjects based on the above mentioned classification method (74, 201). Kim and Rohner's argument sounds intuitive, but it may be overly subjective because they assumed that parental warmth can be divided into two categories (high or low), but parental control into five categories (see Figure 1 of their study). In other words, the researchers assumed that authoritative style explained approximately 12.5% of the conceptual space created by Baumrind's parenting style theory, and authoritarian, permissive, neglecting styles explained approximately 12.5%, 16.7%, and 16.7%, respectively. Consequently, about 41.7% of the conceptual space remained unexplained. This may not be the proper reflection of the original parenting style theories presented by Baumrind and other researchers. It may be that parenting style is one of the most complex concepts to have ever drawn a substantial amount of academic investigation. Although there is considerable amount of accumulated knowledge on the parenting style issue, the classification method of subjects by perceived parenting style seems to need more exploration. For the method chosen to classify study subjects in the present study, some explanation needs to be provided. Because the initial size of study sample was not very large, the loss of study subjects that could result from classification of subjects based on a classification system of only perceived parental nurturing and control could reduce statistical power substantially. Finally, the original 35 parenting style items were merged to 11 parenting style dimensions (see Chapter 6 for details), and then these 11 variables of parenting dimensions were subjected to cluster analysis. The use of cluster analysis relieved the concern regarding potential loss of study subjects resulting from the classification method mentioned above. Also, the two criteria adopted to make decisions on the final number of clusters well supported the two-clustering decision for each group's maternal/paternal parenting styles. However, some limitations of cluster analysis technique needs to be mentioned. In cluster analysis, the decision to select a final number of clusters tends to be subjective because there is no absolutely reliable criterion for selection of final clusters. Given the fact that classification of study subjects based on perceived parenting style would likely have an enormous influence on the whole study, the importance of selecting the most optimal technique to classify subjects must not be overlooked. Finally, because the cluster analysis suggested the two-cluster solution (i.e., authoritative versus non-authoritative) to be the best option, the effects of other parenting styles, such as authoritarian, permissive, and neglectful, and their effects on children/adolescents' health had to remain unstudied. It is likely that non-authoritative style or even the authoritative style derived in this study can be further divided into multiple parenting styles; therefore, future studies on this issue may need to put forth greater efforts in improving the classification of subjects with no substantial loss of subjects due to the classification process. Meaningful approaches can include development of a parenting style questionnaire that is tailored to study subjects' age and gender and finding similar classifications of subjects across multiple classification methods.

4. Continuity and Changes of Parenting Behaviors

Researchers have noted both continuity and changes of parenting behaviors at different phase of child developmental process. Schaeter and Bayley (202) noted maternal love and hostility remained consistently over time compared with maternal control and autonomy expectations. Roberts et al. (203) contended that parents have enduring child-rearing orientation which colors their use of specific discipline techniques in their demonstration that parental control, involvement, and affection levels are all high when children are young, but involvement and affection levels drop off while control remains high as children grow older. Harris et al. stressed that children and adolescents need parental affection, control, and involvement throughout their youth, and parents must adapt the way these important parenting practices are utilized as children grow and develop (204). It was originally hypothesized that parenting style used for older children would differ from that used for young adolescents. Fifty-one percent and 63% of children perceived their mother and father to be authoritative, respectively, compared with 69% and 86% of their adolescent counterparts. In the present study, some evidence of adaptation between maternal and paternal parenting behaviors emerged along with the transition of childhood into adolescence. In the examination of BA (both parents' authoritative style) clusters in children versus adolescents, authoritative mothers appeared to exhibit higher achievement expectations for children, but not for adolescents, while the mothers exerted lower levels of control over both their children and adolescents, compared with the levels of this dimensions used by non-authoritative mothers. By contrast, authoritative fathers used greater control over their adolescents and less control over their children**,** while authoritative fathers maintained high level of achievement expectation for both their children and adolescents, compared with non-authoritative fathers. The slightly different use of parenting practices between mother and father might be an evidence of parental adaptation of their parenting practices to the children's transition from childhood into adolescence. It could be interpreted that mothers tend to lower their expectation for children's behavioral achievement as their children grow older into adolescence, but fathers are more likely to use greater control over and have higher behavioral expectation for their adolescents. It might be that fathers attempt to make up for their spouse's lowered achievement expectations and low level of control over adolescents by adopting higher level of behavioral expectation and control over their adolescents in a home environment with two authoritative parents. It was also hypothesized that parenting style toward boys would differ from that towards girls. In a study of Palestininan-Arab adolescents from Israel, Dwairy found that the effects of parenting style can be differently interpreted, depending on the children's sex and cultural characteristics (205). In the present study, 79% and 70% of females perceived their mother and fathers to be authoritative, respectively, compared with 59% and 60% of their male counterparts. This result is similar to Dwairy's report that parenting style towards girls tends to be more authoritative and less authoritarian than the style of parenting towards boys. The examination of BA clusters for male and female subjects suggested that authoritative mothers and fathers exerted higher control and punishment by withholding privileges for their male children, but not for female children. It appeared that the level of punishment adopted by mothers or fathers over their male children may be affected by their spouses' authoritativeness, given that authoritative mothers punished their sons by withholding privileges more frequently, but authoritative fathers used psychological punishment toward their sons less frequently when the parenting styles adopted by their spouses were also authoritative. This suggests that mothers tend to punish their sons more frequently, but fathers punish their sons less frequently in both-parent authoritative homes. In summary, the study showed mother's and father's parenting behaviors can be adapted for children's gender and differential developmental courses. In general, authoritative mother and fathers tended to use higher level of warmth, praise, help, clear behavioral control, and maturity expectations for both preadolescent and adolescent children as well as for male and female children, whereas a lower degree of parental control was applied to adolescents and females compared with children and males.

5. The Impacts of Parenting Styles and Dimensions

5.1. Children and Adolescents

Generally, authoritative parenting style was characterized by greater degree of care, praise, clear behavioral regulation, helps, maturity expectations, lack of punishment, parent-child shared decision making, and child-alone decision making, but lower degrees of immaturity expectations, parent-alone decision making, and various punishments. Exhibition of high achievement expectations varied by subjects' age and gender.

In children, parental authoritativeness, MA, FA, and BA were all positively associated with children's self-concept and BA turned out to be most beneficial. Maternal/paternal control, however, were negatively associated with children's self-concept. MA and maternal/paternal nurturing were beneficial, but paternal control was detrimental to children's energy and nutrient intake. Paternal nurturing was the only predictor of children's physical activity behavior, tendency of team sport participation. Paternal control was detrimental given its effects on percent calorie intake from saturated fat, and sugar and cholesterol consumption. Children's eating behaviors and physical outcomes were not predicted by perceived parenting behaviors.

Some discussion may be helpful in understanding several study variables that were important in children group. Children's self-esteem can be seen as an indicator of their mental well-being. Given the common belief that children's mental well-being is critical to their overall health, the findings in children group emphasizes the importance of maternal nurturing given its significant effect on children's self-esteem. Perception of parental concern about child overweight may be interpreted as an indirect reflection of body image that children develop about their physical appearance through the eyes of significant others, “parents”. Caution needs to be taken in interpreting percent calories from carbohydrates because 1) it may or may not reflect the amount of added sugars which are generally unhealthful, 2) higher percent calories from carbohydrates may be correlated with lower percentage of calories from fat; therefore, increased calorie consumption from carbohydrates can be considered to be desirable in this regard. According to the Goals for Macronutrients released by U.S. Center for Nutrition Policy and Promotion, individuals should consume no more than 25% of their calories from added sugar regardless of caloric pattern (206). In this study, children’s percent calorie intake from total sugar was about 26%, and a high negative correlation was found between percent calorie from carbohydrate and percent calories from total fat. Therefore, it is reasonable to interpret the increased percent calories from carbohydrates as a reflection of decreased percent calories from fat, and thus it may not be totally undesirable.

Brann and Skinner demonstrated that parenting style reported by parents was not associated with their preadolescent sons’ BMI status (207). Similarly, the present study found no association between parenting style and older children’s physical measurement including BMI. Thus, two studies suggest that parenting style does not affect children’s BMI status, although two studies adopted different methods of parenting style measurement: the present study used children’s perceptions of parenting, and the other study used parents’ perception of parenting.

It is remarkable that neither children's eating behavior nor activity behavior was predicted by their perception of their mothers' parenting style. One possible explanation is that the two-clustering decision made for maternal parenting style seems to be only one of several optimal solutions for selecting the final number of clusters, after a closer examination of the dendrogram and clustering history. Either two clusters or three clusters can be supportive (see Figure 6-1 and Table 6-2); therefore, relationships between level of perceived maternal authoritativeness and children's eating or physical activity behaviors could offset by such possible unclearness in grouping children based on their perception of maternal parenting style.

In the adolescent group, MA was negatively associated with self-perception of overweight, body weight, and subscapular skinfold, but was positively associated with having a normal BMI. Maternal nurturing was also associated with decreased body fatness. Maternal/paternal nurturing was desirable for adolescents' self-concept and energy and nutrient intake. Maternal control turned out to have mixed effects**,** given its negative associations with snacking and calories per body weight unit, but significant positive association with body fatness. In summary, MA and maternal nurturing were negative predictors of, but maternal control was a positive predictor of adolescents' body fatness. Paternal control also had mixed effects based on its desirable effects on self-concept, but undesirable effect on energy and nutrient intake. For calories consumed per kilogram body weight, the results are somewhat more complicated because MA was positively associated, but maternal control was negatively associated with the amount of calories consumed per body weight. Taken together with the findings in children, paternal nurturing was found to be important for its desirable effects on both children's and adolescents' self-concept and physical activity behaviors.

It may worth mentioning that maternal parenting behaviors were significant predictors of older children's self-concept and energy intake and young adolescents' physical outcomes. Maternal non-authoritativeness and greater control over children were positively associated with children's lower self-esteem and increased perception of maternal concern about child's weight. Also, maternal control was a significant predictor of adolescents' body fatness based on its associations with various indicators of body fatness. These findings suggest a hypothetical scenario in which children's lower self-esteem triggered by maternal non-authoritative parenting behaviors and frequent control, including different types of punishments, are adversely linked to children's attitudes toward better health, which may, in turn, foster these children to respond more favorably to the environmental stimuli such as foods high in fat and saturated fat. If the children continue to develop undesirable eating habits such as high-fat foods during older childhood, this can result in increased body fatness in adolescence. The cross-sectional nature of the study does not allow us to examine longitudinal relationships, but this scenario might be a plausible candidate in seeking for explanations for the regression models regarding maternal parenting behaviors and children/adolescents' health outcomes. It is not certain whether a number of other pathways exist in the relationship between maternal control and adolescents' increased body fatness. In the present study, maternal control appeared to be negatively associated with adolescents' caloric intake per body weight and frequency of snacking, but positively associated with body fatness. This result leads to another possible scenario that mothers' intention of keeping their adolescents at a healthy weight status may trigger the mothers to use greater control over their adolescents' caloric intake and food intake such as snacking, but maternal control eventually results in fatter adolescents because maternal control, if it taken to an extreme, might lead to adolescents' rebellion and out of control behavior such as binge eating and weight gain-prone life style, which, in turn, can lead to weight gain and body fatness (147, 148). Or, it is possible that increased maternal control could be seen as simply a reflection of maternal response to perceived inappropriate weight status of their adolescents. In other words, mothers may utilize their parental power to increase control over their adolescents' life in an attempt to reduce their adolescents' body fatness.

Some discussion is warranted regarding the findings that maternal control was negatively associated with calories consumed per kilogram body weight, but positively associated with body weight (kg) in adolescents. This finding implies that adolescents' total caloric intake and body weight are affected differently by maternal control. According to McIntosh et al. (208), this phenomenon is referred to as the "ratio effect" – a variable that is expressed as a ratio (e.g., calories per kilogram body weight) responds to the change of independent variable (e.g., maternal control) will depend on a numerator effect (the effect on calorie intake) and the denominator effect (kilogram body weight). Therefore, inferring certain hypothesis with respect to the association between a ratio variable and a given independent variable is challenging unless the researcher is willing to hypothesize that the effect of independent variable on the numerator is greater than the effect of independent variable on the denominator, or vice versa.

Parental control such as monitoring and discipline is important in the development and outcomes of externalizing disorders during childhood (209) and the literature indicates that children may need less parental control as they grow into adolescence. In contrast, some researchers found parents remain high control as their children develop (203). The present study suggests that parents may need to exert control over their adolescents in certain developmental domains such as eating behaviors and weight status. However, this observation does not mean that paternal control is more desirable than paternal nurturing in adolescents' health. Rather, the importance of paternal nurturing needs to be emphasized**,** given its health beneficial impacts for adolescents including self-esteem, body image, and physical activity behaviors.

With respect to the authoritative style adopted by both parents, BA was desirable for children's self-concept and adolescents' physical outcomes. However, the other health outcomes were not associated with perceiving both parents to be authoritative. It is remarkable that both MA and FA were positively associated with older children's self-esteem and body image, with the beneficial effects of maternal/paternal authoritativeness becoming more conspicuous as children perceived their both parents to be authoritative. That is, the perception of BA explained the most variance of children's self-esteem. In contrast, neither MA/FA nor BA was associated with adolescents' self-esteem. One study partially supports this lack of association between parental authoritativeness and adolescents' self-esteem found in the present study. Fletcher et al. studied adolescents' well-being in relation with perceived inter-parental consistency (201). They noted few meaningful differences between the psychosocial adjustment of adolescents who report having one authoritative parent and the psychosocial adjustment of adolescents who report having two authoritative parents. For example, adolescents' self-esteem was not different between homes in which both parents are authoritative and homes in which there is only one authoritative parent. Moreover no difference in adolescents' self-esteem was found between inconsistent authoritative home and consistent non-authoritative homes in terms of maternal and paternal parenting styles (201). A careful examination of their study revealed an interesting finding: the highest self-esteem score was seen for adolescents from indulgent-indifferent homes and followed by self-esteem scores of adolescents from authoritative-indifferent home, authoritative-indulgent home, authoritarian-indulgent home, authoritarian-indifferent home, and authoritative-authoritarian homes in descending order. Considering the general negative associations between indifferent parenting style and children's developmental outcomes found in the literature, this result is surprising because adolescents whose one parent engaged in indifferent (neglectful) parenting style had generally higher self-esteem. The only exception to this finding is the case of adolescents from authoritarian-indifferent homes. However, results from the Fletcher et al. study and the present study are consistent in that parental authoritativeness was not a significant predictor for adolescents' self-esteem. Due to the two-clustering methods chosen in this study for mothers, fathers, and both parents' parenting styles, it is not clear whether the spouse of authoritative mother is authoritative or non-authoritative. Likewise, the spouse of authoritative father could engage in either an authoritative or non-authoritative style. The non-authoritative parenting style may represent all possible parenting styles including authoritarian, permissive (indulgent), neglectful (indifferent), and any combination of these styles across parents. Therefore, it is not possible within the scope of this study to examine which parenting style among the non-authoritative styles is more strongly associated with adolescents' self-esteem. More research is urged to examine the association between perceived parenting style and young adolescents' self-esteem.

More in-depth discussion may be useful with respect to adolescents' self-esteem. Fletcher et al.'s study showed that adolescents' self-esteem had positive associations with maternal/paternal responsiveness and had negative associations with maternal/paternal demandingness in both cross-sectional and longitudinal analysis (201). The present study detected a positive association between adolescents' self-esteem and paternal nurturing, but maternal nurturing was not significantly associated with self-esteem. This discrepancy in the effects of maternal nurturing on adolescents' self-esteem between studies might be attributable to the fact that items used to create parenting style dimensions were not identical between the two studies. In the Fletcher study, seven items measuring parent's responsiveness and involvement and two items measuring lack of punishment (reverse coded) and strictness were used to develop the two factors "responsiveness" and "demandingness", respectively. In the present study, 12 items measuring parental care, praise, clear behavioral regulation, help, and maturity expectation were included in the dimension "nurturing" and 14 items measuring parental high achievement expectation, control, psychological punishments, harsh punishment, and punishment by withholding privileges were used to create the “control” dimension. Therefore, it may be that responsiveness versus nurturing need to be seen as two different measures, although the two dimensions aimed to measure similar aspects of parenting behavior. Likewise, different components consisting of “demandingness” versus “control” need to be taken into account when one attempts to compare the two studies.

According to Merrel, self-concept can be defined as both an overall view that individuals have about themselves and their view of how well they function in specific roles or under certain constraints (210). Along with the concern about the pandemic of obesity in youth, the literature supported the view that overweight (obesity) during childhood and adolescence may result in detrimental psychological outcomes. Therefore, the present study attempted to develop measures of youths’ self-concept with focuses on both overall view of self and a physical appearance domain of body image. The self-esteem measure by Rosenberg scale was selected due to its high reliability and validity, and many other studies have utilized the scale. Self perception of overweight, activity level, and weight gain were adopted as direct measures of body image developed by children and adolescents, but maternal/paternal concern about child’s overweight was used to represent indirect measure of body image, based on the assumption that parents’ expressed concern about child’s overweight status can increase children/adolescents’ perceived body dissatisfaction, which, in turn, may affect the youth’s body image. Some differences were found between children and adolescents regarding the associations between perceived parenting behaviors and subjects’ body image. Parents appeared to affect children's body image by increasing (or decreasing) children's perception of parental concern about child overweight, whereas parenting behaviors were associated with adolescents' body images by increasing adolescents' own perception of overweight and weight gain. These findings may imply that: 1) self perception of body fatness is more prevalent during early adolescence than older childhood; and 2) children's perception of parental weight concern is more significant**,** compared with their adolescent counterparts, and may reflect relatively intimate relationship between parents and children during childhood compared with that during adolescence.

Overall, the study discovered strong associations between parenting style dimensions and children/adolescents' self-concept including self-esteem and body image. In the adolescent group, paternal nurturing and control appeared to be more influential for adolescents' self-concept than its maternal counterpart. Choo (125) found that maternal warmth, support, and involvement were more significantly associated with psychological outcomes in Asian adolescents compared with the paternal version of these aspects of parenting. Choo also reported that coercive and psychological control by the father was more highly correlated with adolescents' psychological maladjustments than was mother control. By contrast, the present study found one desirable aspect of paternal control, because a negative association was found between paternal control and adolescents' self perception of weight gain. More investigation is needed to better understand how perceived maternal/paternal parenting style and its relevant dimensions are associated with adolescents' psychological well-being and other aspects of health.

It is worth noting that paternal parenting behaviors, especially father's authoritativeness and nurturing, turned out to be important in terms of children and adolescents' physical activity behaviors. Also, paternal nurturing and control were significant predictors of energy and nutrients intake in children and adolescents. Analysis of male and female data further supported the important roles of paternal parenting behaviors for both these groups. All five of the elements of health outcomes in male and female subjects were explained by paternal parenting behaviors, except for females' physical outcomes. Given the public's concern about the lack of physical activities prevalent among children of all ages and the substantial evidence for positive relationships between lack of physical activities and positive energy balance (4), these findings convey an important message that both children and adolescents (male and female) may benefit from perceiving father's authoritativeness and nurturing because paternal authoritativeness and nurturing may have desirable impacts on youths' health outcomes, especially improving the youths' physical activities. It seems that a substantial amount of research on parenting behaviors has focused on maternal parenting or on the average of parental parenting behaviors (211, 212). While there seems to be a growing awareness of the importance of paternal parenting behaviors and its effects (82, 94, 213), most of such studies focused on fathers' impacts on young subjects' social, emotional, and cognitive development, and academic achievement. Also, most of these studies addressed the importance of paternal parenting behaviors using only Asian-American samples. One study done by Paquette et al. reported the importance of father parenting on the issue of child care**,** based on quantitative and qualitative self-report measures of fathering, but the study subjects were 6 years old or younger (214). Unfortunately, no such studies on paternal influences on older children/adolescents' health exist. The findings in the present study may motivate further research in order to increase our understanding of father's roles in various domains of the developmental course of children across various ethnic groups.

Findings from the present study suggest that parenting styles and dimensions were significantly associated with children and adolescents' health-related behaviors and health outcomes, with the exception of children's eating behaviors and body measurements. Generally, maternal parenting behaviors were more likely to be associated with children and adolescents' eating behaviors, whereas paternal parenting behaviors appeared to have strong association with youths' physical activity behaviors. Appreciable associations were found between parenting behaviors and children's self-concept, after controlling for significant confounders. This was anticipated because research over several decades has consistently demonstrated the associations between children's social and psychological well-being and the parenting styles that children experience. The literature support the beneficial effects of parental (maternal and paternal) nurturing and detrimental effect of parental control by examining its direct, moderating, or mediating effects on selected adolescents' outcomes (94). Interestingly, the present study indicated that maternal and paternal control were not exclusively detrimental, but turned out to be desirable for adolescents' eating behavior and adolescents' perception of body weight, respectively, while the effects of parental control appeared to be largely detrimental for subjects' health outcomes. Therefore, further study is advocated in order to better understand as to how maternal/paternal control interacts with adolescents' health by measuring various health related behaviors and correlates.

5.2. Male and Female Subjects

The examination of parental impacts on male and female youths (9-15 year old) revealed some gender-specific characteristics. FA appeared to be the most important predictor for male children's self-esteem, whereas MA was not associated with female children's self-esteem. This might imply the father's authoritativeness matters for their children of the same gender's self-esteem, whereas female children's self-esteem is not significantly associated with the parent's authoritativeness of their same-gender parent. This is similar, in part, to the finding in the American Dietetic Association Foundation's Family Habits and Activities Survey for children ages 9 to 18 that boys were more likely to select their father as a role model (215). FA seemed to be the most desirable parenting style for male subjects' better eating behaviors and self-concept. It is important to recall the characteristics of the authoritative style as perceived by the male children in this study. Unlike the authoritative style perceived by females, males whose parents used the authoritative style perceived higher degree of paternal control dimensions including control, psychological punishment, punishment by withholding privileges, except for harsh punishment. A higher level of control and psychological punishment is often associated with the authoritarian parenting style. Therefore, this finding might imply that fathers' greater use of control**,** including punishments may be beneficial for their male children's self-concept and eating behaviors if the control dimensions are combined with greater amount of positive parenting such as care, praise, help, and maturity expectation. It is also notable that parental authoritativeness was positively associated with male children's sedentary activity behaviors. In females, BA seemed to result in better health outcomes for female subjects, but FA was slightly more important a predictor than MA was.

For relationships between parenting style dimensions and males' health outcomes, paternal nurturing was generally desirable for males' health outcomes including self-esteem, snacking, and percent calories from protein. However, males tended to participate in sedentary activities as they perceived parents' nurturing. Paternal control was not associated with males' self-concept, eating behaviors, and physical activity behaviors, but it was negatively associated with percent DRI for dietary fiber. It may be of interest that none of the parenting styles and parenting style dimensions was a significant predictor of male subjects' body image, whereas females' body image-related variables were well explained by perceived parenting behaviors. This result suggests that perceived parenting behaviors are more likely to affect female children's body image compared with male children. Also, it may be related to the general belief that young females are more likely to develop body dissatisfaction and body-related concerns than males do.

For females' health outcomes in relation to parenting style dimensions, father's control had the most detrimental effect on females' self-esteem, whereas father's nurturing has positive effect on females' self-esteem. Interestingly, neither mother's nurturing nor mother's control had any effect on female subjects' self-esteem. This was anticipated because MA was not a significant predictor of females' self-esteem. Overall, the importance of paternal parenting, especially paternal control dimension, for females' self-concept was highlighted in this study. This result is dissimilar to others' studies. Pychyl et al. found that neither paternal authoritative nor paternal authoritarian parenting affected female adolescents' self-worth (122). Females tended to perceive parental concern about children's overweight more often if they perceived parental control more frequently. This results suggest a possible scenario in which the more control the parents use, the more likely the parents express their concern about child overweight, which may, in turn, indirectly accelerate females' concern about their body weight and shape. Parental nurturing was generally desirable for females' health outcomes, but parental control, especially paternal control led to undesirable impacts on females' self-concept and physical activity behaviors. Weiss and Schwarz (81) reported that parental demandingness was less critical for girls' well-being, compared to boys. By contrast, the present study indicated that paternal control was more significant for girls' self-esteem compared with the effects of paternal nurturing and parental nurturing was more critical to boys' self-esteem over the effects of parental control. One important finding of the present study is that parenting styles and parenting style dimensions have higher associations with males' physical activity behaviors than their female counterparts, but with females' self-concept than with males' self-concept, based on the total amount of associations found between parenting behaviors and health outcomes. This may support the traditional belief that male children and adolescents were more likely to spend a greater amount of time on physical activities such as exercise than their female counterparts, whereas females tended to have greater concern about their body weight and shape, compared with males' concern about such things.

In conclusion, the overall study results shed lights on our investigation regarding the effects of parenting style and dimensions on male versus female youths' health behaviors and outcomes during older childhood and young adolescence. In addition, the study added some evidence to the body of knowledge regarding the associations between authoritative parenting style and children's developmental outcomes. Mothers and fathers may exert significant impacts on their children's and adolescents' health. The most notable findings include 1) desirable effects of authoritative parenting style and parental nurturing and undesirable effects of parental control on children and adolescents' health outcomes with some exceptions in adolescents' health, 2) importance of father parenting style and dimensions as important predictors of children and adolescents' health, and 3) the key role that gender plays in the relationships between parenting behaviors and children/adolescents' health.

6. The Effects of Family Meal Behaviors

With the epidemic of overweight among children and adolescents, factors underlying youth's weight problems have been sought, and weight management-related strategies have been suggested. Providing nutrient-dense foods and healthful beverages, reducing high-calorie, nutrient-poor foods and beverages, encouraging an increase of physical activities, and discouraging sedentary activities are among the generally suggested strategies (4). Researchers also found that parents may play an important role in the pathways to weight problems as well as in the prevention of this problem. Along with the growing awareness of potential parental effects on children's health status, family meals which generally include family members, with parental presence taken into account, have received increased attention by researchers. The present study selected nine family meal-related variables in order to examine relationships among parenting behaviors and children's health outcomes.

Frequency of family breakfast was found to be desirable for both male and female subjects' other health behaviors. Children tended to perceive themselves to be physically more active if they participated in family breakfast more frequently. One study reported factors related to breakfast eating behavior among fifth graders (216). Some of the findings highlighted that children who ate breakfast everyday had a greater appetite for breakfast and went to bed earlier, showed higher scores in family-related self-esteem and pro-social skills, lower scores for aggressive behavior, and perceived eating breakfast everyday as very important, compared with those who skipped breakfast. The present study found no significant association between the frequency of family breakfast and children's self-esteem, but frequent family breakfast seems to be desirable for better eating behaviors and self perception of activity level.

Frequency of family lunch appeared to have mixed effects for children, adolescents, and female subjects' health outcomes. By contrast, frequency of family lunch was desirable predictor of male subjects' eating behaviors, self-concept, and body measurements. It may need to be mentioned that the variable "frequency of family lunch" was not clearly defined if family lunch meal was prepared at home or away from home. This may have something with the mixed health effects appeared in this study. The literature concerning family lunch and adolescents' dietary quality is scarce. More research is advocated in order to better understand the relationship among family lunch occasions and children/adolescents' various health outcomes.

Frequency of family dinner appeared to be desirable because the more frequently with their families, the less frequently adolescents consumed snacks, the higher their self-esteem, and the higher male subjects' self-esteem and the less frequent those males snacked. Females' health outcomes were not associated with frequency of family dinner. According to Rosenberg's study (158), 52% of adolescents' who participated actively in the mealtime conversation had high self-esteem, whereas 52% of adolescents who rarely or never participated in mealtime conversation had low self-esteem. If we assume that the family dinner meal is often chosen for family gathering and interactions among family members, active conversation is likely to occur during the family meal. Results from the present study seem to suggest that male adolescents are more likely to have higher self-esteem as they participated more often in the family dinner meal. The literature supports the hypothesis that children and adolescents benefit from participating family dinner meal by improving their essential nutrient intake profile and, furthermore, maintaining healthful body weight. One study showed that adolescents who participated in the family dinner more frequently consumed higher amounts of calcium, iron, fiber, folate, vitamins B_6, B_{12}, C, and E, but the adolescents had a lower glycemic load and lower intake of saturated and trans fat as a percentage of energy intake (16). Another study showed that parental presence during the evening meal was positively associated with adolescents’ higher consumption of fruits, vegetables, and dairy foods (130). In a recent study, adolescents who ate dinner with family on “most days” or “every days” showed a significantly lower tendency of being overweight compared with adolescents who ate family dinner “never” or “some days”; however, the study showed no beneficial effect of family dinner on adolescents’ weight in the longitudinal analysis (195). By contrast, the present study showed that neither the subjects’ energy and nutrient intake nor their physical outcomes was associated with frequency of family dinner. One possible explanation for the lack of association is a multicollinearity problem among variables. A total of nine family meal-related variables were incorporated into the present study, and there were appreciable correlations among these variables. For instance, adolescents’ frequency of family breakfast, family lunch, family dinner, and perception of family dinner ritual were significantly inter-correlated. Therefore, some independent variables that were highly correlated with others had to be dropped from regression models in order to meet regression assumptions. For example, variable “frequency of family dinner” had to be dropped due to multicollinearity problem with the variable “perception of family dinner ritual” in some models.

Turning to the effect of the family meal consumed away from home, numerous studies suggest the increasing trend in consumption of food away from home. This trend has been increasing (217) and food expenditure on food away from home is anticipated to increase by 28% by 2020 (218). Statistics from the 1994-1996 Continuing Survey of Food Intakes of Individuals data showed about 40% of males (age 12-59) ate at fast food restaurants on any given day, compared to only 18% of females (age >60 years old) and high income, teenage males, women, and young children are among the significant correlates of food away from home (219). It was reported that children's (2-19 years old) consumption of fast food and other modern food sectors was more prevalent in certain countries including the U.S. Children in the U.S. consumed more than one-third of their daily calories and a higher proportion of snack calories from foods prepared away from home and fast food alone provided approximately 20% of energy compared with children from other countries (220). The increasing trend of food consumption away from home may be a multidimensional social issue that needs to consider many factors (both causes and health effects) together. One study stressed that one of the underlying factors for the obesity epidemic is the changes occurred to children's lifestyle that eating as a primary activity has declined and a shift has occurred toward snacking or eating as a secondary activity at the same time that consumption of certain types of carbohydrates (e.g., chips, crackers, popcorn, pretzels, and soft drinks) has doubled or tripled during the past two decades (221). The same study found a link between these changes and use patterns of household income and contended that the percentage of disposable income spent on food has declined and almost all of that decline involves food consumed at home**.** Yet today's disposable income buys more calories than it has in the past because the increase in relative price for fresh fruit and vegetables was greater than that for soft drinks during 1982-2002 (221). A major concern regarding food away from home has to do with the nutritional impacts of foods eaten away from home, in that such meals were associated with significantly higher amounts of energy, fat, saturated fat, sodium, and carbonated soft drinks, and considerably lower intakes of fruits, vegetables, and milk and vitamins A and C. Moreover, a higher percentage of children (42%) consumed fast-food compared with adults (40%) (222, 223). Of greater concern, food away from home was positively associated with body fatness among children and adolescents (224, 225). A longitudinal study of females aged 8 to 12 at baseline and follow-up study three years after tracked the changes in BMI-z score to examine possible associations between BMI-z score and frequency of eating food away home and energy derived from food away home. The results suggested that adolescent girls' quick-service food consumption increased from childhood through adolescence and a significant positive association was found between the frequency of eating quick-service food and BMI –z score change in both the cross-sectional and longitudinal analyses (225). The present study found evidence for the positive association between food away from home and body weight in children. Children were more likely to perceive themselves to be gaining weight as they consumed family dinner meals away from home more frequently, while a direct association between the frequency of family dinner away from home and BMI (or BMI z-score) was not detected. In addition, males' percent DRI for calcium and iron and females' percent DRI for dietary fiber were negatively associated with frequency of family dinner away from home. Calcium and iron are nutrients which nutrition experts have continued to emphasize the adequate intake of in order to promote optimal growth during childhood and adolescence. Also, dietary fiber has been received a great deal of attention due to its health benefits. Therefore, the findings suggest that food away from home may have detrimental effects on children and adolescents' nutritional outcomes. It seems that presence of a family member during dinner meal did not offset the negative effects of food away from home on the study subjects' nutritional outcomes. It needs to be mentioned here that only dinner meals, not other meals, were taken into account by the variable, "food away from home", in this study. If we recall the discussion on the negative effects of frequency of family lunch, it might be that family lunch as well as dinner meals consumed away from home may result in additional undesirable outcomes.

Perception of family dinner ritual appeared to have a number of desirable health effects including physical activity behavior, self-esteem, body image, and energy intake in males and eating behaviors and self-concept in females, self-concept and physical activity behavior in children, and self-concept and eating behaviors in adolescents. Nonetheless, males tended to have greater triceps and subscapular skinfolds and children tended to be at risk for overweight in relation to perception of the family dinner ritual. Today, children eating alone have become more common than in the past, partly due to the changes in children's own lifestyles as well as parental work-related factors. Adolescents tend to gain more freedom in their food selection and food consumption compared with children, but the resulting consequences are often unfavorable in terms of skipping meals, binge eating, dieting, and unhealthful snacking. It was anticipated that the more children/adolescents perceived family dinner meal as a ritual, the more likely they would participate in the family dinner. Unsurprisingly, a high correlation was detected between frequency of family dinner and perception of family dinner ritual for all analysis groups in the study. Previously, the multicollinearity problem was mentioned in the discussion of frequency of family dinner. Multiple regression analysis confirmed that the five dimensions of health outcomes incorporated in this study were better explained by the variable "perception of family dinner ritual" compared with the variable "frequency of family dinner". This conveys an important message that children/adolescents' perception of family dinner meal may be positively associated with their participation in family dinner meal and the positive health effects of family dinner meal are more prominent when the youth perceive the family dinner as an important family ritual.

Next, one of the most interesting findings in the present study is the effects of "lack of food pressure from parents" have on children's/adolescents' eating behaviors and nutritional outcomes. This variable is one of the factors created in this study and it consists of three items measuring the degree of child's perception of parental lack of pressure on the child's food consumption. The higher the factor score, the more likely the child is endowed with the freedom of choice regarding "what to eat" and "how much to eat". Researchers studied the effects of parental controlling feeding strategies such as restriction of foods, pressuring to eat more, and monitoring child's eating behaviors. Restriction of access to food has been associated with negative self-evaluation in girls and may actually promote intake of these foods as well as eating in the absence of hunger. Pressuring children to eat healthy foods increased intake but decreased preference for those foods (146, 226, 227). Their findings seemed to converge into one take-home message that parental-controlling feeding strategies may result in children's poor nutritional outcomes such as unhealthful eating habits or undesirable weight status through a possible mechanism of children's lowered self-regulation ability. However, there seems to be an inconsistency in the relationship between parental controlling feeding strategy and children's body fatness. One study done by Robinson et al's study found an inverse association between parental control over child's eating and female third graders' BMI, but there was no association with third-grade boys' BMI (149). Another study**,** using only boys aged 8 to 10 years old**,** indicated parental-controlling child-feeding practices were more likely to be associated with boys having an average BMI (207). It needs to be mentioned that substantial evidence of negative consequences of parental controlling feeding strategies has appeared in the literature, but most of these conclusions were drawn from studies of grade-school children or even younger subjects. Therefore, the question "Is parental food control over their older children and adolescents' eating as detrimental as it was shown to be for young children?" has remained unanswered. Of interest, parental lack of food pressure examined in the present study was associated with undesirable eating behaviors and (or) unhealthful nutritional profiles in all four groups. In other words, parental food pressure can be interpreted to be desirable. The negative effects were more remarkable in adolescent group based on outcomes including skipping breakfast, TV watching while eating dinner, and decreased consumption of essential nutrients such as calcium, iron, folate, and vitamin A. However, other findings appeared to contradict this, because parental lack of food pressure was negatively associated with consumption of total calories, calories per kg body weight, and sodium and cholesterol intake in adolescents, all of which can be considered to be desirable nutritional outcomes. A closer examination of correlation and multiple regression results revealed the following findings that 1) lack of parental food pressure and adolescents' breakfast skipping behavior were highly correlated and multiple regression analysis confirmed that parental lack of food pressure is the most significant predictor of adolescents' breakfast skipping behavior, 2) correlation between breakfast skipping behavior and total calorie intake was greater than that between lack food pressure from parents and total calorie intake, 3) variances of total calorie, calories per kilogram body weight, sodium, and cholesterol were better explained by adolescents' skipping breakfast behavior compared with the amount of variance explained by lack of parental food pressure. These findings suggest a possible causal pathway from lack of parental food pressure to adolescents skipping breakfast, which, in turn, results in decreased daily food intake and corresponding reduction in absolute daily intake of energy and nutrients. Path analysis confirmed the indirect effect of lack of parental food pressure on adolescents' total caloric intake that was mediated by the frequency of skipping breakfast; this was statistically significant ($p<.001$, path analysis result is not shown here). Accordingly, it may be less useful to emphasize the negative associations between parental lack of food pressure and adolescents' consumption of total calories, calories per body kg weight, sodium, and cholesterol because the lower consumption of energy and of the two nutrients may be more attributable to the decreased food intake due to skipped breakfast. In summary, findings with respect to parental lack of food pressure delivers an important message that children and adolescents, both male and female, may benefit from having parents who use parental authority to encourage their children to finish eating their food even if served foods are not the children's favorite choices because children/adolescent may skip their breakfast less frequently, which, in turn, result in improved consumption of essential nutrients. This conclusion may gain additional support from the general agreement in the literature that parents attempts to increase the child's intake of "healthy" foods by pressuring the child to eat more of a particular food. Although the findings of this study regarding parental lack of food pressure suggests a somewhat opposite message of previous studies, several things need to be considered to prevent overgeneralization of the study findings: first, the factor variable "lack of food pressure from parents" was measured by the food pressure of parental encouragement of their children to finish foods, rather than by a broad measure of parental controlling feeding strategies; thus the study results should not be generalized as effects of all types of parental food control. More studies deemed necessary in order to examine the effects of different types of parental food-controlling practices over older children and adolescents. Second, unlike other studies that utilized parents' own perception of their feeding style and child's health status, the present study used children/adolescents' perception of parental behaviors such as parenting behaviors and food-related behaviors. Different sources of study data may explain the inconsistent results across studies. Paulson and Sputa (92) and Cohen and Rice (89) reported that adolescents' perceptions better explained their developmental outcomes compared the effects of parents' perceptions. It could be that how older children/adolescent perceived certain parental behavior is more directly associated with how they respond or interact with the inputs from their parents.

Some might claim that adolescents' breakfast skipping might actually be desirable for the purpose of reducing total energy consumption, caloric intake per kilogram body weight, sodium and cholesterol**.** Examination of multiple regression results provided some insights into this question. For cholesterol, gender (being male) was the strongest predictor and followed by TV watching while eating dinner**,** and skipping breakfast in descending order in terms of the size of their standardized regression coefficients. Adolescents' sodium intake was positively associated with being male and increased frequency of snacking, but not associated with the frequency of skipping breakfast. This suggests that skipping breakfast may not be the most important determinant of lower consumption of cholesterol or sodium. More importantly, the effects of skipping breakfast on adolescents' nutritional profile and body measurements turned out to be considerably undesirable given its detrimental outcomes, including increased percent calories from total fat, lower percent DRI for essential nutrients such as calcium, iron, folate, vitamin A, vitamin C, and dietary fiber as well as heavier body weight, higher BMI and BMI z-score. Studies showed positive effects of breakfast eating on adolescents' nutritional consumption and BMI. One study suggested positive association between skipping breakfast and BMI in adolescent females. Affenito et al. tracked females of ages between 9 and 19 to examine associations between breakfast eating and body fatness. Breakfast consumption dropped as the females aged. Girls who reported eating breakfast during all three previous days had a BMI 0.7 units lower than girls who did not eat breakfast at all. The difference in BMI units increased to 1.65 units if the breakfast included cereal. The researchers contended that the positive association between breakfast skipping and greater BMI may be more reflective of overall eating habits and quality of food consumed (228). Another report using the same study data discovered that the number of days of eating breakfast was associated with higher calcium, fiber, iron, folic acid, vitamin C, and zinc intakes and decreased intake of fat and cholesterol**,** after adjusting for energy intake (229). Therefore, it may be more useful to emphasize the undesirable effects that skipping breakfast have on adolescents' essential nutrients intake and body weight, while noting that skipping breakfast was also associated with decreased consumption of total calorie and calorie per unit body weight.

The study, however, raised a question about the relationship between calories consumed and body fatness, because the results seemed to imply that skipping breakfast was positively associated with body fatness, but negatively associated with energy intake. Most studies that report a relationship between energy consumed and body fatness such as body weight, BMI, skinfold thickness were conducted longitudinally, and do not report on the cross-sectional relationships between caloric intake and measures of body. More importantly, the literature shows a great inconsistency in the relationship between overeating and overweight: some report a positive relationship (230), others an inverse relationship (231), still others a mixed relationship (232, 233), and some no association (234-237). Several known factors such as underreporting, activity level, and age may make the interpretation of such findings difficult. Untangling the interrelationships between energy intake will be challenging due to their complex nature, but it is crucial to clearly understand the relationships between diet, activity, inactivity, and weight in order to better advise the public.

Next, the present study utilized another parental food-specific behavior, “parents provide child’s favorite food,” in an attempt to compare two different parental food-related behaviors. While “parental lack of food pressure” emphasizes parental passive involvement in children’s eating, parents’ provision of the child’s favorite food highlights a parental efforts to respond positively to children’s food preferences. It was anticipated that this particular parental food behavior may result in mixed effects on the health of youth**,** because a positive response to children’s requests for their favorite might be desirable for children’s self-concept, but the same behavior might have undesirable impacts on children’s eating, activity behavior, or nutritional outcomes, because children’s favorite food choices may not always be healthful. As was anticipated, adolescents had higher self-esteem, but they engaged in sedentary activities more frequently in conjunction with parents’ frequent provision of their children’s food preferences. The effects of parental provision of children’s favorite foods turned out to be desirable for children, male and female subjects, and the positive effects were most conspicuous in female subjects in terms of less frequent skipping breakfast, less frequent sedentary activities, perception of lesser maternal/paternal concerns about their weight, and smaller triceps skinfolds.

Next, two additional family meal-related variables examined in this study are maternal/paternal criticism of their child’s eating. According to one study, parents who were highly critical showed more antagonism, negativity, disgust, harshness, and less responsiveness toward their children compared to parents who were less critical (238). Unlike other family meal-related variables, parental criticism of children’s/adolescents’ eating was measured separately for mother and father, based on the assumption that maternal criticism perceived by children and adolescents (as well as male and female) may differ from perceived paternal criticism in terms of the degree of this criticism and its' effects on children's/adolescents' health. In fact, the literature supports the idea that gender is a significant factor when children's health is the focus. Some studies have highlighted the important role parents play in children and adolescents' health behavior, especially positive role fathers play in their sons' health (207, 215, 239). In a study about the impact that parental expression of emotion has on children's (6-11 years) behaviors, maternal criticism was strongly correlated with children's behaviors and fathers expressed more warmth towards boys than did mothers (239). The present study found a high association between maternal criticism and negative health outcomes in females such as more frequent snacking and sedentary activities. In the age group analysis, maternal criticism was detrimental for both children and adolescents**,** given that maternal criticism was associated with increased perception of maternal weight concern in both children and adolescents and with higher levels of snacking in adolescents. By contrast, maternal criticism of male subjects' eating appeared to be desirable**,** because males ate dinner while watching TV less frequently. Paternal criticism of children's eating turned out to be detrimental for both male and female subjects' eating behaviors, reflected in the decreased consumption of vitamin-mineral supplements, increased tendency of current dieting in males, and increased snacking and eating dinner while TV watching in females. In addition, paternal criticism of children's/adolescents' eating was linearly associated with children's/adolescents' perception that their fathers were concerned about those children's weight and with children's lower self-esteem. The negative impacts of parental criticism found in this study are in agreement with reports in the literature. One study of high school students found positive associations between the measures of parental criticism, low self-esteem, and worry and the measures of eating disorders, especially during stressful situations such as test-taking (240). Another study showed that paternal hostility, but not parental criticism, exerted a negative effect on diabetic children's glycemic control (241). Wamboldt and Wamboldt found an association between level of family criticism and children's less adherence with treatment of diabetes (209). Substantial evidence from the literature seems to deliver one common message: parental criticism is not beneficial for their children; in fact, the resulting outcomes appeared to be in the direction opposite that of the parental intentions. The present study also confirmed the negative impacts of parental criticism of children's eating, because the more frequently parents criticize children's eating habits (parents may criticize children's unhealthy eating habits), the more likely children/adolescents behave in the opposition to parental intentions (e.g., increased tendency to snack, eat dinner while watching TV, and weight-loss dieting). One exceptional finding from this study was the desirable impact of maternal criticism on males' eating behavior, given the association between maternal criticism and males' TV watching while eating dinner. This suggests that maternal criticism of male's eating was not as detrimental as such criticism's effects on females, suggesting maternal criticism of males' eating can help prevent undesirable eating behaviors in males. This was more the case for male children than for male adolescents (recall the negative effect of maternal criticism on adolescents' eating).

Another important finding regarding parental criticism about children's eating is its strong association with study subjects' perception of maternal/paternal concern about children's weight in male subjects. As was indicated in previous chapters, the present study utilized three body-image-related variables: 1) child's own perceived overweight status, and 2-3) child's "perceived maternal/paternal concern about child's overweight," which may indirectly exert a negative impact on children's body image. Therefore, this can be interpreted the study detected the possibility that parental criticism of children's eating have an indirect, negative impact on the body image held by youth acting through an increased perception of parental weight concern. Unfortunately, this study did not measure subjects' body dissatisfaction or weight concern. The Thomson and Sargent (242) study provides some insights into our interpretation of parental weight concern**,** because they found that women with greater weight concern were more likely to report parental criticism during childhood. It is reasonable to consider that relationship between criticism (child's perception of parental criticism about eating) and concern (child's perception of parental concern about child's weight) may be inter-related rather than rigid and unidirectional. Further examination in a longitudinal setting may help elucidate associations among parental criticism of child's eating, parental weight concern, and child's body image and eating habits. Finally, Brewin et al.'s study supports the usefulness of measuring parental criticism by means of children's/adolescents' perceptions of criticism, rather than from parental reports, based on their finding that females' self-criticism of their appearance was related to those females' perceived parental criticism, but not to parents' reports of criticism of their daughters (243).

In conclusion, the present study confirmed the view that older children and young adolescents' eating behaviors, self-concept, and energy and nutrient intake were well explained by family meal behaviors. When all five health outcomes examined in this study were considered, somewhat conflicting results rendered generalization regarding associations between certain family meal behaviors and a targeting group's (e.g., children) health outcomes impossible. In general, the frequency of family breakfast, frequency of family dinner, and perception of family dinner as ritual were desirable from a health standpoint, but lack of food pressure and paternal criticism of children's eating were undesirable outcomes, whereas frequency of family lunch, frequency of family dinner away from home, parents provision of their child's favorite foods, and maternal criticism of child's eating has mixed effects.

7. Is Parenting Behavior Mediated by Family Meal?

As I previously indicated, results from the multiple regression analysis suggested the possibility that family meal behaviors may mediate the association between parenting behaviors and children's/adolescents' health outcomes. The path analysis confirmed some causal relationships in which maternal/paternal nurturing or control can affect study subjects' health outcomes directly or indirectly, via the mediation of family meal behaviors. In addition, the examination of statistical significance of indirect effects in the path analysis revealed that not all of family meal behaviors can mediate the effects of parenting style dimensions and that some family meal behaviors appeared to be more important mediators compared with other family meal behaviors. For example, the frequency of family breakfast and frequency of family dinner away from home did not play a role as a mediator, whereas perception of the family dinner as a ritual mediated the most associations. Given the somewhat unclear causal relationship between maternal/paternal criticism of children's/adolescents' eating and maternal/paternal concern for their children's/adolescents' weight, a decision was made to ignore in the discussion of the path analysis a significant relationship found between these two variables.

In the children and adolescent groups, children's self-concept including self-esteem and perception of parental weight concern was explained by parental nurturing and control and children's perception of family dinner as a ritual turned out to be the most important mediator of parental nurturing. In addition, paternal criticism about child's eating was a significant mediator of parental control. In summary, parental nurturing had both direct and indirect positive effects on children's self-concept. Children's perception that the family diner was a ritual turned out to be the most significant mediator in the models; one that intensified the effect of parental nurturing, which was considered a desirable outcome. Paternal criticism of children's eating amplified the negative association between parental control and children's self-esteem. In contrast, adolescents' self-concept was predicted only by paternal nurturing and this association was not mediated by family meal behavior. For eating or physical activity behaviors, none of the indirect associations were statistically significant in the children's group. By contrast, parental nurturing and control had both direct and indirect effects on adolescents' eating and physical activity behaviors. Interestingly, maternal nurturing turned out to be undesirable for adolescents' physical activity behavior**,** given its positive association with frequency of sedentary activities, but maternal control turned out to be beneficial for adolescents' eating behaviors**,** given its negative effects on frequency of snacking and frequency of eating dinner while watching TV.

Path analysis revealed several important findings that suggest the ultimate effects of parental nurturing appeared to be desirable when parental nurturing was mediated by adolescents' perception of family dinner as a ritual. By contrast, the variables "parents provide the child's favorite foods" and "lack of food pressure from parents" turned out to be the mediators that led to negative health outcomes in adolescents (i.e., maternal nurturing was associated with an increased degree of parents provision of their child's favorite foods, which, in turn, was associated with increased frequency of sedentary activities. That is, this led ultimately to detrimental heath behavior. Maternal control was negatively associated with lack of food pressure from parents, which, in turn, was associated with decreased frequency of TV watching while eating dinner. Overall, paternal nurturing seemed to be the most desirable parenting style dimension for adolescents' health, based on its positive effects on self-concept and eating and physical activity behaviors. Maternal control seemed to be the second most desirable dimension**,** given its positive effects on the eating behaviors of adolescents. Taking the findings of the path analysis for the children and adolescent groups together, the study seems to deliver several important take-home messages regarding parents' parenting strategies: 1) father's greater nurturing may assist children and adolescents in developing better self-concepts, 2) father's greater nurturing may support their adolescents to adopt better eating and activity behaviors, 3) mothers may need to use greater nurturing and less control in order to help their children develop better self-concepts as their children approach early adolescence. However, it appears that mothers need to be able to change their parenting strategies from greater nurturing and less control to less nurturing and greater control during the adolescent period of childhood, ages 13 to 15, based on the relationships found between maternal nurturing/control and adolescents' health outcomes, and 4) children may benefit from the perception that parental control is low, whereas adolescents' health outcomes may not be significantly affected by the level of paternal control either directly or indirectly.

Turning to the male and female group analysis, path analysis revealed a number of indirect effects that parental nurturing and control have on male and female subjects' health outcomes. This may be, in part, attributable to the fact that the effects of family meal behaviors are more distinguishable in the gender analysis than the age-group analysis. For example, as many as six family meal behaviors played roles as significant mediators of parental nurturing/control in male and female subjects, compared with four instances in which family behaviors mediated the effects of parenting style dimensions in children/adolescents models. However, interpretation of the path analysis results for male and female subjects became more complicated because some parenting style dimensions turned out to be both desirable and undesirable.

Parental nurturing had a positive impact on males' self-esteem either directly or indirectly via males' perception of family dinner as a ritual. By contrast, females' self-esteem was only directly predicted by paternal nurturing and control. This result is remarkable because females' self-esteem was not affected by their mothers' nurturing or control. Maternal/paternal nurturing indirectly predicted males' perceived maternal/paternal weight concern via the mediation of frequency of family lunches. By contrast, parental nurturing and control was strongly associated with females' perception of parental weight concern both directly and indirectly via the perception that the family dinner was a ritual.

Examination of path models for male/female subjects' eating behaviors highlighted the significant mediating effects of certain mediators. Indirect effects of maternal control appeared to be desirable for males' eating behaviors via two pathways: 1) via a negative association with lack of food pressure from parents, and 2) via a positive association with maternal criticism of children's eating. These mean that the effect of parental lack of food pressure was detrimental, but the effect of maternal criticism of males' eating was desirable. Examination of the effects of parenting style dimensions on females' eating behaviors revealed three important findings: 1) females' eating behaviors were not predicted by parental control but instead were predicted by parental nurturing, 2) parental nurturing did not directly predict, but only indirectly predicted females' eating behaviors via family meal behaviors, and 3) the effect of mediators on females' eating behaviors determined the overall indirect effect of maternal nurturing. For example, maternal nurturing appeared to be mediated by three different family meal behaviors: females' perception of family dinner as a ritual, parents' provision of their child's favorite foods, and lack of food pressure from parents. When maternal nurturing was positively associated with the first two mediators, the effect of maternal nurturing on females' eating turned out to be desirable in terms of decreased frequencies of skipping breakfast and eating dinner while TV watching. However, as maternal nurturing was positively associated with the mediator lack of food pressure from parents, the positive association led to a detrimental effect of maternal nurturing, given the increased frequency of snacking that resulted from the lack of food pressure from parents. Paternal nurturing was mediated only through females' perception of family dinner as a ritual, which, in turn, resulted in positive outcomes such as decreased frequency of skipping breakfast and eating dinner while watching TV. In summary, the frequency of family dinners and maternal criticism about males' eating turned out to be desirable mediators for male subjects' eating, whereas perception of family dinner as a ritual and parents provision of their child's favorite foods appeared to be beneficial mediators for females' eating behaviors. Lack of food pressure from parents was common mediator for both male and female subjects' eating and it had undesirable effects on the subjects' eating behaviors. Consequently, maternal control turned out to be desirable for males' eating via decreased lack of food pressure from parents, but maternal nurturing turned out to be detrimental for females' eating via increased lack of food pressure from parents. Overall, the path analysis underscored significant causal relationships in which parental parenting style dimensions exert some impacts on male/female subjects' eating behaviors either directly or via family meal behaviors.

Unlike the effects of parenting style dimensions on male/female subjects' eating behaviors, relatively few associations were found for the subjects' physical activity behaviors. Interestingly, physical inactivity, not physical activity, was predicted by parental nurturing. Both maternal and paternal nurturing turned out to be undesirable for males' physical activity behaviors given their direct, positive effects on sedentary activities, whereas maternal nurturing turned out to be desirable for females' physical activity given its positive effect on parental provision of their child's favorite foods, which in turn affects decreased sedentary activities in females. Again, these findings support the important roles that mediators play in that this mediator (parents provide child's favorite foods) determined the ultimate effect of maternal nurturing.

When the effects of parenting style dimensions on self-concept, eating and activity behaviors were taken into consideration altogether, interpretation of overall effects became complicated. Parental nurturing, maternal control, and paternal control turned out to have mixed, desirable, and no effects on males' health outcomes, respectively. Interestingly, maternal control had stronger, more desirable effects than parental nurturing did on males' health outcomes. In females, maternal nurturing turned out to be largely desirable (i.e., the negative effects on perception of maternal/paternal weight concern, frequency of breakfast skipping, and frequency of sedentary activities) except its undesirable effect on frequency of snacking. Paternal nurturing appeared to be desirable in that paternal nurturing was positively associated with self-concept and eating behaviors in females. This result is also somewhat surprising, because paternal nurturing appeared to have more positive effects on females' health than did maternal nurturing. By contrast, parental control turned out to be detrimental to females' health given its strong impacts on females' self-concept. Overall, these complicated results may be partly attributable to the fact that family meal behaviors played significant mediating roles in the relationships between parenting style dimensions and male/female subjects' health outcomes.

Inclusion of family meal behaviors as mediators for the association between parenting style dimensions and health outcomes of children's/adolescents' as well as male/female subjects' strengthened the overall research frame. Parenting style dimensions affected the health of the youth in the study directly as well as indirectly via the mediation of family meal behaviors. In conclusion, investigation of roles of family meal behaviors increased our understanding of how parenting style dimensions perceived by children/adolescents (males/females) can be associated with health outcomes in youth.

8. Limitations of the Present Study and Suggestions for Future Studies

The limitations of the present study need some discussion. First, the present study could not divide the sample into four subgroups by cross classification of the two age groups and gender due to the resulting small sample sizes. Consequently, comparing maternal/paternal impacts for four groups of children was virtually impossible. Future studies stratifying on age group and gender may permit exploration of the differences in parenting style and its effects across these groups. Second, the present study was unable to extend its investigation into various parenting styles such as permissive, authoritarian, and neglectful parenting, partly, due to the grouping method adopted in the study. The findings regarding lack of food pressure from parents suggests that permissive parenting style may be detrimental to children's and adolescents' health outcomes based on the assumption that lack of food pressure from parents reflects parents' permissiveness. Methods that result in a classification of study subjects into various groups in terms of perceived parenting style would improve our understanding of how differences in parenting style is associated with children/adolescents' health outcomes. Third, enactment of the sampling plan adopted by this study failed to incorporate data from low income families. Thus, it was not possible to thoroughly examine the effects of low family income on parenting styles and child's health outcomes. Fourth, while multiple regression analysis and path analysis provided some insight into our understanding on possible causal relationships between parenting behaviors and child's health outcomes, the cross-sectional nature of the present study interfered with the examination of possible changes in parenting behaviors as children mature from older childhood into early adolescence. Likewise, long-term health consequences of parenting behaviors were not fully investigated due to the cross-sectional design of the study. Fifth, peer influence, particularly in the areas of deviance in adolescence, is well documented in the literature (244, 245). Given the increasing opportunities of food consumption or physical activities in the presence of friends during older childhood and adolescence, peers may play important roles on the development of certain eating behaviors or activity habits. Tramm found that parenting styles had greater impact on adolescents' cardiovascular health risks than peer influences did (157). However, the present study did not measure peer influence in relation to children/adolescents' health outcomes. Consequently, comparison between parental influence and peer influence in terms of children/adolescents' health outcomes was not possible. Sixth, findings from the present study indicated that parental work-related stresses and BMI were significant predictors of parenting style and relevant dimensions. However, the survey instruments used in this study did not allow for the examination of the relationship between parent's inclination toward child-rearing practices and the child's perception of parenting style. Therefore, future studies that include parents' perception of their own parents' parenting style and parental attitudes toward parenting styles, along with other correlates may improve the investigation in determining important factors of parenting style parents adopt. Finally, a relatively small sample size and lack of ethnic diversity of study sample are also among the limitations of the present study.

Some suggestions for future studies can be made based on the finding of the present study. First, several things regarding the methods of collecting dietary data need to be mentioned. Researchers from different fields have shown that children and adolescents behave differently in many developmental domains. The assumptions of the difference between these two young populations should be taken into consideration for each step of survey process. For example, attitudes, abilities, and performances may be different between children and adolescents when they conduct their 24-hour diet recall and diet records. It is possible that a 9-year-old boy and a 15-year-old girl may perform differently in terms of data accuracy. Future studies need to put some efforts in developing interviewing methodologies that are tailored for subjects of certain age and gender to increase the accuracy of data. A well-planned pretest, feedback from pretest participants, and analysis of the performance for both survey instrument and study sample would provide more insights into the understanding of a particular sample, especially if the researchers concern about potential error sources for conducting the 24 hour diet recall and diet record. Second, the study showed significant relationships between paternal parenting behaviors and adolescents'/male subjects' physical activity behaviors. The physical activity-related data was obtained from subjects' self reports regarding their usual frequency of certain types of physical activity. Future studies may benefit from incorporating physical activity data obtained by the use of activity diaries, because activity diaries can provide additional information about exact hours individuals spent for certain activities, simultaneous activities such as sedentary activities and snacking, and inter- and intra- person relationships between physical activity and physical inactivity (e.g., sedentary activities). Finally, overall findings of the study indicated that parenting style and its dimensions had the most impacts on components of children's/adolescents self-concept such as self-esteem and body image. Because the study concerned five aspects of health outcomes as dependent variables, inter-relationships among these dependent variables were not examined within the frame of the research. Consequently, the relationship between subjects' mental health such as self-esteem and physical health such as body measurements remained in question. According to the social-cognitive views of social support theory, perceived support promotes self-esteem, which leads to health outcomes. Also, this theory proposed that perceived support leads directly to health outcomes (246). Parents generally provide for their children both material necessities and emotional needs, therefore, they prove themselves to be meaningful source of social support for their children. The degree of support children perceive from their parents may reflect the relationship between the support recipients (children) and the supporters (parents). Future studies that may contribute to deepen and broaden the knowledge obtained through the present study include finding the most important determinants of perceived support from mother/father toward their children/adolescents; examining the links between types of perceived support and self-concept components such as self-esteem; investigating relationships between self-concept and health-related behaviors such eating behavior or physical activity behaviors; and examining both short- and long- term relationships between the development of self-concept and various health outcomes.

CHAPTER IX

CONCLUSION

Parenting style has long been studied, and it may be one of the most complex of sociological/societal issues. This is due to a number of factors. It is a common belief that parents are one of the most influential components in a child or adolescent's developmental course. Numerous studies have dealt with the associations between parenting styles and children's/adolescents' developmental outcomes, such as psychosocial adjustment, academic performance, and behavioral problems. Despite the wealth of research in this field, the link between perceived parenting behaviors and the nutritional status and other health outcomes of adolescents has largely been neglected. Much effort has been invested in understanding parental roles in the development of eating habits and physical outcomes in young children, but these efforts have largely overlooked important issues such as how general parenting styles are associated with older children and adolescents' health. It is of great importance that we understand how children's/adolescents' health-related behaviors affect their health in adulthood. In addition, a clear understanding is necessary on how children/adolescents develop a positive self-concept, learn health-promoting eating patterns, and develop positive physical activity habits as they progress through the lifecycle. The general changes that occur during the transition from mid-childhood into older childhood and young adolescence must be considered; these include their increasing purchasing power, individuation and autonomy striving, growing interest in problematic behaviors, dramatic divergence between genders in various developmental domains, and/or frequent friction with parents. It is reasonable to consider the effects of children's/adolescents' perceptions of their mother's/father's parenting behaviors on youths' health-related behaviors and health outcomes.

Findings of the present study lent some insights into the question of whether parenting style and its relevant dimensions are associated with children's/adolescents' health outcomes. The following is a brief summary of the present study.

1. Statistical techniques of cluster analysis were utilized to classify study subjects based on their perception of parenting style. Two parenting styles were named for both maternal and paternal parenting style: authoritative versus non-authoritative. Adolescents and female subjects were more likely to perceive their mothers/fathers to be authoritative compared with children and male subjects. Although the authoritative parenting style shared many common features with both maternal and paternal parenting style regardless of child's age and gender, some differential characteristics of maternal/paternal parenting style dimensions emerged between children and adolescents and between male and female subjects. Examination of the case in which both parents are authoritative (BA) showed that authoritative mothers exhibited higher achievement expectations for their children, but not for their adolescents, while authoritative fathers exerted greater control over their adolescents, but less control over their children. Also, authoritative mothers exerted lower control over their children and adolescents, and authoritative fathers exerted higher achievement expectations in dealing with both their children and adolescents, compared with non-authoritative mothers/fathers. When both

male and female subjects perceived that both parents behaved authoritatively, authoritative mothers and fathers exerted higher control and more frequently punished by withholding privileges from their male children, but not from their female children. Types and degrees of punishments adopted by authoritative mothers and fathers seemed to be influenced by their spouses' authoritativeness. Mothers tended to punish their sons more frequently, but fathers punished their sons less frequently in both authoritative parents' homes. Generally speaking, authoritative mothers and fathers tended to use a higher level of warmth, praise, help, clear behavioral control, and maturity expectation for both pre-adolescent and adolescent children, as well as for male and female children, whereas a lower degree of parental control dimension was applied to adolescents and females than the level of control dimensions used over children and males. In conclusion, this study provides evidence that maternal and paternal parenting behaviors may be adapted for children's gender and developmental stages.

2. This study confirmed that an authoritative style may be desirable for the development of a healthy self-concept among children, which is in general agreement with the literature. However, authoritative parenting style exercised by mothers, fathers, or both parents were not associated with adolescents' self-concept, except for the association between the MA style and adolescents' self perception of overweight. Regarding children's/adolescents' eating behaviors, physical activity behaviors, and energy and nutrient intakes, maternal and paternal authoritative parenting style appeared to have somewhat contradictory results because of their desirable, undesirable, or non-significant effects on different types of health outcomes. For subjects' physical

outcomes, parenting style seemed to lack a direct association, except for the negative association between authoritative mothering (MA) and adolescents' body fatness. More specifically, MA, FA, and BA all appeared to be desirable for children's development of a healthy self-concept, while children's eating and physical activity behaviors and physical outcomes were not associated with parenting style. Maternal authoritativeness had a desirable effect on adolescents' self-concept and body measurements, whereas FA had a desirable effect on adolescents' physical activity behaviors. BA was positively associated with adolescents' physical outcomes, but not in children. In the contrast between male and female subjects, MA, FA, and BA all had mixed effects when various health outcomes were taken into account, whereas BA was associated with desirable health outcomes in terms of female subjects' self-concept, eating behaviors, and energy and nutrient intake. The FA style was highlighted due to its desirable impacts on both male and female subjects' self-concept as well as their eating behaviors. As a whole, the study suggests that authoritative parenting style exerted by mothers, fathers, or both parents may have different health impacts when children's/adolescents' age and their gender are taken into account.

3. With respect to the parenting style dimensions, both maternal and paternal nurturing were associated with desirable outcomes, but parental control had undesirable effects on children's/adolescents' health in general, but children's/adolescents' age (9-11 years versus 13-15 years) and gender moderated many of these associations. For instance, maternal control was positively associated with the eating behaviors of adolescents and for the energy and nutrient intake of adolescents and male subjects.

Also, maternal/paternal nurturing was detrimental to males' physical activity behaviors, but beneficial for females'. Overall, the study discovered that children's/adolescents' age and gender are critical factors in the association among maternal/paternal nurturing/control and youth's health-related behaviors such as eating behaviors, physical activity behaviors, and energy and nutrient intake. Nonetheless, parental nurturing (both maternal and paternal) was generally beneficial and parental control was largely detrimental to the self-concept of older children and young adolescents as well as male and female subjects. In conclusion, the findings suggest that maternal/paternal nurturing may have positive impacts on youth' self-concept; however, a higher level of maternal/paternal nurturing can promote males' increased sedentary activities. Also, maternal/paternal control appeared to be generally detrimental to older children's and young adolescents' self-concept, but a higher level of maternal control may result in desirable eating behaviors or energy and nutrient intake profile for adolescents and male subjects.

4. Causal modeling was used to examine the effects of parenting behaviors on youth health outcomes, especially self-concept, eating behaviors, and physical activity behaviors. Family meal behaviors were included as mediators using path analysis method. The findings of path analysis added some evidence of indirect effects of parenting behaviors on the subjects' health outcomes, and some family meal behaviors proved to be statistically significant as mediators. For instance, the child's perception of a family dinner ritual appeared to be the most significant mediator of maternal/paternal nurturing. The most fruitful outcome of the present study is the finding that parenting

behaviors may affect children’s/adolescents’ health, directly and/or indirectly, via family meal behaviors.

5. When examining the overall effects of parenting style dimensions on self-concept, eating behaviors, and physical activity behaviors, paternal nurturing appeared to be the most desirable parenting behavior in adolescents, male subjects, and female subjects. Also, parental nurturing had positive impacts on children’s self-concept. For parental impacts on subjects’ energy and nutrient intake, maternal nurturing, parental nurturing, and maternal control/paternal nurturing appeared to be the most important predictor(s) of the children’s, adolescents’, and male subjects’ analyses, respectively. For females’ energy and nutrient intake, paternal control was important because of its detrimental effects. For subjects’ physical outcomes, maternal nurturing was negatively associated, but maternal control was positively associated with adolescents’ body fatness. Additionally, paternal control was the positive predictor of males’ body fatness.

6. The findings from this study suggest the need to emphasize the significant role that paternal parenting style and its dimensions play in children’s/adolescents’ health. In particular, fathers’ positive roles in improving male/female subjects’ physical activity behaviors need to be understood, given growing public attention to the link between decreased physical activity and/or increased sedentary activities and the rising national obesity epidemic.

7. Particular attention was paid to an examination of the roles family meal behaviors play in children’s/adolescents’ health outcomes, using multiple regression analysis. The frequency of children’s/adolescents’ participation in family breakfast,

frequency of children’s/adolescents’ participation in family dinner, and children’s/adolescents’ perception that dinner was a family ritual appeared to be beneficial, but lack of food pressure from parents and paternal criticism of the children’s/adolescents’ eating were detrimental to the subjects’ health outcomes. The frequency of children’s/adolescents’ participation in family lunches and the frequency of children’s/adolescents’ participation in family dinners away from home had mixed effects, but these were largely detrimental. Parental provision of the children’s/adolescents’ favorite foods tended to have positive effects on female subjects’ health outcomes, compared with its impacts on other groups. Maternal criticism of children’s eating was generally detrimental, but was largely beneficial in terms of males’ eating behaviors. Of great interest in this study was that lack of food pressure from parents appeared to be extensively detrimental for eating behaviors and essential nutrient intakes in all of the study groups, and especially detrimental for adolescents.

Overall, the findings of the present study should encourage other researchers to broaden the study of relationships between perceived parenting behaviors and children’s/adolescents’ health-related behaviors and health outcomes. Additionally, the present study demonstrated that gender also play an important role in the associations between parenting behaviors and children’s/adolescents’ health outcomes, based on the differential impacts of maternal versus paternal parenting behaviors on male versus female children’s/adolescents’ health outcomes.

The notion that parents are the “providers” and children are the “recipients” in their relationship is generally appealing. Nonetheless, it is likely that parents and children interact with one another, rather than a situation in which parents communicate, but don't listen and children/adolescents listen but don't communicate. Accordingly, investigators who describe the relationship between parental behaviors and children's developmental status must exert caution when interpreting their findings, because the potential for mutual relationships cannot be exclusively ruled out in either a cross-sectional examination or even in a longitudinal investigation. Observational studies of parent-child interactions, similar to those performed in the study "Families in Troubled Times" by Conger and Elder (247) could be employed. In addition, the efforts to determine the effects of parenting styles and relevant parenting practices must be considered in the context of culture and society, as a given parenting style can be differently interpreted across cultures and societies.

Finally, the nature of behavioral research, including the present study, often interferes with drawing a simple conclusion. While multiple messages resulted from this study, the final word may simply be that perceived parenting behaviors are extremely significant for both older children's and young adolescents' health outcomes. More research is needed to fully investigate the impacts of perceived parenting behaviors on development and health outcomes in young people. Health experts are responsible for providing the parents with knowledge regarding the possible gap between parents' own perceived parenting behaviors and children's perceptions of this parenting. An equally important role for health professionals is to advise parents about optimal parenting strategies in order to promote a healthful transition into adolescence and to ensure the optimal health status of children.

It is presumed that beliefs and attitudes of child-rearing practices may be inherited from generation to generation. If this is true, children/adolescents raised in an atmosphere of a certain parenting style exercised by their mothers or fathers are more likely to adopt a very similar parenting style in dealing with their own children. Likewise, potential health impacts of a given parenting style can thus be anticipated in regard to health outcomes in children in the next generation. Given that the obesity epidemic within the U.S. is not only limited to the adult generation but has also spread to the next generation, optimal parenting behaviors adopted by mothers and fathers might be one of the most reliable, long-term strategies for curbing the nation's growing obesity epidemic and for promoting a healthy lifestyle from one generation to the next.

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APPENDIX A

CLUSTER ANALYSIS

- FIGURES 6-1 TO 6-8 AND TABLES 6-1 TO 6-9

LIST OF FIGURES

LIST OF TABLES

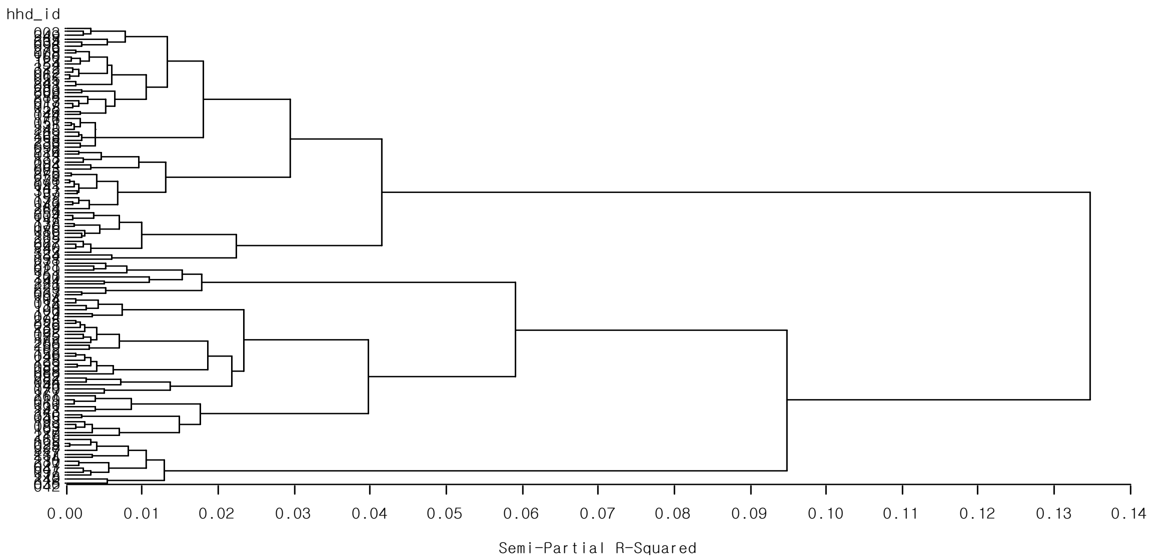

Figure 6-1. SAS output of cluster analysis for children's perception of mother's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

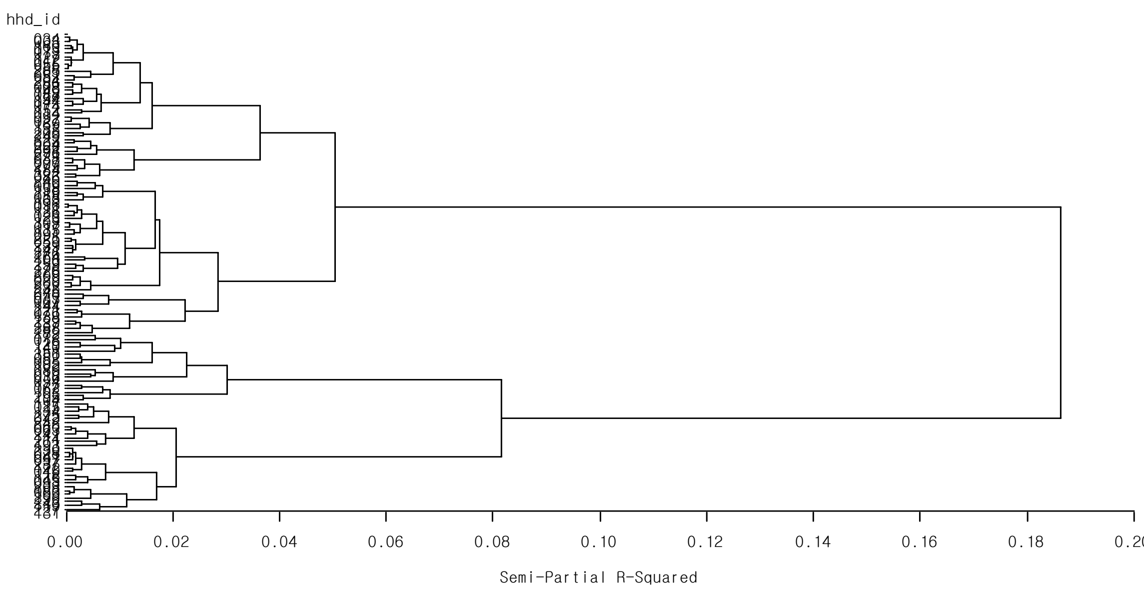

Figure 6-2. SAS output of cluster analysis for children's perception of father's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

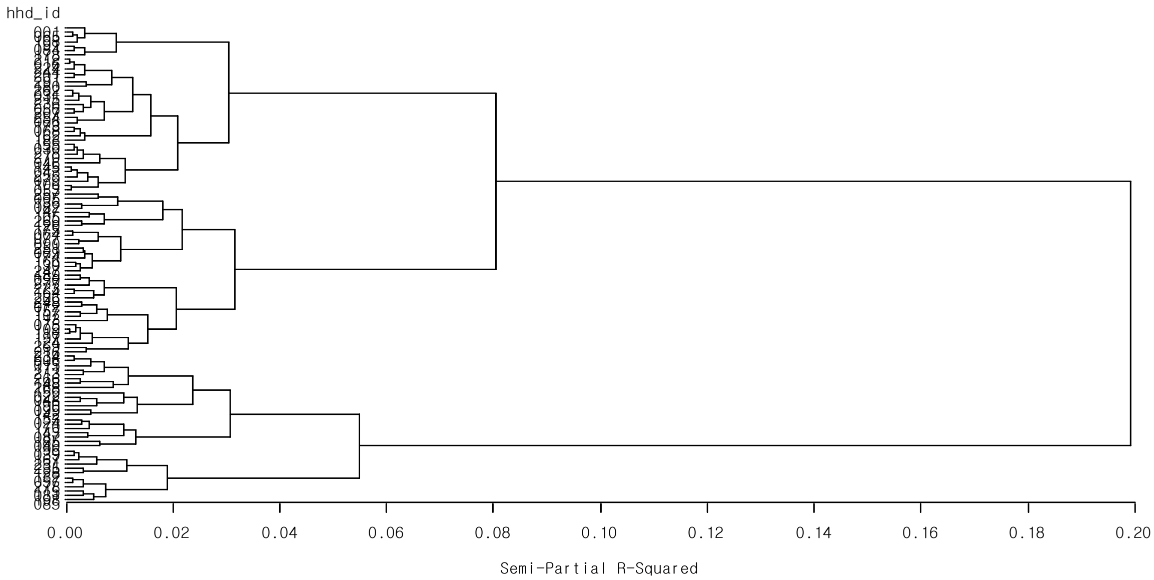

Figure 6-3. SAS output of cluster analysis for adolescents' perception of mother's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

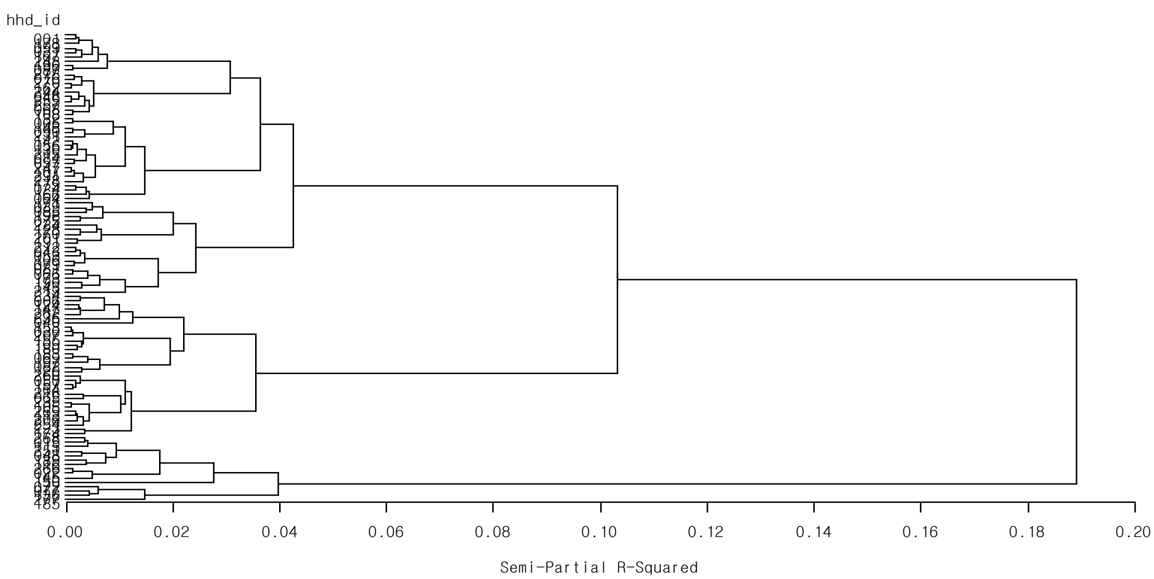

Figure 6-4. SAS output of cluster analysis for adolescents' perception of father's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

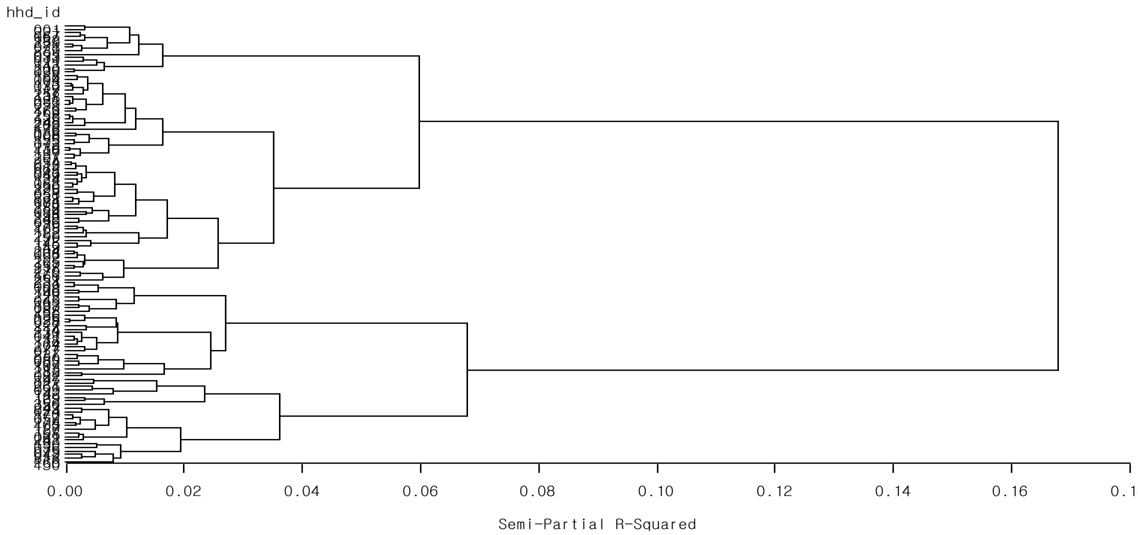

Figure 6-5. SAS output of cluster analysis for male subjects' perception of mother's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

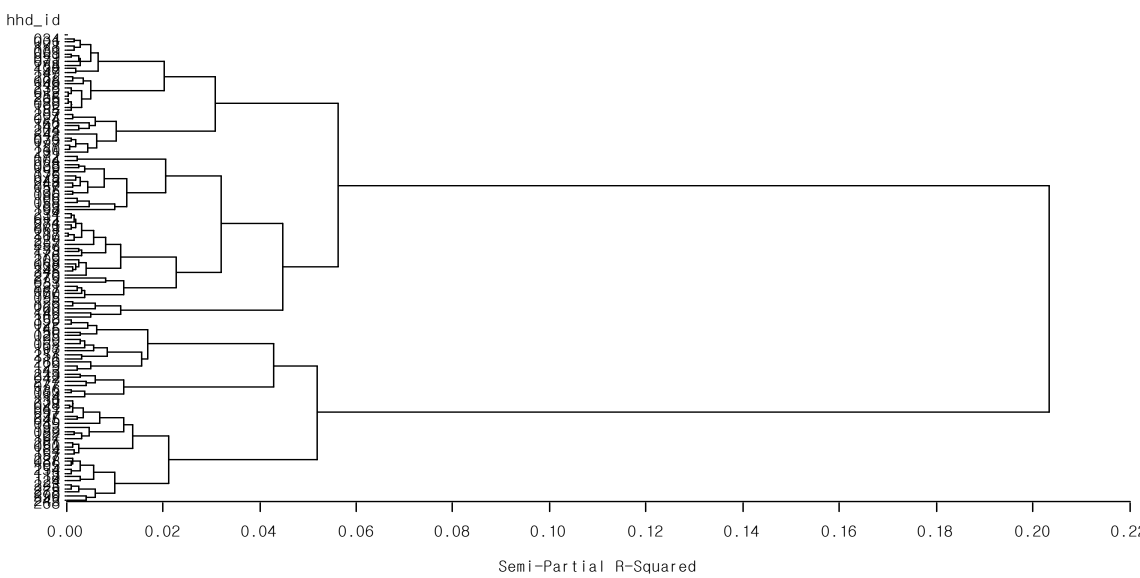

Figure 6-6. SAS output of cluster analysis for male subjects' perception of father's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

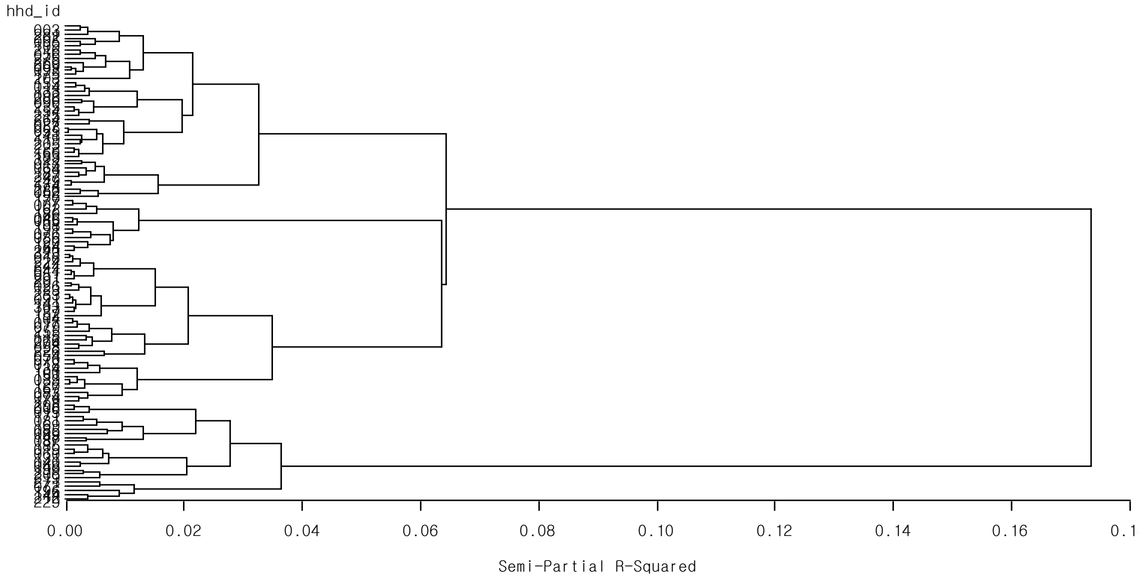

Figure 6-7. SAS output of cluster analysis for female subjects' perception of mother's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

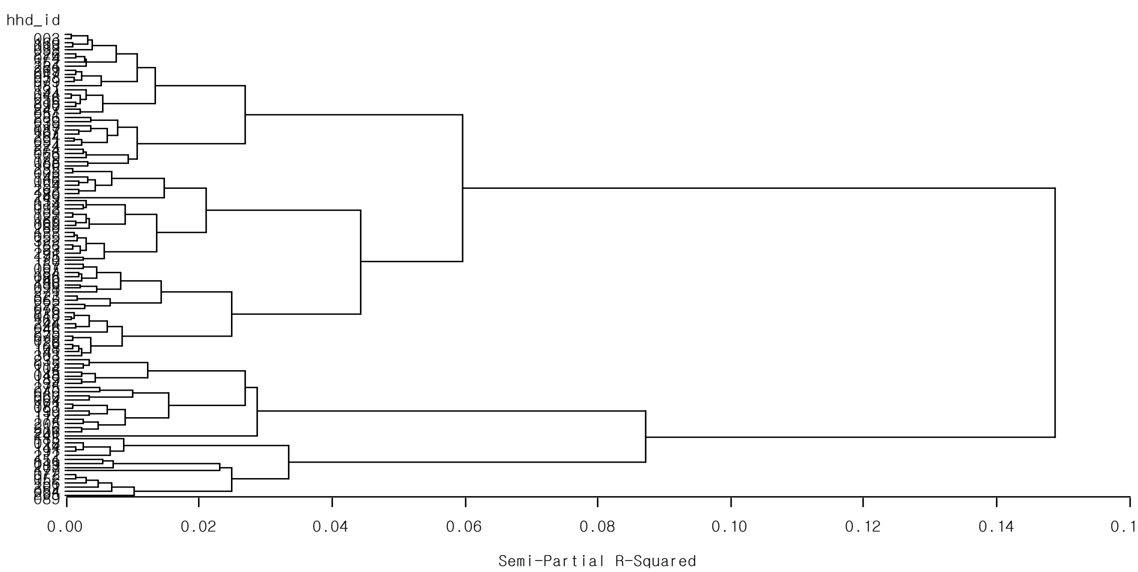

Figure 6-8. SAS output of cluster analysis for female subjects' perception of father's parenting style (dendrogram). hhd_id: identification number of household. Each family participated in the survey received a number to be recognized, thus parents and a child from each household shared the same household identification number

Table 6-1. List of questions regarding maternal/paternal parenting behaviors drawn from survey instruments and corresponding parenting style dimension variables

She/He comforts and helps when I have problems. She/He makes me feel I can talk with her/him about everything. She/He makes me feel she/he is there if I need her/him.	**Care**
When she/he punishes me, she/he explains why. When she/he wants me to do something, she/he explains why. I know what she/he expects of me and how she/he wants me to behave. When I do something she/he doesn't like, I know exactly what to expect of her/him.	**Clear behavioral regulation**
She/He helps me with homework or lessons if there is something I don't understand. She/He teaches me things I want to learn.	**Help**
She/He encourages me to try things on my own. She/He lets me make my own plans about things I want to do even though I might make a few mistakes	**Maturity expectations**
She/He lets me off lightly when I do something wrong. She/He cannot bring herself/himself to punish me.	**Lack of punishment**
She/He expects me to keep my things neat. She/He expects me to help around the house or yard. She/He keeps after me to do well in school. She/He keeps after me to do better than other children.	**High achievement expectations**
She/He wants to know exactly when I am going when I go out. She/He expects me to tell her exactly how I spend my money. She/He worries that I cannot take care of myself. She/He won't let me go places because something might happen to me.	**Immaturity expectations**
When I do something she/he doesn't like, she/he acts hurt and disappointed. She/He punishes me by trying to make me feel guilty and shamed. Your mother/father discipline by criticizing, or making fun of you.	**Psychological punishment**
She/He punishes me by not allowing me to be with my friend. She/He punishes me by not letting me use my favorite things for a while.	**Punishment by withholding privileges**
My mother/father discipline or punish me by nagging, yelling, scolding. My mother/father discipline or punish me by spanking, slapping or hitting me.	**Harsh punishment**
My mother/father gives me praise, encouragement, or approval.	**Praise**

Table 6-2. SAS output of cluster analysis for children's perception of mother's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL30	CL47	5	0.01	0.57	9.8	2.7
15	CL87	CL33	7	0.01	0.56	10.0	4.5
14	CL27	CL20	7	0.02	0.54	10.2	2.3
13	CL25	CL15	12	0.02	0.52	10.4	3.6
12	CL14	CL44	10	0.02	0.50	10.6	2.6
11	CL17	CL56	34	0.02	0.49	11.0	5.6
10	CL31	CL36	16	0.02	0.47	11.4	5.9
9	CL10	CL16	21	0.02	0.45	11.8	4.5
8	CL23	CL38	14	0.02	0.42	12.5	6.1
7	CL29	CL9	27	0.02	0.40	13.3	4.4
6	CL11	CL18	51	0.03	0.37	14.2	8.1
5	CL7	CL13	39	0.04	0.33	15.0	6.7
4	CL6	CL8	65	0.04	0.29	16.6	9.5
3	CL12	CL5	49	0.06	0.23	18.5	8.3
2	CL3	CL19	62	0.09	0.14	19.5	12.5
1	CL4	CL2	127	0.13	0.00	.	19.5

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R^2, e: R^2, f: pseudo F, g: pseudo t^2.

Table 6-3. SAS output of cluster analysis for children's perception of father's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL40	CL37	11	0.01	0.58	9.9	4.0
15	CL24	CL36	21	0.01	0.56	10.2	5.3
14	CL15	CL28	27	0.02	0.55	10.3	4.8
13	CL21	CL27	9	0.02	0.53	10.6	2.7
12	CL33	CL20	25	0.02	0.51	10.9	4.9
11	CL31	CL19	17	0.02	0.50	11.3	5.1
10	CL12	CL48	30	0.02	0.48	11.8	4.7
9	CL17	CL11	29	0.02	0.46	12.3	4.6
8	CL29	CL18	11	0.02	0.44	13.0	4.9
7	CL13	CL25	13	0.02	0.41	14.0	3.3
6	CL10	CL8	41	0.03	0.39	15.0	6.0
5	CL7	CL26	18	0.03	0.35	16.6	4.0
4	CL14	CL16	38	0.04	0.32	19.0	9.3
3	CL4	CL6	79	0.05	0.27	22.5	9.9
2	CL5	CL9	47	0.08	0.19	28.4	12.6
1	CL3	CL2	126	0.19	0.00	.	28.4

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

Table 6-4. SAS output of cluster analysis for adolescents' perception of mother's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL22	CL36	7	0.01	0.60	8.8	2.3
15	CL23	CL47	6	0.01	0.58	9.1	2.2
14	CL29	CL19	12	0.02	0.57	9.3	3.4
13	CL17	CL58	19	0.02	0.55	9.5	4.4
12	CL25	CL32	8	0.02	0.53	9.8	3.3
11	CL20	CL30	12	0.02	0.51	10.1	4.2
10	CL34	CL14	18	0.02	0.49	10.4	4.1
9	CL13	CL21	30	0.02	0.47	10.9	5.1
8	CL12	CL24	18	0.02	0.45	11.5	4.0
7	CL18	CL15	14	0.02	0.43	12.3	3.7
6	CL26	CL9	37	0.03	0.40	13.2	6.7
5	CL7	CL16	21	0.03	0.37	14.6	4.1
4	CL8	CL10	36	0.03	0.34	17.1	5.1
3	CL5	CL11	33	0.05	0.28	20.0	7.2
2	CL6	CL4	73	0.08	0.20	25.9	13.3
1	CL2	CL3	106	0.20	0.00	.	25.9

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

Table 6-5. SAS output of cluster analysis for adolescents' perception of father's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL34	185	4	0.01	0.64	10.7	2.8
15	CL19	CL43	19	0.01	0.63	10.8	4.5
14	CL55	CL20	11	0.02	0.61	11.0	4.4
13	CL24	CL38	10	0.02	0.59	11.2	3.8
12	CL58	CL32	11	0.02	0.57	11.4	7.1
11	CL29	CL30	10	0.02	0.55	11.6	4.6
10	CL17	CL12	18	0.02	0.53	12.0	4.3
9	CL11	CL14	21	0.02	0.51	12.4	4.3
8	CL13	72	11	0.03	0.48	12.8	4.6
7	CL26	CL37	19	0.03	0.45	13.3	10.0
6	CL10	CL18	32	0.04	0.41	13.9	6.6
5	CL7	CL15	38	0.04	0.37	15.1	8.5
4	CL8	CL16	15	0.04	0.34	17.1	4.8
3	CL5	CL9	59	0.04	0.29	21.3	7.5
2	CL3	CL6	91	0.10	0.19	24.3	16.4
1	CL2	CL4	106	0.19	0.00	.	24.3

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

Table 6-6. SAS output of cluster analysis for male subjects' perception of mother's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL56	CL52	7	0.01	0.57	9.4	4.3
15	CL48	CL32	5	0.02	0.55	9.5	2.7
14	CL18	CL35	24	0.02	0.54	9.7	5.2
13	CL17	CL38	14	0.02	0.52	9.9	3.4
12	CL24	CL77	7	0.02	0.50	10.2	3.8
11	CL19	CL16	25	0.02	0.49	10.6	4.5
10	CL22	CL26	16	0.02	0.47	11.0	4.2
9	CL15	CL37	8	0.02	0.44	11.4	3.4
8	CL27	CL12	18	0.02	0.42	11.9	5.1
7	CL11	CL25	34	0.03	0.39	12.6	6.2
6	CL20	CL8	27	0.03	0.37	13.5	4.9
5	CL14	CL7	58	0.04	0.33	14.6	8.1
4	CL9	CL10	24	0.04	0.30	16.6	5.3
3	CL13	CL5	72	0.06	0.24	18.5	11.9
2	CL6	CL4	51	0.07	0.17	24.4	9.4
1	CL3	CL2	123	0.17	0.00	.	24.4

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

Table 6-7. SAS output of cluster analysis for male subjects' perception of father's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL32	CL54	7	0.01	0.61	10.9	3.3
15	CL27	CL23	13	0.01	0.59	11.2	3.2
14	CL17	CL74	15	0.01	0.58	11.5	4.1
13	CL24	CL42	9	0.02	0.56	11.8	3.5
12	CL30	CL13	14	0.02	0.55	12.1	3.3
11	CL29	CL40	20	0.02	0.53	12.4	8.3
10	CL80	CL15	15	0.02	0.51	12.8	4.6
9	CL14	CL22	27	0.02	0.49	13.3	5.5
8	CL19	CL18	23	0.02	0.46	14.0	5.9
7	CL11	CL21	31	0.03	0.43	14.5	8.6
6	CL10	CL8	38	0.03	0.40	15.4	6.3
5	CL12	CL16	21	0.04	0.36	16.2	7.4
4	CL6	CL20	43	0.04	0.31	17.8	7.7
3	CL5	CL9	48	0.05	0.26	20.9	8.9
2	CL7	CL4	74	0.06	0.20	30.6	9.7
1	CL2	CL3	122	0.20	0.00	.	30.6

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

Table 6-8. SAS output of cluster analysis for female subjects' perception of mother's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL27	CL22	14	0.01	0.58	9.3	3.0
15	CL29	CL35	10	0.01	0.57	9.6	3.4
14	CL49	CL38	16	0.02	0.55	9.8	7.3
13	CL34	CL42	10	0.02	0.54	10.1	4.4
12	CL20	CL23	19	0.02	0.52	10.2	5.1
11	CL31	CL39	9	0.02	0.50	10.5	4.9
10	CL14	CL15	26	0.02	0.48	10.8	5.6
9	CL16	CL12	33	0.02	0.46	11.3	4.4
8	CL56	CL17	10	0.02	0.43	11.9	3.8
7	CL8	CL11	19	0.03	0.41	12.5	4.0
6	CL9	CL13	43	0.03	0.37	13.2	6.2
5	CL10	CL19	37	0.04	0.34	14.3	8.0
4	CL7	CL21	24	0.04	0.30	16.3	4.6
3	CL18	CL5	50	0.06	0.24	17.8	12.8
2	CL6	CL3	93	0.06	0.17	24.2	10.6
1	CL2	CL4	117	0.17	0.00	.	24.2

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

Table 6-9. SAS output of cluster analysis for female subjects' perception of father's parenting style (Ward's minimum variance method was used following the k-means method.)

NCL[a]	Clusters joined[b]		FREQ[c]	SPRSQ[d]	RSQ[e]	PSF[f]	PST2[g]
16	CL24	CL39	16	0.01	0.60	9.9	4.7
15	CL28	CL34	12	0.01	0.58	10.1	3.8
14	CL33	153	8	0.01	0.57	10.3	4.6
13	CL22	CL25	12	0.02	0.55	10.6	3.2
12	CL14	CL16	24	0.02	0.53	10.7	5.3
11	CL31	72	4	0.02	0.51	10.8	3.6
10	CL11	CL21	10	0.02	0.48	11.0	3.2
9	CL15	CL27	24	0.02	0.46	11.3	6.6
8	CL17	CL19	34	0.03	0.43	11.7	6.7
7	CL18	CL13	19	0.03	0.40	12.3	5.1
6	CL7	185	20	0.03	0.37	13.2	4.4
5	CL26	CL10	15	0.03	0.34	14.4	4.1
4	CL12	CL9	48	0.04	0.30	15.8	9.4
3	CL8	CL4	82	0.06	0.24	17.6	11.4
2	CL6	CL5	35	0.09	0.15	20.1	10.0
1	CL3	CL2	117	0.15	0.00	.	20.1

a: number of cluster history. This table shows only the last 16 lines of clustering history, i.e., NCL 1 means the last-formed cluster that contains the total observations in it, b: each set of two clusters were joined to produce corresponding bigger cluster, c: number of observations in each NCL, d: semipartial R2, e: R2, f: pseudo F, g: pseudo t2.

APPENDIX B

CHARACTERISTICS OF AUTHORITATIVE PARENTING STYLE VERSUS NON-AUTHORITATIVE PARENTING STYLE

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Table 6-10. Group means for perceived maternal/paternal parenting style dimensions between MA and MNA as well as FA and FNA in children

Variables	**Maternal**		**Paternal**	
	MA (N=65)	**MNA (N=62)**	**FA (N=79)**	**FNA (N=47)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.62 (0.42)	4.73 (1.01)	5.22 (0.82)	3.88 (1.13)
Clear behavioral regulation	5.04 (0.60)	4.32 (0.96)	5.00 (0.75)	4.00 (0.89)
Help	5.52 (0.57)	4.58 (1.22)	5.39 (0.69)	4.12 (1.23)
Maturity expectations	4.74 (0.91)	3.91 (1.24)	4.70 (1.02)	3.49 (1.09)
Lack of punishment	2.90 (1.16)	2.52 (1.01)	2.77 (1.27)	1.99 (1.00)
High achievement expectations	4.65 (0.79)	4.31 (0.81)	4.63 (0.85)	3.78 (0.86)
Immaturity expectations	3.79 (0.75)	4.15 (1.01)	3.60 (0.92)	3.52 (1.32)
Psychological punishment	1.96 (0.56)	2.72 (0.92)	1.97 (0.84)	2.46 (1.25)
Punishment by withholding privileges	2.42 (1.04)	3.31 (1.20)	2.65 (1.31)	3.05 (1.30)
Harsh punishment	1.95 (0.53)	2.56 (0.84)	1.90 (0.66)	2.53 (0.82)
Praise	4.40 (0.72)	3.87 (0.76)	4.35 (0.66)	3.17 (0.79)
Parent-alone decision making	0.17 (0.38)	0.44 (0.50)	0.20 (0.40)	0.49 (0.51)
Parent-child shared decision making	0.65 (0.48)	0.45 (0.50)	0.59 (0.49)	0.38 (0.49)
Child-alone decision making	0.18 (0.39)	0.11 (0.32)	0.20 (0.40)	0.11 (0.31)

MA: mother's authoritative style, MNA: mother's non-authoritative style, FA: father's authoritative style, FNA: father's non-authoritative style

Table 6-11. Group means for perceived maternal/paternal parenting style dimensions between BA and OPNA in children

Variables	Maternal		Paternal	
	BA (N=56)	**OPNA (N=71)**	**BA (N=56)**	**OPNA (N=71)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.64 (0.42)	4.83 (0.98)	5.24 (0.80)	4.30 (1.21)
Clear behavioral regulation	5.16 (0.51)	4.32 (0.92)	5.03 (0.72)	4.31 (0.98)
Help	5.54 (0.56)	4.68 (1.19)	5.35 (0.69)	4.56 (1.26)
Maturity expectations	4.77 (0.95)	3.99 (1.19)	4.71 (0.99)	3.88 (1.22)
Lack of punishment	2.88 (1.18)	2.59 (1.03)	2.72 (1.33)	2.28 (1.12)
High achievement expectations	4.72 (0.80)	4.31 (0.79)	4.68 (0.84)	4.02 (0.93)
Immaturity expectations	3.90 (0.70)	4.02 (1.03)	3.46 (0.88)	3.64 (1.22)
Psychological punishment	1.99 (0.58)	2.60 (0.93)	1.73 (0.65)	2.50 (1.16)
Punishment by withholding privileges	2.50 (1.07)	3.13 (1.23)	2.33 (1.13)	3.18 (1.34)
Harsh punishment	1.93 (0.54)	2.51 (0.81)	1.79 (0.59)	2.41 (0.81)
Praise	4.50 (0.66)	3.86 (0.74)	4.32 (0.66)	3.59 (0.96)
Parent-alone decision making	0.16 (0.37)	0.41 (0.50)	0.18 (0.39)	0.41 (0.50)
Parent-child shared decision making	0.63 (0.49)	0.49 (0.50)	0.59 (0.50)	0.46 (0.50)
Child-alone decision making	0.21 (0.41)	0.10 (0.30)	0.23 (0.43)	0.11 (0.32)

BA: both parents' authoritative style, OPNA:at least one parent's non-authoritative style

Table 6-12. Group means for perceived maternal/paternal parenting style dimensions between MA and MNA as well as FA and FNA in adolescents

Variables	**Maternal**		**Paternal**	
	MA (N=73)	**MNA (N=33)**	**FA (N=91)**	**FNA (N=15)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.07 (0.84)	4.20 (1.14)	4.67 (1.00)	1.96 (0.76)
Clear behavioral regulation	4.92 (0.67)	4.22 (0.82)	4.81 (0.79)	3.33 (1.01)
Help	4.68 (1.20)	3.80 (1.48)	4.88 (1.15)	2.80 (1.05)
Maturity expectations	4.77 (0.89)	3.79 (1.04)	4.50 (0.98)	2.90 (0.71)
Lack of punishment	2.88 (0.83)	2.00 (0.60)	2.58 (1.09)	1.67 (0.65)
High achievement expectations	4.62 (0.85)	4.94 (0.88)	4.55 (0.92)	4.25 (1.44)
Immaturity expectations	3.37 (0.88)	3.90 (1.05)	3.22 (0.99)	2.93 (1.12)
Psychological punishment	2.00 (0.65)	2.84 (0.89)	1.88 (0.76)	2.67 (1.23)
Punishment by withholding privileges	2.50 (1.05)	4.47 (0.96)	3.01 (1.35)	3.23 (1.33)
Harsh punishment	1.79 (0.42)	2.73 (0.49)	1.94 (0.55)	2.57 (0.94)
Praise	4.16 (0.65)	3.73 (0.67)	3.96 (0.61)	2.33 (0.90)
Parent-alone decision making	0.16 (0.37)	0.33 (0.48)	0.30 (0.46)	0.64 (0.50)
Parent-child shared decision making	0.62 (0.49)	0.55 (0.51)	0.51 (0.50)	0.21 (0.43)
Child-alone decision making	0.22 (0.42)	0.12 (0.33)	0.20 (0.40)	0.07 (0.27)

MA: mother's authoritative style, MNA: mother's non-authoritative style, FA: father's authoritative style, FNA: father's non-authoritative style

Table 6-13. Group means for perceived maternal/paternal parenting style dimensions between BA and OPNA in adolescents

Variables	Maternal		Paternal	
	BA (N=65)	**OPNA (N=41)**	**BA (N=65)**	**OPNA (N=41)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.17 (0.79)	4.21 (1.07)	4.73 (1.01)	3.59 (1.54)
Clear behavioral regulation	4.93 (0.65)	4.33 (0.84)	4.77 (0.79)	4.32 (1.15)
Help	4.74 (1.15)	3.88 (1.49)	5.08 (1.00)	3.80 (1.46)
Maturity expectations	4.82 (0.90)	3.89 (0.98)	4.61 (0.90)	3.74 (1.19)
Lack of punishment	2.88 (0.83)	2.16 (0.73)	2.55 (0.93)	2.28 (1.29)
High achievement expectations	4.68 (0.86)	4.79 (0.88)	4.48 (0.92)	4.55 (1.14)
Immaturity expectations	3.39 (0.86)	3.77 (1.07)	3.24 (1.01)	3.09 (1.02)
Psychological punishment	1.99 (0.64)	2.69 (0.91)	1.81 (0.72)	2.27 (1.04)
Punishment by withholding privileges	2.48 (1.03)	4.12 (1.23)	2.68 (1.13)	3.60 (1.48)
Harsh punishment	1.81 (0.43)	2.52 (0.61)	1.88 (0.51)	2.26 (0.79)
Praise	4.22 (0.62)	3.73 (0.67)	3.97 (0.56)	3.34 (1.11)
Parent-alone decision making	0.15 (0.36)	0.32 (0.47)	0.28 (0.45)	0.45 (0.50)
Parent-child shared decision making	0.63 (0.49)	0.54 (0.50)	0.54 (0.50)	0.35 (0.48)
Child-alone decision making	0.22 (0.41)	0.15 (0.36)	0.18 (0.39)	0.18 (0.38)

BA: both parents' authoritative style, OPNA:at least one parent's non-authoritative style

Table 6-14. Group means for perceived maternal/paternal parenting style dimensions between MA and MNA as well as FA and FNA in male subjects

Variables	Maternal		Paternal	
	MA (N=72)	MNA (N=51)	FA (N=74)	FNA (N=48)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.38 (0.50)	4.14 (0.96)	5.25 (0.80)	3.65 (1.21)
Clear behavioral regulation	5.05 (0.55)	3.96 (0.85)	5.10 (0.60)	3.72 (0.64)
Help	5.28 (0.86)	3.88 (1.08)	5.34 (0.80)	3.81 (1.14)
Maturity expectations	4.83 (0.92)	3.48 (0.97)	4.68 (0.95)	3.38 (0.79)
Lack of punishment	2.78 (0.83)	2.46 (1.05)	2.35 (1.04)	2.31 (1.06)
High achievement expectations	4.92 (0.77)	4.29 (0.84)	4.78 (0.84)	3.93 (0.85)
Immaturity expectations	3.89 (0.88)	3.72 (1.06)	3.66 (1.09)	3.07 (0.98)
Psychological punishment	2.25 (0.86)	2.40 (0.82)	2.14 (0.98)	2.08 (0.82)
Punishment by withholding privileges	3.05 (1.08)	3.20 (1.40)	3.30 (1.25)	2.93 (1.12)
Harsh punishment	2.14 (0.66)	2.31 (0.79)	2.07 (0.73)	2.28 (0.74)
Praise	4.26 (0.69)	3.63 (0.66)	4.14 (0.69)	3.25 (0.84)
Parent-alone decision making	0.24 (0.43)	0.33 (0.48)	0.28 (0.45)	0.46 (0.50)
Parent-child shared decision making	0.60 (0.49)	0.49 (0.50)	0.57 (0.50)	0.44 (0.50)
Child-alone decision making	0.17 (0.38)	0.18 (0.39)	0.15 (0.36)	0.08 (0.28)

MA: mother's authoritative style, MNA: mother's non-authoritative style, FA: father's authoritative style, FNA: father's non-authoritative style

Table 6-15. Group means for perceived maternal/paternal parenting style dimensions between BA and OPNA in male subjects

Variables	Maternal		Paternal	
	BA (N=55)	**OPNA (N=67)**	**BA (N=55)**	**OPNA (N=67)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.50 (0.43)	4.33 (0.93)	5.30 (0.79)	4.06 (1.29)
Clear behavioral regulation	5.18 (0.49)	4.12 (0.84)	5.14 (0.57)	4.08 (0.87)
Help	5.39 (0.85)	4.12 (1.10)	5.44 (0.72)	4.17 (1.24)
Maturity expectations	4.92 (0.97)	3.74 (1.02)	4.81 (0.88)	3.64 (0.96)
Lack of punishment	2.72 (0.87)	2.59 (0.99)	2.46 (1.04)	2.23 (1.05)
High achievement expectations	5.06 (0.70)	4.33 (0.84)	4.89 (0.75)	4.08 (0.92)
Immaturity expectations	4.01 (0.88)	3.67 (1.00)	3.67 (1.04)	3.23 (1.08)
Psychological punishment	2.28 (0.91)	2.35 (0.80)	2.01 (0.86)	2.21 (0.96)
Punishment by withholding privileges	3.17 (1.07)	3.07 (1.34)	3.22 (1.21)	3.10 (1.22)
Harsh punishment	2.09 (0.69)	2.30 (0.74)	2.01 (0.69)	2.27 (0.76)
Praise	4.38 (0.68)	3.72 (0.62)	4.29 (0.60)	3.37 (0.83)
Parent-alone decision making	0.18 (0.39)	0.36 (0.48)	0.24 (0.43)	0.45 (0.50)
Parent-child shared decision making	0.63 (0.49)	0.48 (0.50)	0.62 (0.49)	0.43 (0.50)
Child-alone decision making	0.18 (0.39)	0.16 (0.37)	0.15 (0.36)	0.10 (0.31)

BA: both parents' authoritative style, OPNA:at least one parent's non-authoritative style

Table 6-16. Group means for perceived maternal/paternal parenting style dimensions between MA and MNA as well as FA and FNA in female subjects

Variables	Maternal		Paternal	
	MA (N=93)	**MNA (N=24)**	**FA (N=82)**	**FNA (N=35)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.42 (0.73)	4.24 (0.15)	4.94 (0.87)	3.26 (1.27)
Clear behavioral regulation	4.93 (0.70)	4.23 (0.77)	4.85 (0.81)	4.24 (1.17)
Help	5.23 (0.88)	3.38 (1.47)	5.21 (0.92)	3.93 (1.45)
Maturity expectations	4.78 (0.85)	3.58 (1.11)	4.06 (1.09)	3.77 (1.21)
Lack of punishment	2.77 (1.09)	2.27 (0.87)	2.73 (1.28)	2.30 (1.11)
High achievement expectations	4.45 (0.83)	4.78 (0.75)	4.44 (0.94)	4.20 (1.14)
Immaturity expectations	3.56 (0.84)	4.35 (1.10)	3.26 (0.91)	3.51 (1.32)
Psychological punishment	2.06 (0.67)	3.18 (0.72)	1.78 (0.68)	2.64 (1.34)
Punishment by withholding privileges	2.59 (1.15)	3.73 (1.59)	2.40 (1.22)	3.26 (1.59)
Harsh punishment	2.07 (0.66)	2.46 (0.62)	1.86 (0.55)	2.44 (0.86)
Praise	4.39 (0.59)	3.46 (0.66)	4.27 (0.61)	2.97 (0.89)
Parent-alone decision making	0.15 (0.36)	0.54 (0.51)	0.22 (0.42)	0.44 (0.50)
Parent-child shared decision making	0.65 (0.48)	0.38 (0.49)	0.55 (0.50)	0.32 (0.47)
Child-alone decision making	0.20 (0.41)	0.08 (0.28)	0.22 (0.42)	0.24 (0.43)

MA: mother's authoritative style, MNA: mother's non-authoritative style, FA: father's authoritative style, FNA: father's non-authoritative style

Table 6-17. Group means for perceived maternal/paternal parenting style dimensions between BA and OPNA in female subjects

Variables	Maternal		Paternal	
	BA (N=71)	**OPNA (N=46)**	**BA (N=71)**	**OPNA (N=46)**
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Care	5.55 (0.58)	4.59 (1.13)	5.00 (0.87)	3.57 (1.29)
Clear behavioral regulation	5.00 (0.68)	4.46 (0.78)	4.88 (0.79)	4.34 (1.13)
Help	5.25 (0.85)	4.23 (1.54)	5.27 (0.90)	4.13 (1.38)
Maturity expectations	4.89 (0.78)	4.00 (1.13)	4.71 (0.98)	3.80 (1.28)
Lack of punishment	2.84 (1.11)	2.41 (0.94)	2.69 (1.27)	2.46 (1.21)
High achievement expectations	4.51 (0.85)	4.52 (0.79)	4.39 (0.97)	4.33 (1.06)
Immaturity expectations	3.51 (0.80)	4.06 (1.06)	3.22 (0.88)	3.51 (1.26)
Psychological punishment	2.03 (0.63)	2.70 (0.90)	1.73 (0.62)	2.51 (1.27)
Punishment by withholding privileges	2.46 (1.12)	3.38 (1.44)	2.35 (1.16)	3.14 (1.58)
Harsh punishment	1.97 (0.60)	2.42 (0.68)	1.88 (0.54)	2.27 (0.85)
Praise	4.49 (0.56)	3.74 (0.68)	4.27 (0.58)	3.28 (1.03)
Parent-alone decision making	0.13 (0.34)	0.39 (0.49)	0.21 (0.41)	0.40 (0.50)
Parent-child shared decision making	0.65 (0.48)	0.50 (0.51)	0.55 (0.50)	0.38 (0.49)
Child-alone decision making	0.23 (0.42)	0.11 (0.31)	0.24 (0.43)	0.20 (0.40)

BA: both parents' authoritative style, OPNA:at least one parent's non-authoritative style

APPENDIX C

COMMOM FACTOR ANALYSIS

- TABLES 6-18 TO 6-37

LIST OF TABLES

Table 6-18. Common factor analysis of maternal/paternal parenting style dimensions in children group

	Factors			
	Mother's nurturing	**Father's nurturing**	**Mother's control**	**Father's control**
Care (m)	0.81			
Clear behavioral regulation (m)	0.74			
Help (m)	0.69			
Maturity expectations (m)	0.70			
Praise (m)	0.69			
High achievement expectations (m)	0.48			
Care (f)		0.81		
Clear behavioral regulation (f)		0.63		
Help (f)		0.78		
Maturity expectations (f)		0.66		
Praise (f)		0.77		
High achievement expectations (f)		0.49		
Immaturity expectations (m)			0.75	
Psychological punishment (m)			0.73	
Punishment by withholding privileges (m)			0.57	
Harsh punishment (m)			0.47	
Immaturity expectations (f)				0.67
Psychological punishment (f)				0.71
Punishment by withholding privileges (f)				0.68
Harsh punishment (f)				0.65
Coefficient alpha	0.77	0.78	0.65	0.72

Table 6-19. Common factor analysis of family meal behaviors in children group

	Factors		
	Perception of family dinner ritual	**Lack of food pressure from parents**	**Parents provide child's favorite foods**
How important is it for you to eat dinner with your family?	0.71		
In my family, dinnertime is more than just a meal; it is a special time.	0.78		
In my family it is important that the family eats at least one meal together every day.	0.64		
I enjoy eating meals with my family.	0.69		
In my family, eating brings people together in an enjoyable way.	0.82		
In my family, a child should eat all of the foods served even if he/she doesn't like them. (reverse coded)		0.65	
I don't have to eat all the things my parents cook.		0.61	
My parents never make me eat things I don't like.		0.61	
My parents buy the kinds of foods I like.			0.69
My parents cook the kinds of food I like.			0.53
My parents let me pick out what kind of breakfast cereals I want.			0.47
Coefficient alpha	0.86	0.71	0.64

Table 6-20. Common factor analysis of self-concept in children group

	Factors		
	Self perception of overweight	**Mother's concern for child overweight**	**Father's concern for child overweight**
Do you think you are (very thin, slightly thin, about average, slightly overweight, very overweight)?	0.70		
Difference between body weight measured and body weight a child thinks that he (she) should weigh.	0.56		
Difference between body weight reported (not measured) by a child and body weight a child think he (she) should weigh.	0.76		
My mother thinks I weight too much.		0.72	
My mother thinks I eat too much.		0.69	
My mother thinks I need to exercise more.		0.61	
My mother thinks we need to go on a diet together.		0.63	
My father thinks I weight too much.			0.71
My father thinks I eat too much.			0.76
My father thinks I need to exercise more.			0.60
My father thinks we need to go on a diet together.			0.56
Coefficient alpha	0.75	0.78	0.77

Table 6-21. Common factor analysis of maternal work-related stresses in children group

	Factors		
	Mother's work stress	**Mother's work commitment**	**Mother's work spillover to family**
I feel "stressed out" by my work.	0.64		
I feel frustrated by my job.	0.64		
I have to work very fast.		0.53	
I have to work very hard.		0.71	
I have more work than time to do it in.		0.82	
I have deadlines that are hard to meet.		0.78	
I experience conflicts between my work responsibilities and my family responsibilities.			0.50
I am able to give my children the attention they need (reverse coded).			0.67
I sometimes miss out on the pleasures of being a parent.			0.64
I worry about the effects my job may have on my children.			0.46
My problems at work spill over into my family.			0.55
Coefficient alpha	0.70	0.81	0.71

Table 6-22. Common factor analysis of paternal work-related stresses in children group

	Factors		
	Father's work stress	**Father's work commitment**	**Father's work spillover to family**
I feel "stressed out" by my work.	0.73		
I feel frustrated by my job.	0.73		
I have to work very fast.		0.64	
I have to work very hard.		0.68	
I have more work than time to do it in.		0.75	
I have deadlines that are hard to meet.		0.74	
I experience conflicts between my work responsibilities and my family responsibilities.			0.44
I am able to give my children the attention they need (reverse coded).			0.52
I sometimes miss out on the pleasures of being a parent.			0.68
I worry about the effects my job may have on my children.			0.73
My problems at work spill over into my family.			0.58
Coefficient alpha	0.79	0.81	0.74

Table 6-23. Common factor analysis of maternal/paternal parenting style dimensions in adolescent group

	Factors			
	Mother's nurturing	**Father's nurturing**	**Mother's control**	**Father's control**
Care (m)	0.78			
Clear behavioral regulation (m)	0.78			
Help (m)	0.65			
Maturity expectations (m)	0.70			
Praise (m)	0.69			
Care (f)		0.86		
Clear behavioral regulation (f)		0.78		
Help (f)		0.72		
Maturity expectations (f)		0.75		
Praise (f)		0.80		
Immaturity expectations (m)			0.63	
Psychological punishment (m)			0.59	
Punishment by withholding privileges (m)			0.74	
Harsh punishment (m)			0.74	
High achievement expectation (m)			0.50	
Immaturity expectations (f)				0.77
Psychological punishment (f)				0.53
Punishment by withholding privileges and Harsh punishment (f)				0.75
High achievement expectation (f)				0.74
Coefficient alpha	0.77	0.84	0.74	0.78

Table 6-24. Common factor analysis of family meal behaviors in adolescent group

	Factors		
	Perception of family dinner ritual	**Lack of food pressure from parents**	**Parents provide child's favorite foods**
How important is it for you to eat dinner with your family?	0.73		
In my family, dinnertime is more than just a meal; it is a special time.	0.78		
In my family it is important that the family eats at least one meal together every day.	0.71		
I enjoy eating meals with my family.	0.71		
In my family, eating brings people together in an enjoyable way.	0.77		
In my family, a child should eat all of the foods served even if he/she doesn't like them. (reverse coded)		0.66	
I don't have to eat all the things my parents cook.		0.61	
My parents never make me eat things I don't like.		0.63	
My parents buy the kinds of foods I like.			0.56
My parents cook the kinds of food I like.			0.57
My parents let me pick out what kind of breakfast cereals I want.			0.42
Coefficient alpha	0.86	0.72	0.59

Table 6-25. Common factor analysis of self-concept in adolescent group

	Factors		
	Self perception of overweight	**Mother's concern for child overweight**	**Father's concern for child overweight**
Do you think you are (very thin, slightly thin, about average, slightly overweight, very overweight)?	0.68		
Difference between body weight measured and body weight a child thinks that he (she) should weigh.	0.82		
Difference between body weight reported (not measured) by a child and body weight a child think he (she) should weigh.	0.90		
My mother thinks I weight too much.		0.71	
My mother thinks I eat too much.		0.43	
My mother thinks I need to exercise more.		0.48	
My mother thinks we need to go on a diet together.		0.62	
My father thinks I weight too much.			0.69
My father thinks I eat too much.			0.56
My father thinks I need to exercise more.			0.42
My father thinks we need to go on a diet together.			0.44
Coefficient alpha	0.85	0.66	0.63

Table 6-26. Common factor analysis of maternal work-related stresses in adolescent group

	Factors		
	Mother's work stress	**Mother's work commitment**	**Mother's work spillover to family**
I feel "stressed out" by my work.	0.80		
I feel frustrated by my job.	0.80		
I have to work very fast.		0.56	
I have to work very hard.		0.60	
I have more work than time to do it in.		0.69	
I have deadlines that are hard to meet.		0.71	
I experience conflicts between my work responsibilities and my family responsibilities.			0.72
I am able to give my children the attention they need (reverse coded).			0.57
I sometimes miss out on the pleasures of being a parent.			0.62
I worry about the effects my job may have on my children.			0.65
My problems at work spill over into my family.			0.54
Coefficient alpha	0.85	0.75	0.76

Table 6-27. Common factor analysis of paternal work-related stresses in adolescent group

	Factors		
	Father's work stress	**Father's work commitment**	**Father's work spillover to family**
I feel "stressed out" by my work.	0.63		
I feel frustrated by my job.	0.63		
I have to work very fast.		0.60	
I have to work very hard.		0.65	
I have more work than time to do it in.		0.61	
I have deadlines that are hard to meet.		0.65	
I experience conflicts between my work responsibilities and my family responsibilities.			0.57
I am able to give my children the attention they need (reverse coded).			0.64
I sometimes miss out on the pleasures of being a parent.			0.64
I worry about the effects my job may have on my children.			0.61
My problems at work spill over into my family.			0.60
Coefficient alpha	0.68	0.73	0.77

Table 6-28. Common factor analysis of maternal/paternal parenting style dimensions in male subject group

	Factors			
	Mother's nurturing	**Father's nurturing**	**Mother's control**	**Father's control**
Care (m)	0.74			
Clear behavioral regulation (m)	0.69			
Help (m)	0.59			
Maturity expectations (m)	0.61			
Praise (m)	0.56			
Care (f)		0.77		
Clear behavioral regulation (f)		0.72		
Help (f)		0.72		
Maturity expectations (f)		0.64		
Praise (f)		0.74		
Immaturity expectations (m)			0.40	
Psychological punishment (m)			0.48	
Punishment by withholding privileges (m)			0.41	
Harsh punishment (m)			0.48	
Immaturity expectations (f)				0.56
Psychological punishment (f)				0.38
Punishment by withholding privileges (f)				0.44
High achievement expectations (f)				0.49
Coefficient alpha	0.79	0.85	0.67	0.74

Table 6-29. Common factor analysis family meal behaviors in male subject group

	Factors		
	Perception of family dinner ritual	**Lack of food pressure from parents**	**Parents provide child's favorite foods**
How important is it for you to eat dinner with your family?	0.66		
In my family, dinnertime is more than just a meal; it is a special time.	0.76		
In my family it is important that the family eats at least one meal together every day.	0.76		
I enjoy eating meals with my family.	0.68		
In my family, eating brings people together in an enjoyable way.	0.63		
In my family, a child should eat all of the foods served even if he/she doesn't like them. (reverse coded)		0.62	
I don't have to eat all the things my parents cook.		0.65	
My parents never make me eat things I don't like.		0.63	
My parents buy the kinds of foods I like.			0.65
My parents cook the kinds of food I like.			0.56
My parents let me pick out what kind of breakfast cereals I want.			0.51
Coefficient alpha	0.83	0.72	0.67

Table 6-30. Common factor analysis of self-concept in male subject group

	Factors		
	Self perception of overweight	**Mother's concern for child overweight**	**Father's concern for child overweight**
Do you think you are (very thin, slightly thin, about average, slightly overweight, very overweight)?	0.71		
Difference between body weight measured and body weight a child thinks that he (she) should weigh.	0.67		
Difference between body weight reported (not measured) by a child and body weight a child think he (she) should weigh.	0.81		
My mother thinks I weight too much.		0.72	
My mother thinks I eat too much.		0.61	
My mother thinks I need to exercise more.		0.50	
My mother thinks we need to go on a diet together.		0.56	
My father thinks I weight too much.			0.67
My father thinks I eat too much.			0.69
My father thinks I need to exercise more.			0.43
My father thinks we need to go on a diet together.			0.45
Coefficient alpha	0.81	0.71	0.67

Table 6-31. Common factor analysis of maternal work-related stresses in male subject group

	Factors		
	Mother's work stress	**Mother's work commitment**	**Mother's work spillover to family**
I feel "stressed out" by my work.	0.68		
I feel frustrated by my job.	0.68		
I have to work very fast.		0.45	
I have to work very hard.		0.61	
I have more work than time to do it in.		0.76	
I have deadlines that are hard to meet.		0.71	
I experience conflicts between my work responsibilities and my family responsibilities.			0.60
I sometimes miss out on the pleasures of being a parent.			0.57
I worry about the effects my job may have on my children.			0.58
My problems at work spill over into my family.			0.55
Coefficient alpha	0.74	0.74	0.69

Table 6-32. Common factor analysis of paternal work-related stresses in male subject group

	Factors		
	Father's work stress	**Father's work commitment**	**Father's work spillover to family**
I feel "stressed out" by my work.	0.70		
I feel frustrated by my job.	0.70		
I have to work very fast.		0.67	
I have to work very hard.		0.65	
I have more work than time to do it in.		0.67	
I have deadlines that are hard to meet.		0.72	
I experience conflicts between my work responsibilities and my family responsibilities.			0.46
I am able to give my children the attention they need (reverse coded).			0.62
I sometimes miss out on the pleasures of being a parent.			0.64
I worry about the effects my job may have on my children.			0.60
My problems at work spill over into my family.			0.56
Coefficient alpha	0.76	0.78	0.73

Table 6-33. Common factor analysis of maternal/paternal parenting style dimensions in female subject group

	Factors			
	Mother's nurturing	**Father's nurturing**	**Mother's control**	**Father's control**
Care (m)	0.68			
Clear behavioral regulation (m)	0.58			
Help (m)	0.54			
Maturity expectations (m)	0.58			
Praise (m)	0.61			
Care (f)		0.78		
Clear behavioral regulation (f)		0.48		
Help (f)		0.61		
Maturity expectations (f)		0.56		
Praise (f)		0.70		
Immaturity expectations (m)			0.63	
Psychological punishment (m)			0.54	
Punishment by withholding privileges (m)			0.38	
Immaturity expectations (f)				0.46
Psychological punishment (f)				0.54
Punishment by withholding privileges (f)				0.61
Harsh punishment (f)				0.56
Coefficient alpha	0.74	0.76	0.70	0.75

Table 6-34. Common factor analysis of family meal behaviors in female subject group

	Factors		
	Perception of family dinner ritual	**Lack of food pressure from parents**	**Parents provide child's favorite foods**
How important is it for you to eat dinner with your family?	0.75		
In my family, dinnertime is more than just a meal; it is a special time.	0.81		
In my family it is important that the family eats at least one meal together every day.	0.70		
I enjoy eating meals with my family.	0.76		
In my family, eating brings people together in an enjoyable way.	0.84		
In my family, a child should eat all of the foods served even if he/she doesn't like them. (reverse coded)		0.68	
I don't have to eat all the things my parents cook.		0.56	
My parents never make me eat things I don't like.		0.62	
My parents buy the kinds of foods I like.			0.59
My parents cook the kinds of food I like.			0.63
My parents let me pick out what kind of breakfast cereals I want.			0.40
Coefficient alpha	0.89	0.70	0.65

Table 6-35. Common factor analysis of self-concept in female subject group

	Factors		
	Self perception of overweight	**Mother's concern for child overweight**	**Father's concern for child overweight**
Do you think you are (very thin, slightly thin, about average, slightly overweight, very overweight)?	0.68		
Difference between body weight measured and body weight a child thinks that he (she) should weigh.	0.67		
Difference between body weight reported (not measured) by a child and body weight a child think he (she) should weigh.	0.81		
My mother thinks I weight too much.		0.72	
My mother thinks I eat too much.		0.55	
My mother thinks I need to exercise more.		0.59	
My mother thinks we need to go on a diet together.		0.69	
My father thinks I weight too much.			0.73
My father thinks I eat too much.			0.64
My father thinks I need to exercise more.			0.61
My father thinks we need to go on a diet together.			0.57
Coefficient alpha	0.79	0.75	0.75

Table 6-36. Common factor analysis of maternal work-related stresses in female subject group

	Factors		
	Mother's work stress	**Mother's work commitment**	**Mother's work spillover to family**
I feel "stressed out" by my work.	0.77		
I feel frustrated by my job.	0.77		
I have to work very fast.		0.60	
I have to work very hard.		0.76	
I have more work than time to do it in.		0.81	
I have deadlines that are hard to meet.		0.81	
I experience conflicts between my work responsibilities and my family responsibilities.			0.57
I am able to give my children the attention they need (reverse coded).			0.78
I sometimes miss out on the pleasures of being a parent.			0.61
I worry about the effects my job may have on my children.			0.63
My problems at work spill over into my family.			0.54
Coefficient alpha	0.83	0.84	0.77

Table 6-37. Common factor analysis of paternal work-related stresses in female subject group

	Factors		
	Father's work stress	**Father's work commitment**	**Father's work spillover to family**
I feel "stressed out" by my work.	0.68		
I feel frustrated by my job.	0.68		
I have to work very fast.		0.54	
I have to work very hard.		0.65	
I have more work than time to do it in.		0.73	
I have deadlines that are hard to meet.		0.70	
I experience conflicts between my work responsibilities and my family responsibilities.			0.56
I am able to give my children the attention they need (reverse coded).			0.55
I sometimes miss out on the pleasures of being a parent.			0.72
I worry about the effects my job may have on my children.			0.76
My problems at work spill over into my family.			0.54
Coefficient alpha	0.73	0.77	0.77

APPENDIX D

DESCRIPTIVE STATISTICS OF STUDY VARIABLES

- TABLES 6-38 TO 6-48

LIST OF TABLES

Table 6-38. List of questions regarding family meal behaviors, self-concept, eating behaviors, physical activity behaviors, and maternal/paternal work-related stress and their corresponding study variables (variables matched with multiple questions indicate factor variables)

Questions	Variables
Family meal behaviors	
How important is it for you to eat dinner with your family? In my family, dinnertime is more than just a meal; it is a special time. In my family it is important that the family eats at least one meal together every day. I enjoy eating meals with my family. In my family, eating brings people together in an enjoyable way.	**Perception of family dinner ritual**
In my family, a child should eat all of the foods served even if he/she doesn't like them. (reverse coded) I don't have to eat all the things my parents cook. My parents never make me eat things I don't like.	**Lack of food pressure from parents**
My parents buy the kinds of foods I like. My parents cook the kinds of food I like. My parents let me pick out what kind of breakfast cereals I want.	**Parents provide child's favorite foods**
How often do you eat breakfast with your family?	**Frequency of family breakfast**
How often do you eat lunch with your family?	**Frequency of family lunch**
How often do you eat dinner with your family?	**Frequency of family dinner**
How often do you go out to dinner with your family?	**Frequency of family dinner away from home**
My mother frequently criticizes the things I eat.	**Mother's criticism about child's eating**
My father frequently criticizes the things I eat.	**Father's criticism about child's eating**
Self-concept	
I feel I'm as good as a person as others are. I feel that I have a number of good qualities. All in all, I feel like that I am a failure. (reverse coded) I am able to do things as well as most other people. I feel I do not have much to be proud of. (reverse coded) I feel positive about myself. On the whole, I am satisfied with myself. I wish I could have more respect for myself. (reverse coded) I feel useless at times. (reverse coded) Sometimes I think I am no good at all. (reverse coded)	**Self-esteem** ****** This variable is not a factor variable although it was created from multiple questions; scores of ten questions were summed and then averaged to calculate scores for self-concept.
Do you think you are (very thin, slightly thin, about average, slightly overweight, very overweight)? Difference between body weight measured and body weight a child thinks that he (she) should weigh. Difference between body weight reported (not measured) by a child and body weight a child think he (she) should weigh.	**Self perception of overweight**
My mother/father thinks I weight too much. My mother/father thinks I eat too much. My mother/father thinks I need to exercise more. My mother/father thinks we need to go on a diet together.	**Mother's/father's concern for child overweight**

Table 6-38. Continued,

Questions	Variables
Self-concept	
Are you more active physically than most people your age, less active than most people your age or about as active as people your age?	**Self perception of activity level**
Would you say that you are (gaining weight, staying at the same weight, or losing weight)?	**Self perception of weight gain**
Eating behaviors	
About how many days a week do you eat breakfast? (reverse coded)	**Frequency of breakfast skipping**
About how many times a day do you have a snack (not counting your meals)?	**Frequency of snacking**
How many times a week do you take vitamins, minerals, or other supplements?	**Frequency of food supplements intake**
When I eat dinner, I usually watch TV at the same time.	**Frequency of TV watching while eating dinner**
Are you now dieting to lose weight?	**Present dieting**
Physical activity behaviors	
Do you exercise for a minimum of 30 minutes at least five times a week?	**Regular exercise**
How many times in the past 14 days have you done at least 30 minutes of exercise hard enough to make you breathe heavily and make your heart beat fast? (Hard exercise include, for example, playing basketball, jogging, or fast bicycling: include time in physical education class)	**Frequency of hard exercise**
How many times in the past 14 days have you done at least 30 minutes of light exercise that was not hard enough to make you breathe heavily and make your heart beat fast? (Light exercise include, for example, playing horse, walking, or slow bicycling: include time in physical education class)	**Frequency of light exercise**
During a normal week how many hours a day do you watch television and videos, or play computer video games, or game boy before or after school?	**Frequency of sedentary activities**
Do you play a team sport?	**Team sport participation**
Maternal/paternal work stress	
I feel “stressed out” by my work. I feel frustrated by my job.	**Mother’s/father’s work stress**
I have to work very fast. I have to work very hard. I have more work than time to do it in. I have deadlines that are hard to meet.	**Mother’s/father’s work commitment**
I experience conflicts between my work responsibilities and my family responsibilities. I am able to give my children the attention they need (reverse coded). I sometimes miss out on the pleasures of being a parent. I worry about the effects my job may have on my children. My problems at work spill over into my family.	**Mother’s/father’s work spillover to family**

Table 6-39. An overview of study variables

Variables	Description	Unit
Parents' socio-economic status, work-related stress, and body mass index		
Mother's age	Age in year	Years old
Father's age	Age in year	Years old
Father's age – mother's age	Age difference calculated by subtracting mother's age from father's age	Years old
Parents' average age	Averaged age for two parents of a household	Years old
Mother's education	Mother's education completed:1 is some grammar school; 2 is completed grammar school; 3 is some high school; 4 is graduated high school; 5 is some college; 6 is college graduate; 7 is some graduate school; 8 is completed graduate school	Rank
Father's education	Same as mother's education	Rank
Father's education – mother's education	Difference in education level calculated by subtracting mother's education level from father's education level	Rank
Parents' average education	Averaged education level for two parents in a household	Rank
Family income	Total household income for the last 12 months before taxes and benefits: 1 is <5,000; 2 is 5,000-9,999; 3 is 10,000-14,999; 4 is 15,000-19,999; 5 is 20,000-29,999; 6 is 30,000-39,999; 7 is 40,000-49,999; 8 is 50,000-69,999; 9 is 70,000-79,999; 10 is 80,000-89,999; 11 is 90,000-99,999; 12 is 100,000-109,999; 13 is 110,000-119,999; 14 is 120,000-129,999; 15 is 130,000-139,999; 16 is 140,000-149,999; 17 is >150,000	Rank
Mother's work stress	The greater the factor score, the more stresses a mother perceived due to her work	Factor
Mother's work commitment	The greater the factor score, the more strongly a mother committed to work	Factor
Mother's work spillover to family	The greater the factor score, the more likely a mother finds less time for her family due to her work spillover	Factor
Father's work stress	Same as mother's work stress	Factor
Father's work commitment	Same as mother's work commitment	Factor
Father's work spillover to family	Same as mother's work spillover to family	Factor
Mother's BMI	Mother's body mass index calculated by body weight in kg divided by height in meter squared	Kg/m^2
Father's BMI	Same as mother's BMI	Kg/m^2
Parents' average BMI	Averaged parents' BMI	Kg/m^2
Parenting styles and dimensions		
Mother's authoritative style	1 if mother's child-perceived parenting style is authoritative; 0 otherwise	0 or 1
Father's authoritative style	1 if father's child-perceived parenting style is authoritative; 0 otherwise	0 or 1
Both parents' authoritative style	1 if both parents' child-perceived parenting styles are authoritative; 0 otherwise	0 or 1
Mother's nurturing	The greater the factor score, the greater nurturing a mother used	Factor
Father's nurturing	The greater the factor score, the greater nurturing a father used	Factor
Mother's control	The greater the factor score, the greater control a mother used	Factor
Father's control	The greater the factor score, the greater control a father used	Factor
Family meal behaviors		
Frequency of family breakfast	1 is less than or equal to a couple of times a month; 2 is about once a week; 3 is a couple of days a week; 4 is every day	Rank
Frequency of family lunch	Same as family breakfast	Rank
Frequency of family dinner	Same as family breakfast	Rank
Frequency of family dinner away from home	1 is less than or equal to several times a year; 2 is about once a month; 3 is a couple of times a month; 4 is about once a week; 5 is greater than or equal to a couple of days a week	Rank

Table 6-39. Continued,

Variables	Description	Unit
Family meal behaviors		
Perception of family dinner ritual	The greater the factor score, the more strongly a child perceive family dinner to be a ritual	Factor
Lack of food pressure from parents	The greater the factor score, the less likely parents exerted pressure over children's completion of foods served	Factor
Parents provide child's favorite foods	The greater the factor score, the more likely parents provided foods that the child likes	Factor
Mother's criticism about child's eating	1 is never; 2 is once in a while; 3 is frequently; 4 is very frequently	Rank
Father's criticism about child's eating	Same as mother's criticism about child's eating	Rank
Self-concept		
Self-esteem	The higher the score, a child possesses higher self-esteem toward himself (herself): 1 is strongly disagree; 2 is disagree; 3 is agree; 4 is strongly agree	Score
Self perception of overweight	The higher the factor score, the more likely a child perceive himself (herself) to be overweight	Factor
Mother's concern for child overweight	The higher the factor score, the more likely a child perceive his (her) mother expresses her concern about child overweight	Factor
Father's concern for child overweight	The higher the factor score, the more likely a child perceive his (her) father expresses his concern about child overweight	Factor
Self perception of activity level	1 if a child is more active; 0 otherwise (about the same or less active)	0 or 1
Self perception of weight gain	1 is losing weight; 2 is staying at the same weight; 3 is gaining weight	Rank
Eating behaviors		
Frequency of skipping breakfast	1is skipping 2 days or less; 2 is skipping 3-4 days; 3 is skipping 5 days or more	Rank
Frequency of snacking	1 is 0 or 1 times; 2 is 2-3 times; 3 is 4 times or more	Rank
Frequency of food supplements intake	1 is never; 2 is 1-4 times/wk; 3 is 5-7 times/wk	Rank
Frequency of TV watching while eating dinner	1 is never; 2 is sometimes; 3 is always	Rank
Present dieting	1 if a child is now dieting to lose weight; 0 otherwise	0 or 1
Physical activity behaviors		
Regular exercise	1 if a child exercise for a minimum of 30 minutes at least five times a week; 0 otherwise	0 or 1
Frequency of hard exercise	1 is none; 2 is 1-2 days; 3 is 3-5 days; 4 is 6-8 days; 5 is 9 or more days	Rank
Frequency of light exercise	1 is none; 2 is 1-2 days; 3 is 3-5 days; 4 is 6-8 days; 5 is 9 or more days	Rank
Frequency of sedentary activities	1 is 1 hour or less; 2 is 2-3 hours; 3 is 4-5 hours; 4 is 6 or more hours	Rank
Team sport participation	1 if a child plays a team sport; 0 otherwise	0 or 1
Energy and nutrients intake		
Total calorie	Total amount of calories consumed in Kcal, this variable is calculated by averaging three days of dietary data	Kcal
Calorie per body weight	Amount of calories consumed in Kcal unit per kg body weight	Kcal
Percent calorie from carbohydrates	Percentage of calories attributable to total carbohydrates	Percent
Percent calorie from protein	Percentage of calories attributable to protein	Percent

Table 6-39. Continued,

Variables	Description	Unit
Energy and nutrients intake		
Percent calorie from total fat	Percentage of calories attributable to total fat	Percent
Percent calorie from saturated fat	Percentage of calories attributable to saturated fat	Percent
Percent DRI for calcium	Amount of calcium consumed in terms of percentage of DRI for calcium	Percent
Percent DRI for iron	Amount of iron consumed in terms of percentage of DRI for iron	Percent
Percent DRI for vitamin A	Amount of vitamin A consumed in terms of percentage of DRI for vitamin A	Percent
Percent DRI for vitamin C	Amount of vitamin C consumed in terms of percentage of DRI for vitamin C	Percent
Percent DRI for folate	Amount of folate consumed in terms of percentage of DRI for folate	Percent
Percent DRI for dietary fiber	Amount of dietary fiber consumed in terms of percentage of DRI for dietary fiber	Percent
Total sugar	Amount of total sugar consumed	Gram
Sodium	Amount of sodium consumed	Milligram
Total cholesterol	Amount of total cholesterol consumed	Milligram
Saturated fats	Amount of saturated fatty acids consumed	Gram
Trans fats	Amount of trans fatty acids consumed	Gram
Body measurements and BMI		
Height	Body height measured nearest to 1/8 inch and it was converted to cm unit	Centimeter
Weight	Body weight measure in lbs and then it was converted to kg unit	Kilogram
Triceps skinfold	Average of three triceps skinfold thickness measurements	Millimeter
Sub-scapular skinfold	Average of three subscapular skinfold thickness measurements	Millimeter
Waist circumference	Waist circumference measured	Centimeter
BMI	Body weight in kg/ (height in meter)^2	Score
BMI-z score	Standard deviation scores of BMI-for-age using 2000 CDC Growth Charts	Score
Normal weight	Having BMI in the 5th ~ 85th percentile based on the 2000 CDC Growth Charts : 1 if a child's weight is normal; 0 otherwise	0 or 1
At risk of overweight	Having BMI in the 85th ~ 95th percentile based on the 2000 CDC Growth Charts ; 1 if a child's weight is at risk of overweight; 0 otherwise	0 or 1
Above normal weight	Having BMI in the > 85th percentile based on the 2000 CDC Growth Charts ; 1 if a child's weight is above normal weight; 0 otherwise	0 or 1
Overweight	Having BMI in the > 95th percentile based on the 2000 CDC Growth Charts : 1 if a child's weight is overweight; 0 otherwise	0 or 1
Others		
Child's age	Age in years	Years old
Child's gender	1 if a child is girl; 0 otherwise	0 or 1
White race	1 if a child is Anglo/Caucasion/White/Irish; 0 otherwise	0 or 1
Child's activity level	1 if a child is physically active; 0 otherwise	0 or 1
Child's maturity level	1 if a child is at pubescent; 0 for prepubescent	0 or 1

Table 6-40. Summary statistics for children 9 to 11 years old

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Mother's age	126	41.13	4.46	31.00	52.00
Father's age	120	43.53	5.53	32.00	69.00
Father's age – mother's age	120	2.38	4.51	-6.00	33.00
Parents' average age	126	42.27	4.52	32.00	52.50
Mother's education	126	5.85	1.22	3.00	8.00
Father's education	120	6.01	1.30	3.00	8.00
Father's education – mother's education	120	0.12	1.50	-3.00	4.00
Parents' average education	126	5.90	1.02	3.00	8.00
Family income	116	11.47	3.69	5.00	17.00
Mother's work stress	87	0.00	0.73	-1.25	1.78
Mother's work commitment	86	0.00	0.90	-1.88	1.76
Mother's work spillover to family	87	0.00	0.84	-1.29	2.27
Father's work stress	118	0.00	0.81	-1.28	2.09
Father's work commitment	116	0.00	0.88	-2.10	1.86
Father's work spillover to family	117	0.00	0.86	-1.52	2.43
Mother's BMI	125	25.33	5.39	17.59	46.06
Father's BMI	120	27.80	4.18	20.08	45.78
Parents' average BMI	119	26.39	3.57	20.09	38.57
Mother's authoritative style	127	0.51	0.50	0.00	1.00
Father's authoritative style	127	0.62	0.49	0.00	1.00
Both parents' authoritative style	127	0.44	0.50	0.00	1.00
Mother's nurturing	126	0.00	1.00	-3.38	1.54
Father's nurturing	125	0.00	1.00	-3.12	1.68
Mother's control	126	0.00	1.00	-1.87	2.73
Father's control	126	0.00	1.00	-1.74	3.01
Frequency of family breakfast	127	2.46	1.06	1.00	4.00
Frequency of family lunch	127	2.39	1.02	1.00	4.00
Frequency of family dinner	127	3.39	0.97	1.00	4.00
Frequency of family dinner away from home	127	3.21	1.17	1.00	5.00
Perception of family dinner ritual	126	0.00	0.92	-2.40	1.39
Lack of food pressure from parents	127	0.00	0.79	-1.73	1.51
Parents provide child's favorite foods	127	0.00	0.76	-2.39	1.46
Mother's criticism about child's eating	127	1.66	0.72	1.00	4.00
Father's criticism about child's eating	126	1.52	0.63	1.00	3.00
Self esteem	127	32.83	4.42	20.00	40.00
Self perception of overweight	119	1.71	0.24	1.00	2.51
Mother's concern for child overweight	127	0.00	0.86	-0.93	3.25
Father's concern for child overweight	125	0.00	0.86	-0.87	2.89
Self perception of activity level	127	0.25	0.44	0.00	1.00
Self perception of weight gain	127	2.10	0.58	1.00	3.00
Frequency of skipping breakfast	127	1.34	0.61	1.00	3.00
Frequency of snacking	127	1.77	0.70	1.00	3.00
Frequency of food supplements intake	126	1.84	0.83	1.00	3.00
Frequency of TV watching while eating dinner	127	1.85	0.66	1.00	3.00
Present dieting	127	0.12	0.32	0.00	1.00

Table 6-40. Continued,

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Regular exercise	127	0.62	0.49	0.00	1.00
Frequency of hard exercise	127	3.18	1.20	1.00	5.00
Frequency of light exercise	127	3.09	1.33	1.00	5.00
Frequency of sedentary activities	127	2.13	0.93	1.00	4.00
Team sport participation	126	0.67	0.47	0.00	1.00
Total calorie	127	2040.73	505.69	969.01	4629.00
Calorie per body weight	127	53.21	16.19	23.20	95.34
Percent calorie from carbohydrates	127	0.55	0.06	0.39	0.71
Percent calorie from protein	127	0.14	0.03	0.07	0.22
Percent calorie from total fat	127	0.33	0.05	0.18	0.45
Percent calorie from saturated fat	127	0.12	0.03	0.05	0.20
Percent DRI for calcium	127	0.66	0.24	0.21	1.35
Percent DRI for iron	127	1.69	0.73	0.64	6.19
Percent DRI for vitamin A	127	0.51	0.34	0.01	1.73
Percent DRI for vitamin C	127	1.67	1.16	0.21	5.01
Percent DRI for folate	127	0.93	0.61	0.10	3.20
Percent DRI for dietary fiber	127	0.46	0.19	0.17	1.65
Total sugar	127	134.19	42.59	47.38	278.08
Sodium	127	3193.50	1204.85	1201.85	9851.01
Total cholesterol	127	211.06	101.98	19.49	577.28
Saturated fats	127	27.48	9.90	7.80	57.86
Trans fats	127	1.57	1.32	0.01	5.80
Height	127	143.27	8.80	120.65	172.09
Weight	127	40.31	10.69	22.91	76.20
Triceps skinfold	127	16.03	6.16	6.00	36.33
Sub-scapular skinfold	127	11.02	7.18	4.00	33.00
Waist circumference	127	65.60	11.37	24.50	98.00
BMI	127	19.50	4.24	13.92	35.30
BMI-z score	127	0.62	1.07	-1.50	2.62
Normal weight	127	0.61	0.49	0.00	1.00
At risk of overweight	127	0.20	0.41	0.00	1.00
Above normal weight	127	0.39	0.49	0.00	1.00
Overweight	127	0.19	0.39	0.00	1.00
Child's age	127	10.06	0.80	9.00	11.00
Child’s gender	127	0.49	0.50	0.00	1.00
White race	127	0.76	0.43	0.00	1.00
Child’s activity level	127	0.62	0.49	0.00	1.00
Child’s maturity level	121	0.24	0.43	0.00	1.00

Table 6-41. Summary statistics for adolescents 13 to 15 years old

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Mother's age	105	44.00	4.53	34.00	53.00
Father's age	102	46.36	4.88	38.00	65.00
Father's age – mother's age	101	2.41	4.34	-8.00	18.00
Parents' average age	106	45.09	4.22	36.00	56.00
Mother's education	105	5.93	1.25	4.00	8.00
Father's education	102	6.00	1.33	3.00	8.00
Father's education – mother's education	101	0.03	1.47	-3.00	3.00
Parents' average education	106	5.93	1.09	4.00	8.00
Family income	97	11.55	3.70	5.00	17.00
Mother's work stress	84	0.00	0.86	-1.49	2.28
Mother's work commitment	83	0.00	0.85	-1.92	2.08
Mother's work spillover to family	84	0.00	0.87	-1.41	2.21
Father's work stress	98	0.00	0.72	-1.39	1.63
Father's work commitment	98	0.00	0.84	-2.41	1.93
Father's work spillover to family	98	0.00	0.85	-1.61	2.40
Mother's BMI	105	25.81	5.59	17.97	46.20
Father's BMI	102	27.51	4.02	17.63	39.13
Parents' average BMI	101	26.66	3.85	19.79	41.00
Mother's authoritative style	106	0.69	0.47	0.00	1.00
Father's authoritative style	106	0.86	0.35	0.00	1.00
Both parents' authoritative style	106	0.61	0.49	0.00	1.00
Mother's nurturing	105	0.00	1.00	-2.30	1.70
Father's nurturing	106	0.00	1.00	-3.61	1.53
Mother's control	105	0.00	1.00	-2.08	2.57
Father's control	106	0.00	1.00	-3.10	2.87
Frequency of family breakfast	106	2.08	0.80	1.00	3.00
Frequency of family lunch	106	2.13	0.77	1.00	3.00
Frequency of family dinner	106	2.48	0.71	1.00	3.00
Frequency of family dinner away from home	106	3.23	1.14	1.00	5.00
Perception of family dinner ritual	105	0.00	0.92	-2.96	1.82
Lack of food pressure from parents	106	0.00	0.79	-2.09	1.53
Parents provide child's favorite foods	106	0.00	0.70	-2.20	1.47
Mother's criticism about child's eating	106	1.71	0.69	1.00	4.00
Father's criticism about child's eating	106	1.55	0.71	1.00	4.00
Self esteem	106	33.71	4.01	16.00	40.00
Self perception of overweight	102	0.94	0.28	0.00	2.22
Mother's concern for child overweight	106	0.00	0.81	-0.84	2.72
Father's concern for child overweight	106	0.00	0.78	-0.80	2.59
Self perception of activity level	106	0.35	0.48	0.00	1.00
Self perception of weight gain	106	2.09	0.56	1.00	3.00
Frequency of skipping breakfast	100	1.61	0.78	1.00	3.00
Frequency of snacking	106	1.86	0.61	1.00	3.00
Frequency of food supplements intake	106	1.75	0.83	1.00	3.00
Frequency of TV watching while eating dinner	106	1.89	0.75	1.00	3.00
Present dieting	106	0.09	0.29	0.00	1.00

Table 6-41. Continued,

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Regular exercise	106	0.74	0.44	0.00	1.00
Frequency of hard exercise	106	3.63	1.24	1.00	5.00
Frequency of light exercise	106	3.47	1.24	1.00	5.00
Frequency of sedentary activities	105	2.21	1.01	1.00	4.00
Team sport participation	106	0.65	0.48	0.00	1.00
Total calorie	106	2077.78	675.45	763.46	4408.25
Calorie per body weight	106	35.65	14.21	11.65	94.35
Percent calorie from carbohydrates	106	0.55	0.07	0.36	0.74
Percent calorie from protein	106	0.15	0.04	0.09	0.25
Percent calorie from total fat	106	0.32	0.05	0.18	0.46
Percent calorie from saturated fat	106	0.11	0.03	0.05	0.18
Percent DRI for calcium	106	0.66	0.43	0.10	3.10
Percent DRI for iron	106	1.29	0.95	0.25	6.31
Percent DRI for vitamin A	106	0.45	0.50	0.01	3.48
Percent DRI for vitamin C	106	1.12	0.90	0.11	5.46
Percent DRI for folate	106	0.72	0.77	0.11	7.03
Percent DRI for dietary fiber	106	0.43	0.18	0.07	1.02
Total sugar	106	136.68	63.18	24.45	334.52
Sodium	106	3147.06	1100.72	869.25	6754.89
Total cholesterol	106	237.69	133.74	23.55	758.32
Saturated fats	106	26.90	11.96	6.10	69.40
Trans fats	106	1.62	1.69	0.00	9.49
Height	106	165.32	9.55	116.52	185.74
Weight	106	61.05	14.21	36.74	135.63
Triceps skinfold	106	15.15	7.15	4.00	41.67
Sub-scapular skinfold	105	11.83	6.31	4.33	33.67
Waist circumference	106	72.74	11.81	26.00	121.30
BMI	106	22.36	5.12	14.80	45.97
BMI-z score	106	0.58	0.95	-2.56	2.87
Normal weight	106	0.64	0.48	0.00	1.00
At risk of overweight	106	0.20	0.40	0.00	1.00
Above normal weight	106	0.35	0.48	0.00	1.00
Overweight	106	0.15	0.36	0.00	1.00
Child's age	106	14.13	0.79	13.00	15.00
Child’s gender	106	0.48	0.50	0.00	1.00
White race	106	0.78	0.41	0.00	1.00
Child’s activity level	106	0.74	0.44	0.00	1.00
Child’s maturity level	105	0.98	0.14	0.00	1.00

Table 6-42. Summary statistics for male subjects

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Mother’s age	121	42.78	5.09	31.00	61.00
Father’s age	117	45.13	5.52	33.00	69.00
Father’s age – mother’s age	116	2.32	4.54	-8.00	33.00
Parents’ average age	122	43.84	4.81	32.00	58.00
Mother’s education	121	5.81	1.23	3.00	8.00
Father’s education	117	5.95	1.32	3.00	8.00
Father’s education – mother’s education	116	0.12	1.48	-3.00	4.00
Parents’ average education	122	5.85	1.05	4.00	8.00
Family income	117	11.04	3.67	5.00	17.00
Mother’s work stress	86	0.00	0.77	-1.25	1.79
Mother’s work commitment	84	0.00	0.86	-1.96	2.01
Mother’s work spillover to family	86	0.00	0.80	-1.22	2.66
Father’s work stress	114	0.00	0.78	-1.28	2.09
Father’s work commitment	113	0.00	0.87	-2.20	2.00
Father’s work spillover to family	113	0.00	0.84	-1.53	2.48
Mother’s BMI	121	25.83	5.70	17.85	46.20
Father’s BMI	117	27.62	3.89	20.08	38.95
Parents’ average BMI	116	26.65	3.55	20.09	36.58
Mother’s authoritative style	123	0.59	0.49	0.00	1.00
Father’s authoritative style	123	0.60	0.49	0.00	1.00
Both parents’ authoritative style	122	0.45	0.50	0.00	1.00
Mother’s nurturing	122	0.00	0.87	-2.80	1.40
Father’s nurturing	122	0.00	0.91	-2.77	1.48
Mother’s control	121	0.00	0.69	-1.27	1.69
Father’s control	122	0.00	0.72	-1.86	1.96
Frequency of family breakfast	123	4.96	1.68	1.00	7.00
Frequency of family lunch	123	4.75	1.64	1.00	7.00
Frequency of family dinner	123	6.37	1.22	1.00	7.00
Frequency of family dinner away from home	123	4.28	1.15	1.00	7.00
Perception of family dinner ritual	122	0.00	0.91	-3.01	1.65
Lack of food pressure from parents	123	0.00	0.79	-1.78	1.59
Parents provide child’s favorite foods	123	0.00	0.67	-2.22	1.27
Mother’s criticism about child’s eating	123	1.65	0.75	1.00	4.00
Father’s criticism about child’s eating	122	1.59	0.71	1.00	4.00
Self esteem	123	33.22	4.35	16.00	40.00
Self perception of overweight	121	1.80	0.24	1.00	2.38
Mother’s concern for child overweight	123	0.00	0.82	-0.92	2.49
Father’s concern for child overweight	122	0.00	0.81	-0.88	2.75
Self perception of activity level	123	0.33	0.47	0.00	1.00
Self perception of weight gain	123	2.17	0.58	1.00	3.00
Frequency of skipping breakfast	123	1.40	0.66	1.00	3.00
Frequency of snacking	123	2.09	1.00	1.00	4.00
Frequency of food supplements intake	123	1.84	0.86	1.00	3.00
Frequency of TV watching while eating dinner	123	1.88	0.75	1.00	3.00
Present dieting	123	0.07	0.26	0.00	1.00

Table 6-42. Continued,

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Regular exercise	123	0.65	0.48	0.00	1.00
Frequency of hard exercise	123	2.02	0.72	1.00	3.00
Frequency of light exercise	123	1.96	0.73	1.00	3.00
Frequency of sedentary activities	123	2.33	1.01	1.00	4.00
Team sport participation	122	0.68	0.47	0.00	1.00
Total calorie	123	2209.18	625.76	763.46	4629.00
Calorie per body weight	123	47.20	18.45	11.65	95.34
Percent calorie from carbohydrates	123	0.54	0.06	0.36	0.71
Percent calorie from protein	123	0.14	0.03	0.09	0.25
Percent calorie from total fat	123	0.33	0.05	0.21	0.46
Percent calorie from saturated fat	123	0.12	0.02	0.06	0.18
Percent DRI for calcium	123	0.73	0.39	0.10	3.10
Percent DRI for iron	123	1.72	0.97	0.25	6.31
Percent DRI for vitamin A	123	0.46	0.34	0.01	2.11
Percent DRI for vitamin C	123	1.42	1.09	0.15	5.46
Percent DRI for folate	123	0.94	0.86	0.10	7.03
Percent DRI for dietary fiber	123	0.41	0.16	0.07	1.02
Total sugar	123	145.02	57.66	35.29	334.52
Sodium	123	3302.45	1146.71	899.29	9851.01
Total cholesterol	123	251.64	127.86	50.45	758.32
Saturated fats	123	29.57	11.06	7.87	69.40
Trans fats	123	1.74	1.63	0.00	9.49
Height	123	154.82	15.67	116.52	185.74
Weight	123	50.85	15.57	26.54	99.34
Triceps skinfold	123	14.10	6.67	4.00	41.67
Sub-scapular skinfold	122	10.72	6.34	4.00	33.67
Waist circumference	123	69.54	12.45	24.50	100.50
BMI	123	20.93	4.83	14.53	45.10
BMI-z score	123	0.67	1.04	-2.56	2.87
Normal weight	123	0.58	0.50	0.00	1.00
At risk of overweight	123	0.21	0.41	0.00	1.00
Above normal weight	123	0.41	0.49	0.00	1.00
Overweight	123	0.20	0.40	0.00	1.00
Child's age	123	11.96	2.15	9.00	15.00
Child’s gender	123	0.00	0.00	0.00	0.00
White race	123	0.76	0.43	0.00	1.00
Child’s activity level	123	0.65	0.48	0.00	1.00
Child’s maturity level	120	0.57	0.50	0.00	1.00

Table 6-43. Summary statistics for female subjects

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Mother's age	117	42.14	4.72	30.00	52.00
Father's age	112	44.47	5.75	29.00	65.00
Father's age – mother's age	112	2.37	4.38	-6.00	18.00
Parents' average age	117	43.27	4.83	29.50	56.00
Mother's education	117	5.97	1.22	3.00	8.00
Father's education	112	6.10	1.31	3.00	8.00
Father's education – mother's education	112	0.07	1.47	-3.00	3.00
Parents' average education	117	6.00	1.05	3.00	8.00
Family income	102	12.07	3.66	5.00	17.00
Mother's work stress	91	0.00	0.84	-1.42	2.33
Mother's work commitment	91	0.00	0.91	-2.00	1.78
Mother's work spillover to family	91	0.00	0.88	-1.32	2.42
Father's work stress	109	0.00	0.76	-1.43	2.09
Father's work commitment	108	0.00	0.86	-1.59	2.02
Father's work spillover to family	109	0.00	0.88	-1.61	2.40
Mother's BMI	116	25.33	5.29	17.59	45.73
Father's BMI	112	27.58	4.35	17.63	45.78
Parents' average BMI	111	26.35	3.80	19.79	41.00
Mother's authoritative style	117	0.79	0.41	0.00	1.00
Father's authoritative style	117	0.70	0.46	0.00	1.00
Both parents' authoritative style	117	0.61	0.49	0.00	1.00
Mother's nurturing	116	0.00	0.85	-2.38	1.25
Father's nurturing	116	0.00	0.88	-3.51	1.40
Mother's control	117	0.00	0.73	-1.51	2.13
Father's control	116	0.00	0.78	-1.48	2.46
Frequency of family breakfast	117	4.70	1.88	1.00	7.00
Frequency of family lunch	117	4.90	1.72	1.00	7.00
Frequency of family dinner	117	6.22	1.32	1.00	7.00
Frequency of family dinner away from home	117	4.16	1.27	1.00	7.00
Perception of family dinner ritual	116	0.00	0.94	-2.40	1.48
Lack of food pressure from parents	117	0.00	0.79	-1.97	1.43
Parents provide child's favorite foods	117	0.00	0.73	-2.12	1.46
Mother's criticism about child's eating	117	1.73	0.64	1.00	4.00
Father's criticism about child's eating	117	1.48	0.60	1.00	4.00
Self esteem	117	33.32	4.07	20.00	40.00
Self perception of overweight	107	-0.64	0.09	-1.00	-0.35
Mother's concern for child overweight	117	0.00	0.85	-0.87	3.21
Father's concern for child overweight	116	0.00	0.84	-0.83	2.65
Self perception of activity level	117	0.27	0.45	0.00	1.00
Self perception of weight gain	117	2.03	0.53	1.00	3.00
Frequency of skipping breakfast	117	1.50	0.65	1.00	3.00
Frequency of snacking	117	2.00	0.99	1.00	4.00
Frequency of food supplements intake	116	1.77	0.78	1.00	3.00
Frequency of TV watching while eating dinner	117	1.85	0.63	1.00	3.00
Present dieting	117	0.15	0.35	0.00	1.00

Table 6-43. Continued,

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Regular exercise	117	0.70	0.46	0.00	1.00
Frequency of hard exercise	117	1.98	0.73	1.00	3.00
Frequency of light exercise	117	1.93	0.75	1.00	3.00
Frequency of sedentary activities	114	2.07	0.93	1.00	4.00
Team sport participation	117	0.64	0.48	0.00	1.00
Total calorie	117	1897.30	492.69	863.95	3329.01
Calorie per body weight	117	43.25	16.62	13.68	83.52
Percent calorie from carbohydrates	117	0.56	0.07	0.41	0.74
Percent calorie from protein	117	0.14	0.03	0.07	0.25
Percent calorie from total fat	117	0.32	0.05	0.18	0.43
Percent calorie from saturated fat	117	0.12	0.03	0.05	0.20
Percent DRI for calcium	117	0.59	0.25	0.16	1.35
Percent DRI for iron	117	1.29	0.63	0.30	3.34
Percent DRI for vitamin A	117	0.50	0.48	0.01	3.48
Percent DRI for vitamin C	117	1.41	1.06	0.11	4.99
Percent DRI for folate	117	0.72	0.42	0.12	1.77
Percent DRI for dietary fiber	117	0.49	0.19	0.18	1.65
Total sugar	117	124.10	44.64	24.45	278.08
Sodium	117	3034.15	1139.86	869.25	9395.96
Total cholesterol	117	191.16	95.78	19.49	624.26
Saturated fats	117	24.75	9.93	6.10	56.51
Trans fats	117	1.40	1.29	0.00	6.75
Height	117	151.63	12.20	120.65	177.80
Weight	117	48.39	16.49	22.91	135.63
Triceps skinfold	117	17.23	6.12	6.00	36.33
Sub-scapular skinfold	117	11.97	7.11	4.00	33.00
Waist circumference	117	68.05	11.42	31.00	121.30
BMI	117	20.60	4.85	13.92	45.97
BMI-z score	117	0.51	0.98	-1.50	2.67
Normal weight	117	0.67	0.47	0.00	1.00
At risk of overweight	117	0.20	0.40	0.00	1.00
Above normal weight	117	0.33	0.47	0.00	1.00
Overweight	117	0.14	0.35	0.00	1.00
Child's age	117	11.91	2.19	9.00	16.00
Child’s gender	117	1.00	0.00	1.00	1.00
White race	117	0.79	0.41	0.00	1.00
Child’s activity level	117	0.70	0.46	0.00	1.00
Child’s maturity level	113	0.61	0.49	0.00	1.00

Table 6-44. Comparison of dietary intake data across studies for children

Energy and Nutrients	CSFII [a]		Present study [b]	
	Male (n=1031)	**Female** (n=969)	**Male** (n=65)	**Female** (n=62)
Energy (Kcal)	2050	1825	2084	1994
Carbohydrate (g)	279.6	250	282.5	279.5
Protein (g)	71.2	62.7	73.6	64.1
Fat (g)	75.1	66.8	76.6	72.3
Carbohydrate (% cal)	54.8	54.9	54.3	56.3
Protein (% cal)	14	13.9	14.3	12.9
Fat(% cal)	32.6	32.6	32.8	32.2
Vitamin A (IU)	5242	4475	3968.3	4267.4
Vitamin C (IU)	103	95	73.3	76.7
Calcium (mg)	984	865	894.3	821.9
Iron (mg)	16.6	13.8	14.6	12.4

a: 6-11 years old male and females' dietary intake data obtained from the Continuing Survey of Food Intakes by Individuals (CSFII) 1994-1996, b: 9-11 years old male and female' energy and nutrient intake data obtained from Houston, US, 2002-2003.

Table 6-45. Comparison of dietary intake data across studies for adolescents

Energy and Nutrients	CSFII [a]		Present study [b]	
	Male (n=737)	**Female** (n=732)	**Male** (n=55)	**Female** (n=51)
Energy (Kcal)	2766.0	1910.0	2363.2	1770.0
Carbohydrate (g)	366.1	261.9	323.9	241.9
Protein (g)	97.5	65.3	85.1	64.1
Fat (g)	102.8	69.3	84.6	63.2
Carbohydrate (% cal)	53.2	55.0	54.6	55.2
Protein (% cal)	14.4	14.0	14.7	14.7
Fat(% cal)	33.1	32.2	32.1	31.5
Vitamin A (IU)	6361.0	4817.0	4150.4	5104.1
Vitamin C (IU)	119.0	95.0	78.4	59.7
Calcium (mg)	1145.0	771.0	1008.9	700.7
Iron (mg)	19.8	13.8	16.3	11.4

a: 12-19 years old male and females' dietary intake data obtained from the Continuing Survey of Food Intakes by Individuals (CSFII) 1994-1996, b: 13-15 years old male and female' energy and nutrient intake data obtained from Houston, US, 2002-2003.

Table 6-46. Percentage of study subjects who fell to each body weight category based on the 2000 CDC Growth Charts

Age	Size (n)	Normal	At risk for overweight	Overweight	Above normal
MALE					
9	16	50.00 %	18.75 %	31.25 %	50.00 %
10	27	62.96 %	11.11 %	25.93 %	37.04 %
11	22	54.55 %	27.27 %	18.18 %	45.45 %
13	13	53.85 %	15.38 %	30.77 %	46.15 %
14	20	60.00 %	30.00 %	5.00 %	35.00 %
15	22	63.64 %	22.73 %	13.64 %	36.36 %
FEMALE					
Age	**Size (n)**	**Normal**	**At risk for overweight**	**Overweight**	**Above normal**
9	21	66.67 %	14.29 %	19.05 %	33.33 %
10	18	66.67 %	27.78 %	5.56 %	33.33 %
11	23	60.87 %	26.09 %	13.04 %	39.13 %
13	14	71.43 %	14.29 %	14.29 %	28.57 %
14	18	77.78 %	16.67 %	5.56 %	22.22 %
15	19	57.89 %	15.79 %	26.32 %	42.11 %

The four categories of body weight are defined with specific BMI percentile cutoffs in the CDC 2000 Growth Chart. 5th percentile <= Normal < 85th percentiles, 85th <= At risk for overweight < 95th, Overweight >= 95th, Above normal >= 85th.

Table 6-47. The 85th, 90th, and 95th cutoffs of BMI percentiles at NHANES 1999-2002 anthropometric data and percentage of study subjects who fell to at or above the corresponding BMI percentiles

Sex/ Age	Size (n)	85th percentile		90th percentile		95th percentile	
		Cutoff	Subjects	Cutoff	Subjects	Cutoff	Subjects
MALE							
9	16	22.1	12.5%	23.9	12.5%	N/A	N/A
10	27	22.6	25.9%	24.4	25.9%	N/A	N/A
11	22	24.3	18.2%	24.7	18.2%	N/A	N/A
13	13	25.4	30.8%	27.8	15.4%	30.3	0%
14	20	27.4	5%	30.7	0%	N/A	N/A
15	22	28.1	9.1%	30.6	9.1%	32.5	4.6%
FEMALE							
9	21	22.7	19.1%	23.7	4.8%	N/A	N/A
10	18	23.3	5.6%	24.9	5.6%	N/A	N/A
11	23	26.2	4.4%	28.1	4.4%	N/A	N/A
13	14	28.3	14.3%	29.9	7.1%	32.4	0%
14	18	28.3	5.6%	29.7	5.6%	33.4	0%
15	19	28.7	21.1%	32.5	10.5%	N/A	N/A

Left-hand column of each percentile range indicates corresponding BMI cutoff in the NHANES 1999-2002 data and the right-hand columns designate percentage of study subjects that fall into the 'at or above' the BMI percentiles.

Table 6-48. Comparison of selected anthropometric data for children and adolescents by sex and age across studies

Sex/Age	BMI (Kg/m^2)		Height (cm)		Weight (Kg)		Waist (cm)		Triceps SF(mm)		Subscap SF (mm)	
	N[a]	H[b]	N	H	N	H	N	H	N	H	N	H
MALE												
9	18.7	19.1	138.1	135.6	36.0	35.0	66.4	64.9	13.4	14.0	8.5	9.5
	(174)	(16)	(177)	(16)	(174)	(16)	(175)	(16)	(173)	(16)	(167)	(16)
10	19.1	20	141.4	145.1	38.6	42.4	67.7	66.8	14.0	15.7	10.3	11.9
	(187)	(27)	(188)	(27)	(187)	(27)	(185)	(27)	(184)	(27)	(180)	(27)
11	19.6	20.6	148.7	147.6	43.7	44.8	70.3	68.1	13.8	15.7	10.3	11.5
	(182)	(22)	(187)	(22)	(182)	(22)	(181)	(22)	(182)	(22)	(178)	(22)
13	20.7	22.1	160.1	163.2	53.9	59.0	73.8	76.6	13.4	16.6	10.4	12.2
	(298)	(13)	(298)	(13)	(298)	(13)	(294)	(13)	(289)	(13)	(288)	(13)
14	22.3	20.8	168.5	170.8	63.9	60.1	79.3	69.7	13.7	10.6	10.3	9.4
	(266)	(20)	(267)	(20)	(266)	(20)	(266)	(20)	(264)	(20)	(256)	(20)
15	22.5	23.4	173.8	169.8	68.3	66.4	80.1	73.9	12.0	12.6	10.4	10.7
	(283)	(22)	(287)	(22)	(283)	(22)	(281)	(22)	(281)	(22)	(271)	(22)
FEMALE												
9	18.7	18.8	136.9	137.1	35.4	35.5	65.7	62.8	15.4	16.1	10.8	9.4
	(183)	(21)	(189)	(21)	(183)	(21)	(183)	(21)	(184)	(21)	(175)	(21)
10	19.3	18.3	143.3	142.4	40.0	37.5	68.0	62.1	15.5	17.4	11.9	12.6
	(163)	(18)	(164)	(18)	(164)	(18)	(164)	(18)	(163)	(18)	(156)	(18)
11	20.7	19.7	151.4	148.8	47.9	43.9	72.7	67.5	16.7	17.0	11.6	11.3
	(194)	(23)	(194)	(23)	(194)	(23)	(192)	(23)	(189)	(23)	(175)	(23)
13	22.7	21.6	159.1	160.7	57.7	55.9	78.8	70.6	18.0	17.9	14.1	12.2
	(321)	(14)	(325)	(14)	(321)	(14)	(320)	(14)	(310)	(14)	(296)	(14)
14	22.9	21.7	161.8	161.8	59.9	57.1	78.8	70.7	18.7	16.0	14.3	11.5
	(324)	(18)	(326)	(18)	(324)	(18)	(322)	(18)	(314)	(18)	(294)	(18)
15	23.2	24.1	161.9	162.5	61.1	64.0	78.8	75.5	18.3	19.2	14.4	15.5
	(266)	(19)	(274)	(19)	(266)	(19)	(265)	(19)	(258)	(19)	(244)	(19)

N: NHANES 1999-2002 data, H: the present study 2001-2002, data was collected from Houston, US. Height:standing height, Waist: waist circumference, SF: skinfold thickness. Values in parenthesis indicate number of observations for each statistic.

APPENDIX E

REGRESSION ANALYSIS

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Table 7-1. Regression of parenting style on parental socioeconomic status, work-related stresses, and body mass index for children

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**LR χ^2 (p value)**	**Pseudo. R^2** (size of n)
1) Both parents' authoritative style	Parents' average BMI	-82.09	-.22	.04	4.26 (.0389)	.04 (n=119)

Table 7-2. Regression of parenting style dimensions on parental socioeconomic status, work-related stresses, and body mass index for children

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Father's nurturing	Family income	.40	.19	.04	4.16 (.0438)	.03 (n=119)
2) Mother's control	Father's age – mother's age	-.02	-.20	.03	6.24 (.0027)	.08 (n=119)
	Father's BMI	20.10	.28	.00		
3) Father's control	Father's BMI	15.04	.21	.02	5.20 (.0244)	.03 (n=119)

Table 7-3. Regression of family meal behaviors on perception of parenting style and control variables for children

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Perception of family dinner ritual	Both parents' authoritative style	.51	.27	.02	9.34 (.0002)	.12 (n=125)
	Parents' average age	-.05	-.23	.01		
	Father's authoritative style	.43	.23	.01	7.56 (.0008)	.10 (n=125)
	Parents' average age	-.05	-.23	.01		
	Mother's authoritative style	.36	.20	.02	6.58 (.0019)	.08 (n=125)
	Parents' average age	-.05	-.23	.01		

Table 7-4. Regression of family meal behaviors on perception of parenting style dimensions and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Frequency of family lunch	Father's nurturing	.03	.24	.01	7.75 (.0062)	.05 (n=125)
2) Frequency of family dinner away from home	Mother's nurturing	.04	.26	.00	10.07 (<.0001)	.20 (n=109)
	Family income	.10	.34	.00		
	Father's BMI	55.58	.23	.01		
	Father's control	.67	.20	.00	8.15 (<.0001)	.17 (n=109)
	Family income	.11	.35	.00		
	Father's BMI	50.32	.20	.03		
3) Perception of family dinner ritual	Mother's nurturing	.04	.36	.00	13.48 (<.0001)	.17 (n=124)
	Parents' average age	-.04	-.21	.01		
	Father's nurturing	.05	.38	.00	13.92 (<.0001)	.17 (n=123)
	Parents' average age	-.04	-.20	.02		
4) Parents provide child's favorite foods	Mother's nurturing	.02	.22	.01	6.59 (.0114)	.04 (n=126)
5) Mother's criticism about child's eating	Mother's control	.56	.28	.00	8.22 (.0004)	.10 (n=125)
	Mother's education	.12	.20	.02		
	Father's control	.52	.26	.00	9.00 (.0033)	.06 (n=119)
6) Father's criticism about child's eating	Mother's control	.45	.26	.00	8.59 (.0040)	.06 (n=125)
	Father's control	.60	.34	.00	16.33 (<.0001)	.11 (n=126)

Table 7-5. Regression of self-concept on perception of parenting style and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Self esteem	Mother's authoritative style	3.28	.36	.00	13.32 (<.0001)	.18 (n=116)
	Family income	.27	.22	.01		
	Father's authoritative style	3.16	.34	.00	11.66 (<.0001)	.16 (n=116)
	Family income	.23	.18	.04		
	Both parents' authoritative style	3.51	.39	.00	14.65 (<.0001)	.19 (n=116)
	Family income	.25	.20	.02		
2) Mother's concern for child overweight	Mother's authoritative style	-.50	-.29	.00	9.38 (.0002)	.12 (n=127)
	White race	-.35	-.17	.04		
	Both parents' authoritative style	-.52	-.30	.00	9.97 (<.0001)	.12 (n=127)
	White race	-.40	-.20	.02		
3) Father's concern for child overweight	Mother's authoritative style	-.58	-.34	.00	16.09 (.0001)	.11 (n=125)
	Both parents' authoritative style	-.60	-.35	.00	17.01 (<.0001)	.11 (n=125)

Table 7-6. Regression of self-concept on perception of parenting style dimensions and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Self esteem	Mother's nurturing	.20	.37	.00	13.56 (<.0001)	.18 (n=115)
	Family income	.27	.22	.01		
	Mother's control	-3.59	-.27	.00	8.41 (.0004)	.12 (n=115)
	Family income	.26	.21	.02		
	Father's nurturing	.22	.37	.00	13.66 (<.0001)	.18 (n=115)
	Family income	.22	.18	.04		
	Father's control	-4.17	-.33	.00	11.42 (<.0001)	.15 (n=115)
	Family income	.31	.25	.01		
2) Mother's concern for child overweight	Mother's nurturing	-.02	-.20	.00	5.80 (.0039)	.07 (n=126)
	White race	-.42	-.21	.02		
	Mother's control	.70	.29	.00	9.41 (.0002)	.12 (n=126)
	White race	-.35	-.17	.05		
	Father's control	.43	.18	.04	5.28 (.0063)	.06 (n=126)
	White race	-.41	-.20	.02		
3) Father's concern for child overweight	Mother's nurturing	-.02	-.21	.02	5.38 (.0220)	.03 (n=124)
	Mother's control	.69	.28	.00	10.68 (.0014)	.07 (n=124)
	Father's control	.69	.28	.00	10.53 (.0015)	.07 (n=125)

Table 7-7. Regression of physical activity behaviors on perception of parenting style dimensions and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**LR χ^2 (p value)**	**Pseudo.R^2** (size of n)
1) Team sport participation	Father's nurturing	.07	.31	.01	16.78 (.0002)	.14 (n=113)
	Family income	.18	.36	.01		

Table 7-8. Regression of energy and nutrient intake on perception of parenting style and control variables for children

Variable of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Percent calorie from carbohydrates	Father's authoritative style	.16	.20	.02	6.14 (.0029)	.08 (n=126)
	Parents' average education	.08	.22	.01		
2) Percent calorie from saturated fat	Mother's authoritative style	-.98	-.19	.04	5.74 (.0042)	.07 (n=120)
	Father's education	-.49	-.24	.01		
3) Saturated fat	Mother's authoritative style	-.36	-.20	.03	4.96 (.0277)	.03 (n=125)

Table 7-9. Regression of energy and nutrient intake on perception of parenting style dimensions and control variables for children

Variable of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj.R^2** (size of n)
1) Percent calorie from carbohydrates	Mother's nurturing	.01	.19	.03	5.84 (.0038)	.07 (n=125)
	Parents' average education	.08	.21	.02		
2) Percent calorie from saturated fat	Father's control	.01	.18	.05	5.57 (.0049)	.07 (n=119)
	Father's education	-.005	-.24	.01		
3) Total Sugar	Father's control	.18	.19	.03	5.99 (.0002)	.14 (n=120)
	Maturity	.16	.20	.02		
	White race	.18	.23	.01		
	Physical activeness	-.13	-.19	.03		
4) Cholesterol	Father's control	2.03	.21	.02	7.17 (.0011)	.09 (n=126)
	Child's gender	-1.41	-.21	.02		

Table 7-10. Regression of self-concept on family meal behaviors and control variables for children

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value) / LR χ^2 (p value)	Adj. R^2 / Pseudo. R^2 (size of n)
1) Self esteem	Perception of family dinner ritual	1.32	.27	.00	8.55 (<.0001)	.17 (n=114)
	Father's criticism about child's eating	-1.58	-.22	.01		
	Family income	.30	.24	.01		
2) Mother's concern for child overweight	Perception of family dinner ritual	-.20	-.22	.01	7.06 (.0002)	.13 (n=126)
	Mother's criticism about child's eating	.26	.22	.01		
	White race	-.52	-.26	.00		
3) Father's concern for child overweight	Perception of family dinner ritual	-.24	-.25	.00	8.09 (<.0001)	.15 (n=124)
	Father's criticism about child's eating	.36	.26	.00		
	White race	-.38	-.19	.03		
4) Self perception of activity level	Frequency of family breakfast	.58	.35	.01	16.22 (.0010)	.13 (n=120)
	Father's education – mother's education	-.33	-.27	.04		
	White race	-1.05	-.25	.04		
5) Self perception of weight gain	Frequency of family dinner away from home	.37	.21	.04	4.35 (.0370)	.03 (n=127)

Table 7-11. Regression of eating behaviors on family meal behaviors and control variables for children

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Frequency of snacking	Frequency of family dinner	-.41	-.22	.02	5.09 (.0241)	.04 (n=127)
2) Frequency of food supplements intake	Parents provide child's favorite foods	.05	.22	.03	15.47 (.0004)	.13 (n=115)
	Family income	.16	.33	.00		
3) Present dieting	Frequency of family lunch	-.75	-.42	.01	7.10 (.0077)	.05 (n=127)

Table 7-12. Regression of physical activity behaviors on family meal behaviors and control variables for children

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Team sport participation	Perception of family dinner ritual	.66	.34	.01	24.13 (<.0001)	.19 (n=114)
	Frequency of family dinner away from home	.45	.29	.03		
	Family income	.18	.36	.01		

Table 7-13. Regression of energy and nutrient intake on family meal behaviors and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Percent calorie from carbohydrates	Frequency of family lunch	-.07	-.19	.03	4.85 (.0033)	.09 (n=120)
	Father's education	.06	.21	.02		
	Child's gender	.14	.18	.04		
2) Percent calorie from protein	Lack of food pressure from parents	-.08	-.17	.05	6.56 (.0020)	.08 (n=127)
	Child's gender	-.16	-.23	.01		
3) Percent calorie from saturated fat	Parents provide child's favorite foods	-.69	-.20	.03	6.03 (.0032)	.08 (n=120)
	Father's education	-.48	-.24	.01		
4) Percent DRI for iron	Frequency of family lunch	.07	.19	.03	5.38 (.0058)	.08 (n=127)
	Child's gender	-.17	-.22	.01		
5) Sodium	Frequency of family lunch	.06	.19	.04	4.60 (.0044)	.08 (n=127)
	Lack of food pressure from parents	.08	.20	.03		
	Parents' average BMI	14.23	.21	.02		
6) Cholesterol	Frequency of family lunch	.77	.23	.01	7.13 (<.0001)	.17 (n=119)
	Perception of family dinner ritual	.69	.18	.04		
	Child's gender	-1.90	-.28	.00		
	Father's BMI	137.89	.20	.02		

Table 7-14. Regression of physical outcomes on family meal behaviors and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**LR χ^2 (p value)**	**Pseudo R^2** (size of n)
1) At risk of overweight	Frequency of family lunch	-.74	-.41	.01	19.75 (.0002)	.15 (n=125)
	Perception of family dinner ritual	.68	.35	.03		
	Parents' average age	-.18	-.45	.00		

Table 7-15. Regression of energy and nutrient intake on eating behaviors and control variables for children

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Percent calorie from protein	Frequency of snacking	-.16	-.31	.00	10.53 (<.0001)	.20 (n=116)
	Child's gender	-.19	-.26	.00		
	Family income	-.02	-.18	.04		
2) Calorie per body weight	Frequency of skipping breakfast	-.31	-.17	.05	6.54 (.0020)	.08 (n=126)
	Parents' average education	.27	.25	.00		
3) Percent DRI for calcium	Frequency of skipping breakfast	-.66	-.26	.00	7.85 (.0006)	.10 (n=126)
	Mother's education	.21	.17	.05		
4) Percent DRI for iron	Frequency of skipping breakfast	-.18	-.28	.00	8.58 (.0003)	.11 (n=127)
	Child's gender	-.14	-.18	.04		
5) Percent DRI for folate	Frequency of skipping breakfast	-.31	-.31	.00	8.18 (.0005)	.11 (n=121)
	Father's education	.09	.19	.03		
6) Percent DRI for vitamin A	Frequency of skipping breakfast	-.75	-.19	.03	4.61 (.0338)	.03 (n=127)
7) Percent DRI for fiber	Frequency of skipping breakfast	-.17	-.28	.00	10.84 (<.0001)	.19 (n=127)
	Child's gender	.25	.35	.00		
	White race	-.18	-.21	.01		

Table 7-15. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
8) Total sugar	Frequency of snacking	.08	.18	.05	4.41 (.0057)	.08 (n=120)
	Maturity	.15	.19	.03		
	Mother's education	.05	.18	.05		
9) Sodium	TV watching while eating dinner	.10	.20	.03	4.92 (.0088)	.06 (n=126)
	Frequency of food supplements intake	-.07	-.18	.04		
10) Cholesterol	TV watching while eating dinner	.89	.17	.05	6.08 (.0030)	.07 (n=127)
	Child's gender	-1.68	-.25	.00		
11) Trans fat	Frequency of food supplements intake	-.10	-.18	.05	3.99 (.0480)	.02 (n=126)

Table 7-16. Regression of physical outcomes on eating behaviors and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Weight	Present dieting	.01	.25	.00	10.91 (<.0001)	.30 (n=119)
	Child's age	.01	.39	.00		
	Child's gender	-.01	-.18	.03		
	Parents' average BMI	.73	.19	.02		
	Parents' average age	-.0007	-.16	.05		
2) BMI	TV watching while eating dinner	.002	.16	.05	9.83 (<.0001)	.23 (n=119)
	Present dieting	.01	.28	.00		
	White race	-.005	-.24	.00		
	Parents' average BMI	.48	.24	.00		
3) BMI –z score	Present dieting	.93	.30	.00	12.47 (<.0001)	.23 (n=119)
	Child's gender	-.64	-.26	.00		
	Parents' average BMI	55.03	.26	.00		
4) Triceps skinfold	TV watching while eating dinner	.14	.23	.01	8.21 (<.0001)	.15 (n=126)
	Present dieting	.27	.23	.01		
	Parents' average age	-.02	-.19	.02		

Table 7-16. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)/ LR χ^2 (p value)**	**Adj. R^2 / Pseudo R^2** (size of n)
5) Subscapular skinfold	TV watching while eating dinner	1.69	.16	.05	11.37 (<.0001)	.26 (n=119)
	Present dieting	5.48	.26	.00		
	Parents' average age	-.32	-.20	.01		
	Parents' average BMI	440.19	.30	.00		
6) Waist	Present dieting	6.84	.20	.02	9.25 (.0002)	.12 (n=126)
	Parents' average age	-.67	-.27	.00		
7) Normal weight	Present dieting	-2.37	-.44	.00	25.03 (<.0001)	.19 (n=119)
	White race	.99	.23	.04		
	Parents' average BMI	-112.6	-.30	.01		
8) At risk of overweight	Present dieting	1.44	.26	.02	9.78 (.0075)	.08 (n=125)
	Mother's BMI	79.51	.32	.01		
9) Overweight	Present dieting	1.25	.22	.03	4.18 (.0409)	.03 (n=127)
10) Above normal weight	Present dieting	2.37	.44	.00	25.03 (<.0001)	.19 (n=119)
	Parents' average BMI	112.6	.30	.01		
	White race	-.99	-.23	.04		

Table 7-17. Regression of energy and nutrient intake on physical activity behaviors and control variables for children

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Percent calorie from fat	Frequency of sedentary activities	.93	.17	.05	4.86 (.0093)	.06 (n=126)
	Parents' average education	-1.02	-.21	.02		
2) Percent calorie from saturated fat	Frequency of sedentary activities	.62	.22	.01	6.72 (.0017)	.09 (n=120)
	Father's education	-.48	-.24	.01		
3) Percent DRI for Vitamin C	Frequency of sedentary activities	-.17	-.22	.01	5.14 (.0072)	.06 (n=126)
	Parents' average education	.12	.17	.05		
4) Total sugar	Regular exercise	-.12	-.17	.05	5.29 (.0019)	.10 (n=121)
	Maturity	.17	.22	.01		
	White race	.15	.20	.03		

Table 7-18. Regression of parenting style on parental socioeconomic status, work-related stresses, and body mass index for adolescents

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**LR χ^2 (p value)**	**Pseudo.R^2** (size of n)
1) Both parents' authoritative style	Father's work commitment	-.58	-.27	.03	5.01 (.0252)	.05 (n=98)

Table 7-19. Regression of parenting style dimensions on parental socioeconomic status, work-related stresses, and body mass index for adolescents

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Mother's nurturing	Father's work stress	-.39	-.27	.01	7.44 (.0010)	.12 (n=97)
	Father's BMI	-1.79	-.26	.01		
2) Father's nurturing	Father's work stress	-1.91	-.22	.03	5.25 (.0069)	.08 (n=97)
	Parents' average BMI	-10.29	-.23	.02		

Table 7-20. Regression of family meal behaviors on perception of parenting style and control variables for adolescents

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Frequency of family breakfast	Both parents' authoritative style	.82	.22	.04	10.48 (.0053)	.10 (n=97)
	Family income	-.13	-.27	.01		
2) Frequency of family lunch	Father's authoritative style	1.42	.28	.01	14.69 (.0006)	.13 (n=106)
	Mother's age	-.14	-.36	.00		
3) Frequency of family dinner	Father's authoritative style	1.22	.24	.02	4.90 (.0268)	.05 (n=107)
4) Frequency of family dinner away from home	Father's authoritative style	.96	.30	.00	9.96 (.0021)	.08 (n=106)
	Both parents' authoritative style	.53	.23	.02	5.63 (.0195)	.04 (n=106)
5) Perception of family dinner ritual	Father's authoritative style	1.10	.41	.00	13.85 (<.0001)	.20 (n=101)
	Father's BMI	-1.21	-.18	.04		
	Both parents' authoritative style	.60	.32	.00	11.38 (.0010)	.09 (n=105)
6) Lack of food pressure from parents	Both parents' authoritative style	.38	.24	.01	6.13 (.0149)	.05 (n=106)
7) Mother's criticism about child's eating	Mother's authoritative style	-.36	-.24	.01	5.70 (.0045)	.08 (n=106)
	Parents' average education	.14	.22	.02		
	Both parent' authoritative style	-.35	-.25	.01	5.86 (.0039)	.08 (n=106)
	Parents' average education	.14	.23	.02		

Table 7-21. Regression of family meal behaviors on perception of parenting style dimensions and control variables for adolescents

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Frequency of family breakfast	Mother's control	1.41	.22	.04	9.90 (.0071)	.10 (n=97)
	Family income	-.12	-.25	.02		
2) Frequency of family lunch	Father's nurturing	.08	.26	.01	14.29 (.0008)	.13 (n=105)
	Mother's age	-.14	-.34	.00		
	Mother's nurturing	.42	.23	.03	13.15 (.0014)	.12 (n=104)
	Mother's age	-.13	-.32	.00		
	Father's control	.39	.22	.04	12.59 (.0018)	.11 (n=105)
	Mother's age	-.11	-.27	.01		
3) Frequency of family dinner away from home	Father's nurturing	.06	.31	.00	7.28 (.0011)	.11 (n=105)
	Mother's education	.18	.19	.04		
4) Perception of family dinner ritual	Father's nurturing	.06	.39	.00	18.49 (<.0001)	.14 (n=105)
	Mother's nurturing	.28	.32	.00	11.50 (.0010)	.09 (n=104)
	Father's control	.18	.19	.05	3.95 (.0496)	.03 (n=105)
5) Lack of food pressure from parents	Mother's control	-.84	-.30	.00	10.31 (.0018)	.08 (n=105)
	Mother's nurturing	.18	.23	.02	5.86 (.0172)	.04 (n=105)
	Father's control	-.18	-.22	.02	5.38 (.0224)	.04 (n=106)

Table 7-21. Continued,

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
6) Parents provide child's favorite foods	Mother's nurturing	.67	.24	.01	6.28 (.0027)	.09 (n=104)
	Mother's education	-.51	-.23	.02		
	Father's nurturing	.09	.21	.03	5.46 (.0056)	.08 (n=105)
	Mother's education	-.48	-.21	.02		
7) Mother's criticism about child's eating	Mother's control	.60	.25	.01	5.49 (.0054)	.08 (n=105)
	Parents' average education	.16	.25	.01		

Table 7-22. Regression of self-concept on perception of parenting style and control variables for adolescents

Variables of concern	Predictors	Beta	Standard beta	P value	LR χ^2 (p value)	Pseudo. R^2 (size of n)
1) Self perception of overweight	Mother's authoritative style	-.15	-.24	.01	8.45 (<.0001)	.19 (n=97)
	Child's gender	.17	.31	.00		
	Parents' average BMI	.53	.26	.01		

Table 7-23. Regression of self-concept on perception of parenting style dimensions and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value) / LR χ^2 (p value)	Adj. R^2 / Pseudo. R^2 (size of n)
1) Self esteem	Father's nurturing	10.77	.27	.01	7.87 (.0060)	.06 (n=106)
2) Mother's concern for child overweight	Father's nurturing	-.03	-.21	.03	8.14 (.0005)	.13 (n=101)
	Parents' average BMI	1.58	.28	.00		
3) Self perception of weight gain	Father' control	-.60	-.33	.01	12.01 (.0025)	.11 (n=106)
	Child's gender	-.98	-.27	.03		
	Mother's nurturing	-.50	-.28	.02	5.50 (.0190)	.05 (n=105)
	Father's nurturing	-.07	-.25	.03	8.99 (.0112)	.08 (n=106)
	Child's gender	-.86	-.24	.05		

Table 7-24. Regression of eating behaviors on perception of parenting style dimensions and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Frequency of snacking	Mother's control	-1.92	-.30	.01	16.20 (.0010)	.14 (n=105)
	Child's age	.67	.29	.01		
	Child's gender	-.86	-.24	.04		

Table 7-25. Regression of physical activity behaviors on perception of parenting style and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Regular exercise	Father's authoritative style	1.40	.27	.02	5.82 (.0158)	.05 (n=106)
2) Frequency of hard exercise	Father's authoritative style	1.13	.22	.03	8.51 (.0142)	.08 (n=105)
	Mother's education	.28	.19	.05		
3) Team sport participation	Father's authoritative style	1.65	.31	.02	18.03 (.0001)	.17 (n=97)
	Family income	.21	.43	.00		

Table 7-26. Regression of physical activity behaviors on perception of parenting style dimensions and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Frequency of hard exercise	Father's nurturing	.06	.22	.03	9.07 (.0108)	.08 (n=105)
	Mother's education	.30	.21	.04		

Table 7-27. Regression of energy and nutrient intake on perception of parenting style and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Calorie per body weight	Mother's authoritative style	.19	.23	.01	7.46 (.0001)	.16 (n=105)
	Child's gender	-.22	-.28	.00		
	Mother's BMI	-13.18	-.25	.01		

Table 7-28. Regression of energy and nutrient intake on perception of parenting style dimensions and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Total calorie	Mother’s nurturing	-1.53	-.21	.02	16.10 (<.0001)	.23 (n=105)
	Child’s gender	-6.11	-.42	.00		
2) Calorie per body weight	Mother’s control	-.31	-.23	.01	7.29 (.0002)	.15 (n=104)
	Mother’s BMI	-12.54	-.24	.01		
	Child’s gender	-.22	-.29	.00		
3) Percent calorie from carbohydrates	Father’s control	-1.69	-.23	.02	4.42 (.0059)	.09 (n=101)
	Father’s age – mother’s age	-.35	-.21	.03		
	Child’s age	1.28	.14	.15		
4) Percent calorie from fat	Father’s control	1.25	.23	.02	5.76 (.0182)	.04 (n=106)
5) Sodium	Father nurturing	-.31	-.20	.03	6.27 (.0027)	.09 (n=106)
	Child gender	-5.06	-.26	.01		
6) Percent DRI for fiber	Mother’s control	-1.39	-.30	.00	7.84 (<.0001)	.16 (n=105)
	Child’s gender	.52	.19	.03		
	White race	.71	.22	.02		
	Father’s control	-.33	-.25	.01	6.69 (.0004)	.14 (n=106)
	Child’s gender	.50	.19	.04		
	White race	.75	.23	.01		
7) Saturated fat	Mother’s nurturing	-.22	-.19	.05	4.06 (<.0201)	.06 (n=104)
	Mother’s BMI	-31.45	-.21	.03		

Table 7-29. Regression of physical outcomes on perception of parenting styles and control variables for adolescents

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)/ LR χ^2 (p value)**	**Adj. R^2 / Pseudo R^2** (size of n)
1) Weight	Mother's authoritative style	-.01	-.27	.00	10.91 (<.0001)	.23 (n=101)
	Child's age	.004	.21	.02		
	Parents' average BMI	.03	.34	.00		
2) BMI	Mother's authoritative style	-.01	-.31	.00	14.71 (<.0001)	.22 (n=101)
	Parents' average BMI	.02	.36	.00		
	Both parents' authoritative style	-.003	-.20	.03	10.34 (<.0001)	.16 (n=101)
	Parents' average BMI	.02	.35	.00		
3) BMI –z score	Mother's authoritative style	-.57	-.28	.00	12.58 (<.0001)	.19 (n=101)
	Parent' average BMI	2.39	.35	.00		
4) Subscapular skinfold	Mother's authoritative style	-.21	-.21	.02	6.21 (.0029)	.09 (n=105)
	Child's gender	.23	.25	.01		
5) Waist	Mother's authoritative style	-5.54	-.22	.02	5.19 (.0247)	.04 (n=106)
6) Normal weight	Mother's authoritative style	1.55	.40	.00	12.54 (.0004)	.11 (n=106)
	Both parents' authoritative style	1.09	.29	.01	6.82 (.0090)	.06 (n=106)

Table 7-29. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**LR χ^2 (p value)**	**Pseudo R^2** (size of n)
7) At risk of overweight	Mother's authoritative style	-1.40	-.36	.01	7.75 (.0054)	.07 (n=106)
8) Above normal weight	Mother's authoritative style	-1.62	-.42	.00	13.64 (.0002)	.12 (n=106)
	Both parents' authoritative style	-1.17	-.32	.01	7.77 (.0053)	.07 (n=106)

Table 7-30. Regression of physical outcomes on perception of parenting style dimensions and control variables for adolescents

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)/ LR χ^2 (p value)	Adj. R^2 / Pseudo R^2 (size of n)
1) Weight	Mother's control	.01	.22	.02	9.61 (<.0001)	.21 (n=100)
	Child's age	.004	.23	.01		
	Parents' average BMI	.03	.35	.00		
2) BMI	Mother's control	.01	.26	.01	12.05 (<.0001)	.18 (n=100)
	Parents' average BMI	.02	.36	.00		
3) BMI –z score	Mother's control	.77	.23	.01	10.55 (<.0001)	.16 (n=100)
	Parents' average BMI	2.40	.35	.00		
4) Subscapular skinfold	Mother's control	.32	.20	.04	5.53 (.0052)	.08 (n=104)
	Child's gender	.23	.25	.01		
5) Waist	Mother's control	10.20	.25	.01	6.60 (.0116)	.05 (n=105)
6) Normal weight	Mother's nurturing	.45	.25	.03	4.66 (.0309)	.04 (n=105)
	Mother's control	-2.99	-.47	.00	14.54 (.0001)	.13 (n=105)
7) At risk of overweight	Mother's control	1.88	.30	.04	4.55 (.0329)	.04 (n=105)
8) Overweight	Mother's control	2.38	.38	.02	5.76 (.0164)	.05 (n=105)
9) Above normal weight	Mother's control	2.86	.45	.00	13.34 (.0003)	.12 (n=105)
	Mother's nurturing	-.50	-.28	.02	5.75 (.0165)	.05 (n=105)

Table 7-31. Regression of self-concept on family meal behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value) / LR χ^2 (p value)	Adj. R^2 Pseudo. R^2 (size of n)
1) Self esteem	Frequency of family dinner	77.27	.21	.03	5.51 (.0053)	.08 (n=106)
	Parents provide child's favorite foods	18.84	.21	.03		
2) Mother's concern for child overweight	Mother's criticism about child's eating	.31	.27	.00	10.10 (.0001)	.15 (n=101)
	Parents' average BMI	1.76	.31	.00		
3) Father's concern for child overweight	Father's criticism about child's eating	.30	.28	.00	7.18 (.0012)	.11 (n=102)
	Father's BMI	1.19	.23	.02		
4) Self perception of weight gain	Perception of family dinner ritual	-.62	-.31	.01	7.21 (.0073)	.07 (n=106)

Table 7-32. Regression of eating behaviors on family meal behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Frequency of skipping breakfast	Perception of family dinner ritual	-.67	-.34	.00	18.60 (<.0001)	.17 (n=99)
	Lack of food pressure from parents	.82	.37	01		
2) Frequency of snacking	Perception of family dinner ritual	-.59	-.30	.01	11.60 (.0030)	.10 (n=105)
	Mother's criticism about child's eating	.63	.24	.04		
3) TV watching while eating dinner	Lack of food pressure from parents	.69	.30	.01	12.01 (.0025)	.11 (n=106)
	Parents' average education	-.46	-.28	.01		

Table 7-33. Regression of physical activity behaviors on family meal behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Frequency of hard exercise	Frequency of family lunch	-.61	-.26	.01	6.85 (.0088)	.06 (n=106)
2) Frequency of sedentary activities	Parents provide child's favorite foods	.21	.33	.00	27.59 (<.0001)	.23 (n=105)
	Parents' average age	.22	.50	.00		
	White race	-1.69	-.38	.00		

Table 7-34. Regression of energy and nutrient intake on family meal behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Total calorie	Lack of food pressure from parents	-2.19	-.24	.01	12.98 (<.0001)	.26 (n=105)
	Perception of family dinner ritual	-1.45	-.18	.03		
	Child's gender	-6.27	-.44	.00		
2) Calorie per body weight	Lack of food pressure from parents	-.12	-.23	.01	7.54 (.0001)	.16 (n=105)
	Child's gender	-.22	-.28	.00		
	Mother's BMI	-9.79	-.19	.04		
3) Percent calorie from total fat	Frequency of family lunch	1.36	.19	.05	3.97 (.0490)	.03 (n=106)
4) Percent DRI for calcium	Lack of food pressure from parents	-.22	-.29	.00	8.38 (.0004)	.12 (n=106)
	Child's gender	-.28	-.23	.01		
5) Percent DRI for iron	Lack of food pressure from parents	-.19	-.27	.00	17.67 (<.0001)	.32 (n=106)
	Child's gender	-.50	-.43	.00		
	Child's age	-.21	-.29	.00		
6) Percent DRI for folate	Lack of food pressure from parents	-.22	-.25	.01	7.99 (<.0001)	.17 (n=105)
	Mother's BMI	-18.01	-.19	.04		
	Child's gender	-.40	-.28	.00		

Table 7-34. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
7) Percent DRI for vitamin A	Lack of food pressure from parents	-.34	-.28	.00	8.56 (.0004)	.13 (n=106)
	Parents' average education	.26	.30	.00		
8) Percent DRI for dietary fiber	Frequency of family dinner away from home	-.25	-.22	.02	5.98 (.0008)	.12 (n=106)
	Child's gender	.55	.21	.02		
	White race	.87	.27	.00		
9) Sodium	Lack of food pressure from parents	-2.37	-.19	.04	6.05 (.0033)	.09 (n=106)
	Child's gender	-5.09	-.26	.01		
10) Cholesterol	Lack of food pressure from parents	-.97	-.18	.05	8.42 (.0004)	.12 (n=106)
	Child's gender	-2.70	-.33	.00		

Table 7-35. Regression of physical outcomes on family meal behaviors and control variables for adolescents

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Waist	Father's criticism about child's eating	3.36	.30	.03	9.64 (<.0001)	.21 (n=101)
	Father's age – mother's age	-.70	-.26	.01		
	Parents' average BMI	30.37	.36	.00		

Table 7-36. Regression of energy and nutrient intake on eating behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Total calorie	Frequency of skipping breakfast	-2.03	-.21	.01	14.65 (<.0001)	.29 (n=100)
	Frequency of snacking	3.20	.26	.00		
	Child's gender	-5.31	-.36	.00		
2) Calorie per body weight	Frequency of skipping breakfast	-.19	-.37	.00	13.13 (<.0001)	.27 (n=100)
	Frequency of snacking	.16	.24	.01		
	Child's gender	-.16	-.20	.02		
3) Percent calorie from protein	Frequency of snacking	-.01	-.25	.01	6.97 (.0003)	.15 (n=101)
	Father's age –mother's age	.002	.22	.02		
	White race	-.02	-.26	.01		
4) Percent calorie from fat	Frequency of skipping breakfast	1.53	.21	.03	4.72 (.0322)	.04 (n=100)
5) Percent calorie from saturated fat	TV watching while eating dinner	.73	.20	.04	4.62 (.0120)	.07 (n=105)
	Mother's BMI	-86.42	-.24	.01		
6) Percent DRI for calcium	Frequency of skipping breakfast	-.31	-.39	.00	19.36 (<.0001)	.27 (n=100)
	Frequency of snacking	.31	.30	.00		
7) Percent DRI for iron	Frequency of skipping breakfast	-.32	-.43	.00	26.62 (<.0001)	.34 (n=100)
	Child's gender	-.46	-.40	.00		

Table 7-36. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
8) Percent DRI for folate	Frequency of skipping breakfast	-.32	-.35	.00	10.36 (<.0001)	.22 (n=99)
	Child's gender	-.37	-.26	.00		
	Mother's BMI	-17.49	-.19	.04		
9) Percent DRI for vitamin A	Frequency of skipping breakfast	-.46	-.36	.00	12.97 (<.0001)	.19 (n=100)
	Parents' average education	.27	.31	.00		
10) Percent DRI for vitamin C	Frequency of skipping breakfast	-.35	-.33	.00	8.04 (.0006)	.12 (n=100)
	White race	.37	.18	.05		
11) Percent DRI for fiber	Frequency of skipping breakfast	-.46	-.27	.00	7.21 (<.0001)	.20 (n=100)
	Frequency of snacking	.49	.21	.03		
	Child's gender	.63	.24	.01		
	White race	.88	.27	.00		
12) Total sugar	Frequency of skipping breakfast	-1.03	-.30	.00	12.27 (<.0001)	.37 (n=95)
	Frequency of snacking	.85	.19	.04		
	Child's gender	-1.57	-.29	.00		
	Child's age	.97	.29	.00		
	Father's age –mother's age	-.12	-.20	.02		

Table 7-36. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
13) Sodium	Frequency of snacking	3.25	.20	.04	6.23 (.0028)	.09 (n=106)
	Child's gender	-4.40	-.23	.02		
14) Cholesterol	Frequency of skipping breakfast	-1.00	-.19	.05	6.52 (.0005)	.14 (n=100)
	TV watching while eating dinner	1.10	.20	.04		
	Child's gender	-2.46	-.30	.00		
15) Saturated fat	Frequency of snacking	.63	.34	.00	13.57 (.0004)	.11 (n=106)

Table 7-37. Regression of physical outcomes on eating behaviors and control variables for adolescents

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Weight	Frequency of skipping breakfast	.005	.30	.00	11.41 (<.0001)	.25 (n=95)
	Child's age	.003	.20	.03		
	Parents' average BMI	.03	.33	.00		
2) BMI	Frequency of skipping breakfast	.003	.26	.01	9.92 (<.0001)	.22 (n=95)
	Frequency of snacking	-.003	-.18	.05		
	Parents' average BMI	.02	.32	.00		
3) BMI –z score	Frequency of skipping breakfast	.27	.22	.02	10.11 (<.0001)	.23 (n=95)
	Frequency of snacking	-.39	-.24	.01		
	Parents' average BMI	2.07	.31	.00		
4) Triceps skinfold	Present dieting	.58	.18	.04	10.33 (<.0001)	.27 (n=101)
	Child's gender	.54	.30	.00		
	Parents' average BMI	1.77	.27	.00		
	Parents' average age	-.05	-.23	.01		
5) Subscapular skinfold	Present dieting	.52	.32	.00	12.45 (<.0001)	.19 (n=100)
	Parents' average BMI	.94	.29	.00		
6) Waist	Present dieting	10.42	.25	.01	10.93 (<.0001)	.23 (n=101)
	Parents' average BMI	27.75	.33	.00		
	Father's age- mother's age	-.74	-.27	.00		

Table 7-37. Continued,

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (p value)	Pseudo R^2 (size of n)
7) Overweight	Present dieting	1.76	.28	.03	15.91 (.0004)	.15 (n=101)
	Parents' average BMI	7.01	.54	.00		

Table 7-38. Regression of energy and nutrient intake on physical activity behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Percent calorie from fat	Frequency of hard exercise	-.92	-.21	.03	4.77 (.0311)	.03 (n=106)
2) Percent calorie from saturated fat	Frequency of hard exercise	-.42	-.19	.04	4.46 (.0139)	.06 (n=105)
	Mother's BMI	-82.83	-.23	.02		
3) Calorie per body weight	Frequency of light exercise	.07	.22	.02	7.16 (.0002)	.15 (n=105)
	Child's gender	-.23	-.29	.00		
	Mother's BMI	-13.03	-.25	.01		
4) Percent DRI for vitamin A	Frequency of sedentary activities	-.21	-.22	.02	6.48 (.0022)	.10 (n=105)
	Parents' average education	.24	.27	.01		

Table 7-39. Regression of physical outcomes on physical activity behaviors and control variables for adolescents

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Triceps skinfold	Frequency of hard exercise	-.13	-.18	.05	10.15 (<.0001)	.22 (n=101)
	Child's gender	.67	.37	.00		
	Parents' average BMI	1.68	.26	.00		
2) Subscapular skinfold	Frequency of hard exercise	-.07	-.19	.05	7.61 (.0001)	.17 (n=100)
	Parents' average BMI	1.00	.30	.00		
	Child's gender	.21	.23	.01		

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Table 7-40. Regression of parenting style on parental socioeconomic status, work-related stresses, and body mass index for male subjects

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**LR χ^2 (p value)**	**Pseudo.R^2** (size of n)
1) Father's authoritative style	Father's work stress	-.61		.03	8.61 (.0135)	.07 (n=113)

Table 7-41. Regression of parenting style dimensions on parental socioeconomic status, work-related stresses, and body mass index for male subjects

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Mother's control	Father's BMI	10.91	.23	.01	7.22 (.0011)	.10 (n=115)
	Father's age	-.01	-.27	.00		
2) Father's control	Mother's age	-.03	-.22	.01	6.16 (.0145)	.04 (n=120)

Table 7-42. Regression of family meal behaviors on perception of parenting style and control variables for male subjects

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Frequency of family breakfast	Mother's authoritative style	.66	.20	.03	6.13 (.0029)	.08 (n=123)
	Child's age	-.17	-.21	.02		
2) Frequency of family lunch	Father's authoritative style	.60	.18	.05	4.55 (.0125)	.06 (n=122)
	Parents' average age	-.06	-.18	.04		
	Both parents' authoritative style	.57	.17	.05	4.77 (.0102)	.06 (n=121)
	Parents' average age	-.06	-.18	.04		
3) Frequency of family dinner away from home	Mother's authoritative style	.58	.25	.00	9.96 (.0001)	.13 (n=117)
	Family income	.09	.28	.00		
	Both parents' authoritative style	.43	.19	.04	7.74 (.0007)	.10 (n=116)
	Family income	.09	.28	.00		
4) Perception of family dinner ritual	Father's authoritative style	.44	.39	.00	11.04 (<.0001)	.20 (n=122)
	Child's age	-.51	-.19	.02		
	Child's activity level	2.02	.17	.04		
	Both parents' authoritative style	4.64	.41	.00	24.53 (<.0001)	.16 (n=121)
	Mother' authoritative style	3.58	.31	.00	13.14 (.0004)	.09 (n=122)

Table 7-42. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
5) Lack of food pressure from parents	Both parents' authoritative style	.38	.24	.01	6.55 (.0020)	.08 (n=122)
	Child's age	.09	.24	.01		
6) Parents provide child's favorite foods	Both parents' authoritative style	1.34	.20	.02	6.04 (.0007)	.11 (n=121)
	Parents' average age	-.17	-.25	.01		
	Child's age	.44	.28	.00		
7) Mother's criticism about child's eating	Both parents' authoritative style	-.28	-.18	.05	4.58 (.0122)	.06 (n=116)
	Father's education	.11	.19	.04		

Table 7-43. Regression of family meal behaviors on perception of parenting style dimensions for male subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Frequency of family lunch	Mother's nurturing	.06	.23	.01	6.02 (.0003)	.08 (n=121)
	Parents' average age	-.06	-.19	.04		
	Father's nurturing	.07	.29	.00	8.64 (.0003)	.11 (n=121)
	Parents' average age	-.07	-.19	.03		
2) Frequency of family dinner	Father's nurturing	.05	.26	.00	8.83 (.0003)	.12 (n=120)
	Mother's BMI	-41.93	-.26	.00		
3) Frequency of family dinner away from home	Mother's nurturing	.05	.26	.00	10.36 (<.0001)	.14 (n=116)
	Family income	.09	.29	.00		
	Father's nurturing	.04	.20	.02	8.14 (.0005)	.11 (n=116)
	Family income	.09	.27	.00		
4) Perception of family dinner ritual	Father's nurturing	.40	.44	.00	17.70 (<.0001)	.22 (n=121)
	Child's age	-.43	-.16	.05		
	Mother's nurturing	.29	.32	.00	13.88 (.0003)	.10 (n=121)
	Mother's control	5.04	.20	.03	5.07 (.0262)	.03 (n=120)
	Father's control	1.58	.20	.03	5.01 (.0271)	.03 (n=121)
5) Lack of food pressure from parents	Mother's control	-.67	-.19	.03	5.30 (.0062)	.07 (n=121)
	Child's age	.07	.20	.02		

Table 7-43. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
6) Parents provide child's favorite foods	Mother's nurturing	.11	.20	.02	5.70 (.0011)	.11 (n=121)
	Parents' average age	-.17	-.25	.01		
	Child's age	.43	.27	.00		
	Father's nurturing	.11	.21	.01	6.41 (.0005)	.12 (n=121)
	Parents' average age	-.19	-.27	.00		
	Child's age	.44	.28	.00		
7) Mother's criticism about child's eating	Mother's control	1.01	.31	.00	8.38 (<.0001)	.16 (n=115)
	Father's education	.11	.20	.03		
	White race	.39	.22	.01		
8) Father's criticism about child's eating	Mother's control	.80	.26	.01	7.41 (.0014)	.10 (n=114)
	Father's education	.14	.26	.00		
	Father's control	.24	.25	.01	7.16 (.0012)	.10 (n=116)
	Father's education	.14	.25	.01		

Table 7-44. Regression of self-concept on perception of parenting style for male subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Self esteem	Mother's authoritative style	5119.0	.18	.04	5.67 (.0012)	.11 (n=118)
	Mother's education	2258.9	.20	.02		
	Maturity	6222.6	.23	.01		
	Father's authoritative style	10260	.37	.00	11.42 (<.0001)	.21 (n=118)
	Mother's education	2621.3	.23	.01		
	Maturity	5608.0	.20	.01		
	Both parents' authoritative style	8795.5	.32	.00	9.24 (<.0001)	.18 (n=117)
	Mother's education	2494.6	.22	.01		
	Maturity	6658.5	.24	.01		

Table 7-45. Regression of self-concept on perception of parenting style dimensions for male subjects with control variables

Variable of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Self esteem	Mother's nurturing	646.8	.31	.00	9.80 (<.0001)	.19 (n=117)
	Mother's education	2201.4	.20	.02		
	Maturity	6709.8	.25	.00		
	Father's nurturing	939.5	.43	.00	14.66 (<.0001)	.26 (n=117)
	Mother's education	2371.2	.21	.01		
	Maturity	6028.4	.22	.01		

Table 7-46. Regression of eating behaviors on perception of parenting style for male subjects with control variables

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (p value)	Pseudo.R^2 (size of n)
1) Frequency of snacking	Father's authoritative style	-.83	-.23	.02	12.22 (.0022)	.10 (n=121)
	White race	.93	.25	.01		

Table 7-47. Regression of eating behaviors on perception of parenting style dimensions for male subjects with control variables

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (p value)	Pseudo.R^2 (size of n)
1) Frequency of snacking	Father's nurturing	-.10	-.36	.00	18.59 (<.0001)	.14 (n=119)
	Maturity	.85	.23	.02		
2) Present dieting	Mother's control	3.62	.45	.03	13.94 (.0009)	.11 (n=118)
	Maturity	-2.63	-.72	.02		

Table 7-48. Regression of physical activity behaviors on perception of parenting style for male subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**LR χ^2 (p value)**	**Pseudo. R^2** (size of n)
1) Regular exercise	Mother's authoritative style	.86	.23	.03	7.70 (.0213)	.06 (n=123)
	Child's age	.18	.21	.05		
2) Frequency of hard exercise	Mother's authoritative style	1.07	.29	.00	17.79 (.0005)	.14 (n=116)
	Mother's age	.12	.33	.00		
	Father's BMI	84.02	.22	.03		
	Both parents' authoritative style	.84	.23	.02	14.79 (.0020)	.12 (n=115)
	Mother's age	.11	.31	.00		
	Father's BMI	78.12	.20	.05		
3) Frequency of sedentary activities	Both parents' authoritative style	1.04	.29	.00	17.65 (.0005)	.14 (n=120)
	Mother's age	.10	.28	.01		
	White race	-1.08	-.26	.02		
	Mother's authoritative style	.82	.23	.02	14.97 (.0018)	.12 (n=121)
	Mother's age	.10	.29	.01		
	White race	-1.31	-.31	.00		
	Father's authoritative style	.76	.21	.03	14.22 (.0026)	.11 (n=121)
	Mother's age	.08	.24	.03		
	White race	-1.17	-.28	.01		

Table 7-49. Regression of physical activity behaviors on perception of parenting style dimensions for male subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**LR χ^2 (p value)**	**Pseudo.R^2** (size of n)
1) Frequency of sedentary activities	Mother's nurturing	.09	.31	.00	18.79 (.0003)	.14 (n=120)
	Mother's age	.10	.28	.01		
	White race	-1.24	-.29	.01		
	Father's nurturing	.06	.20	.04	13.90 (.0030)	.11 (n=120)
	Mother's age	.09	.25	.02		
	White race	-1.21	-.29	.01		

Table 7-50. Regression of energy and nutrient intake on perception of parenting style for male subjects with control variables

Variable of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Total sugar	Mother's authoritative style	-1.01	-.21	.02	7.89 (.0006)	.10 (n=120)
	Maturity	1.24	.26	.00		
2) Saturated fat	Mother authoritative style	-.13	-.18	.05	4.18 (.0177)	.05 (n=120)
	Mother's BMI	-8.78	-.18	.04		

Table 7-51. Regression of energy and nutrient intake on perception of parenting style dimensions for male subjects with control variables

Variable of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Percent calorie from fat	Mother's control	-4.81	-.22	.01	8.70 (.0003)	.11 (n=120)
	Parents' average education	-1.37	-.29	.00		
2) Percent calorie from protein	Father's nurturing	.0008	.18	.05	4.25 (.0164)	.05 (n=122)
	Child's activity level	.01	.17	.05		
3) Percent DRI for fiber	Father's control	-.98	-.24	.01	7.56 (.0069)	.05 (n=122)

Table 7-52. Regression of physical outcomes on perception of parenting style dimensions for male subjects with control variables

Variable of concern	Predictors	Beta	Standard beta	P value	F value (p value)/ LR χ^2 (p value)	Adj.R^2/ Pseudo. R^2 (size of n)
1) Height	Father's control	-2.52	-.12	.03	123.26 (<.0001)	.67 (n=122)
	Child's age	5.82	.80	.00		
2) Normal weight	Father's control	-.76	-.30	.01	11.94 (.0025)	.10 (n=116)
	Family income	.14	.27	.02		
3) Above normal weight	Father's control	.80	.32	.01	11.98 (.0025)	.10 (n=116)
	Family income	-.13	-.26	.03		

Table 7-53. Regression of self-concept on family meal behaviors and control variables for male subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value) / LR χ^2 (p value)	Adj. R^2 Pseudo. R^2 (size of n)
1) Self esteem	Perception of family dinner ritual	628.18	.26	.00	11.55 (<.0001)	.31 (n=117)
	Frequency of family dinner	2649.58	.24	.00		
	Parents provide child's favorite foods	888.95	.21	.01		
	Mother's education	2675.76	.24	.00		
	Maturity	7051.63	.26	.00		
2) Mother's concern for child overweight	Frequency of family lunch	-.07	-.28	.00	9.56 (<.0001)	.18 (n=117)
	Mother's criticism about child's eating	.14	.26	.00		
	Father's age	-.02	-.31	.00		
3) Father's concern for child overweight	Frequency of family lunch	-.07	-.27	.00	12.04 (<.0001)	.22 (n=116)
	Father's criticism about child's eating	.19	.33	.00		
	Father's age	-.02	-.29	.00		
4) Self perception of activity level	Perception of family dinner ritual	.11	.33	.01	11.36 (.0034)	.09 (n=120)
	Mother's age	.09	.26	.03		
5) Self perception of weight gain	Perception of family dinner ritual	-.07	-.23	.03	4.80 (.0284)	.04 (n=122)

Table 7-54. Regression of eating behaviors on family meal behaviors and control variables for male subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Frequency of skipping breakfast	Frequency of family breakfast	-.50	-.46	.00	25.20 (<.0001)	.19 (n=123)
	Lack of food pressure from parents	.72	.32	.01		
2) Frequency of snacking	Frequency of family dinner	-.59	-.40	.00	16.59 (.0002)	.13 (n=121)
	Mother's BMI	-63.47	-.26	.01		
3) Frequency of food supplements intake	Frequency of family breakfast	.29	.26	.01	18.28 (.0004)	.14 (n=120)
	Father's criticism about child's eating	-.79	-.31	.01		
	Mother's education	.31	.21	.04		
4) TV watching while eating dinner	Mother's criticism about child's eating	-.63	-.26	.01	12.12 (.0023)	.10 (n=120)
	Maturity	.89	.24	.01		
5) Present dieting	Frequency of family dinner away from home	-.97	-.62	.03	29.36 (<.0001)	.21 (n=122)
	Frequency of family lunch	-.60	-.54	.03		
	Father's criticism about child's eating	1.71	.67	.02		
	Child's age	-.76	-.90	.00		

Table 7-55. Regression of physical activity behaviors on family meal behaviors and control variables for male subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Regular exercise	Perception of family dinner ritual	.08	.25	.03	7.66 (.0217)	.06 (n=122)
	Child's age	.18	.22	.05		
2) Team sport participation	Perception of family dinner ritual	.16	.49	.00	26.70 (<.0001)	.21 (n=115)
	Family income	.27	.54	.00		

Table 7-56. Regression of energy and nutrient intake on family meal behaviors and control variables for male subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Percent calorie from protein	Perception of family dinner ritual	.00089	.18	.04	6.85 (.0015)	.09 (n=122)
	White race	-.02	-.25	.00		
2) Calorie per body weight	Parents provide child's favorite foods	-.02	-.16	.05	11.57 (<.0001)	.21 (n=121)
	Child's age	-.07	-.38	.00		
	Mother's BMI	-9.85	-.19	.02		
3) Percent DRI for calcium	Frequency of family dinner away from home	-.67	-.18	.04	6.19 (.0028)	.08 (n=121)
	Mother's BMI	-131.78	-.24	.01		
4) Percent DRI for iron	Frequency of family dinner away from home	-.07	-.18	.04	5.70 (.0043)	.07 (n=123)
	Child's age	-.05	-.24	.01		

Table 7-57. Regression of physical outcomes on family meal behaviors and control variables for male subjects

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)/ LR χ^2 (p value)	Adj. R^2 / Pseudo R^2 (size of n)
1) BMI	Frequency of family lunch	-.00099	-.17	.05	8.01 (.0005)	.10 (n=123)
	Child's age	.0012	.28	.00		
2) Triceps skinfold	Frequency of family lunch	-.06	-.20	.03	6.14 (.0029)	.08 (n=119)
	Perception of family dinner ritual	.02	.19	.03		
	Maturity	-.21	-.22	.02		
3) Subscapular skinfold	Frequency of family lunch	-.08	-.25	.00	8.83 (<.0001)	.22 (n=114)
	Perception of family dinner ritual	.02	.18	.04		
	Parents' average age	-.04	-.34	.00		
	Parents' average BMI	8.72	.21	.01		
4) Overweight	Frequency of family lunch	-.37	-.34	.01	16.36 (.0003)	.12 (n=122)
	White race	-1.65	-.39	.00		

Table 7-58. Regression of energy and nutrient intake on eating behaviors and control variables for male subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Total calorie	Frequency of skipping breakfast	-.11	-.27	.00	7.46 (.0001)	.14 (n=123)
	Frequency of snacking	.05	.17	.05		
	Child's age	.04	.29	.00		
2) Calorie per body weight	Frequency of skipping breakfast	-.18	-.31	.00	16.44 (<.0001)	.28 (n=123)
	Frequency of snacking	.08	.22	.01		
	Child's age	-.06	-.35	.00		
3) Percent calorie from saturated fat	Frequency of snacking	.47	.19	.04	6.05 (.0032)	.08 (n=117)
	Father's education	-.42	-.22	.02		
4) Percent calorie from protein	Frequency of snacking	-.006	-.21	.02	7.52 (.0008)	.10 (n=123)
	White race	-.02	-.27	.00		
5) Percent DRI for calcium	Frequency of skipping breakfast	-2.63	-.41	.00	17.32 (<.0001)	.21 (n=121)
	Mother's BMI	-133.75	-.24	.00		
6) Percent DRI for iron	Frequency of skipping breakfast	-.31	-.45	.00	30.73 (<.0001)	.20 (n=123)
7) Percent DRI for folate	Frequency of skipping breakfast	-.40	-.38	.00	14.30 (<.0001)	.18 (n=123)
	TV watching while eating dinner	-.17	-.19	.02		

Table 7-58. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
8) Percent DRI for vitamin A	Frequency of skipping breakfast	-2.49	-.29	.00	10.34 (<.0001)	.14 (n=120)
	Maturity	-2.21	-.19	.03		
9) Percent DRI for vitamin C	Frequency of skipping breakfast	-.40	-.33	.00	15.07 (.0002)	.10 (n=123)
10) Percent DRI for fiber	Frequency of skipping breakfast	-1.22	-.28	.00	10.22 (.0018)	.07 (n=123)
11) Total sugar	Frequency of skipping breakfast	-1.02	-.28	.00	8.58 (<.0001)	.16 (n=120)
	Frequency of snacking	.43	.18	.04		
	Maturity	1.50	.31	.00		
12) Sodium	TV watching while eating dinner	.08	.18	.05	3.97 (.0487)	.02 (n=123)
13) Cholesterol	TV watching while eating dinner	.12	.19	.03	5.98 (.0008)	.12 (n=116)
	Father's age –mother's age	.02	.18	.04		
	Child's activity level	.29	.28	.00		
14) Saturated fat	Frequency of skipping breakfast	-.09	-.17	.05	7.59 (.0008)	.10 (n=123)
	Frequency of snacking	.11	.30	.00		

Table 7-59. Regression of physical outcomes on eating behaviors and control variables for male subjects

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)/ LR χ^2 (p value)**	**Adj. R^2 / Pseudo R^2** (size of n)
1) BMI -z score	Frequency of snacking	-.26	-.25	.00	8.92 (<.0001)	.17 (n=116)
	Parents' average age	-.06	-.28	.00		
	Parents' average BMI	17.93	.21	.01		
2) Triceps skinfold	Frequency of snacking	-.14	-.28	.00	8.80 (<.0001)	.22 (n=114)
	TV watching while eating dinner	.14	.22	.01		
	Father's age	-.02	-.26	.00		
	Maturity	-.19	-.20	.03		
3) Subscapular skinfold	TV watching while eating dinner	.12	.17	.04	9.09 (<.0001)	.18 (n=115)
	Parents' average age	-.03	-.32	.00		
	Parents' average BMI	8.99	.22	.01		
4) Normal weight	Present dieting	-1.93	-.29	.03	16.13 (.0011)	.13 (n=116)
	White race	1.04	.24	.03		
	Parents' average BMI	-34.91	-.24	.04		
5) Above normal weight	Frequency of snacking	-.57	-.31	.01	20.20 (.0002)	.16 (n=116)
	Parents' average age	-.13	-.36	.01		
	Parents' average BMI	36.38	.25	.03		
6) Overweight	Present dieting	2.17	.31	.01	23.27 (<.0001)	.17 (n=122)
	Parents' average age	-.20	-.53	.00		

Table 7-60. Regression of energy and nutrient intake on physical activity behaviors and control variables for male subjects

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Percent DRI for vitamin C	Frequency of sedentary activities	-.19	-.24	.01	7.95 (.0006)	.10 (n=123)
	Child's age	-.08	-.22	.01		

Table 7-61. Regression of parenting style on parental socioeconomic status, work-related stresses, and body mass index for female subjects

Variables of concern	Predictors	Beta	Standard beta	P value	LR χ^2 (p value)	Pseudo.R^2 (size of n)
1) Mother's authoritative style	Father's work spillover to family	-.64	-.31	.02	5.41 (.0201)	.05 (n=109)
2) Father's authoritative style	Family income	.28	.57	.00	22.64 (<.0001)	.21 (n=96)
	Parents' average BMI	-47.03	-.34	.02		
3) Both parents' authoritative style	Family income	.20	.40	.00	21.75 (<.0001)	.20 (n=96)
	Parents' average BMI	-61.64	-.45	.00		

Table 7-62. Regression of parenting style dimensions on parental socioeconomic status, work-related stresses, and body mass index for female subjects

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Father's nurturing	Family income	3.18	.25	.01	5.36 (.0063)	.08 (n=96)
	Father's BMI	-647.22	-.19	.05		
2) Father's control	Father's age – mother's age	-.02	-.23	.02	6.05 (.0155)	.04 (n=111)

Table 7-63. Regression of family meal behaviors on perception of parenting style for female subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Frequency of family breakfast	Both parents' authoritative style	.98	.27	.01	7.60 (.0001)	.16 (n=102)
	Family income	-.17	-.35	.00		
	Child's age	-.18	-.21	.02		
2) Frequency of family dinner	Father's authoritative style	.79	.28	.00	7.03 (.0013)	.09 (n=117)
	Parents' average age	-.07	-.25	.01		
3) Frequency of family dinner away from home	Father's authoritative style	.60	.22	.02	5.71 (.0185)	.04 (n=117)
	Both parents' authoritative style	.48	.19	.04	4.17 (.0435)	.03 (n=117)
4) Perception of family dinner ritual	Both parents' authoritative style	2.84	.22	.03	5.75 (.0011)	.12 (n=110)
	Parents' average age	-.34	-.25	.01		
	Parents' average BMI	-92.96	-.19	.05		
	Father's authoritative style	3.04	.22	.02	5.84 (.0010)	.12 (n=110)
	Parents' average age	-.35	-.26	.01		
	Parents' average BMI	-100.40	-.21	.03		

Table 7-63 Continued,

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
5) Lack of food pressure from parents	Mother's authoritative style	.47	.25	.01	7.42 (<.0001)	.21 (n=97)
	Family income	.06	.26	.01		
	Father's BMI	13.87	.24	.01		
	Child's activity level	-.46	-.26	.01		
	Both parents' authoritative style	.31	.20	.05	6.45 (.0001)	.19 (n=97)
	Family income	.06	.26	.01		
	Father's BMI	13.69	.24	.01		
	Child's activity level	-.48	-.28	.00		
6) Parents provide child's favorite foods	Mother's authoritative style	.34	.19	.04	4.33 (.0398)	.03 (n=117)

Table 7-64. Regression of family meal behaviors on perception of parenting style dimensions for female subjects with control variables

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Frequency of family lunch	Father's control	1.05	.19	.04	5.10 (.0076)	.07 (n=116)
	Parents' average age	-.07	-.20	.03		
2) Frequency of family dinner away from home	Father's control	.90	.22	.02	5.70 (.0044)	.08 (n=115)
	Father's nurturing	.006	.24	.01		
	Father's control	.92	.23	.01	5.47 (.0054)	.07 (n=115)
	Mother's nurturing	.05	.21	.02		
3) Perception of family dinner ritual	Mother's nurturing	.41	.35	.00	9.40 (<.0001)	.19(n=109)
	Parents' average age	-.29	-.22	.01		
	Parents' average BMI	-91.23	-.19	.03		
	Father's nurturing	.04	.31	.00	7.92 (<.0001)	.16 (n=109)
	Parents' average age	-.34	-.25	.01		
	Parents' average BMI	-92.36	-.19	.04		
4) Lack of food pressure from parents	Mother's nurturing	.04	.24	.01	7.53 (<.0001)	.22 (n=96)
	Family income	.06	.29	.00		
	Father's BMI	13.67	.24	.01		
	Child's activity level	-.46	-.27	.01		
	Father's nurturing	.004	.24	.02	6.81 (<.0001)	.20 (n=96)
	Family income	.06	.26	.01		
	Father's BMI	13.19	.23	.02		
	Child's activity level	-.48	-.28	.00		

Table 7-64. Continued,

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
5) Parents provide child's favorite foods	Mother's nurturing	.03	.18	.05	3.99 (.0483)	.03 (n=116)
6) Mother's criticism about child's eating	Father's control	.38	.18	.05	3.91 (.0504)	.02 (n=116)
7) Father's criticism about child's eating	Father's control	.40	.20	.03	4.30 (.0159)	.05 (n=116)
	Mother's age	.02	.18	.05		

Table 7-65. Regression of self-concept on perception of parenting style for female subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Self esteem	Both parents' authoritative style	111.39	.21	.03	5.09 (.0260)	.03 (n=117)
	Father's authoritative style	103.84	.18	.05	3.85 (.0523)	.02 (n=117)
2) Mother's concern for child overweight	Mother's authoritative style	-.10	-.26	.00	6.46 (.0005)	.13 (n=107)
	Maturity	.06	.18	.05		
	Parents' average BMI	2.05	.18	.05		
3) Father's concern for child overweight	Both parents' authoritative style	-.06	-.19	.05	5.51 (.0053)	.08 (n=111)
	Father's BMI	2.33	.21	.03		

Table 7-66. Regression of self-concept on perception of parenting style dimensions for female subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)/ LR χ^2 (p value**	**Adj. R^2 / Pseudo. R^2** (size of n)
1) Self esteem	Father's control	-262.33	-.30	.00	11.59 (.0009)	.08 (n=116)
	Father's nurturing	1.03	.18	.05	3.99 (.0482)	.03 (n=116)
2) Mother's concern for child overweight	Mother's nurturing	-.007	-.23	.01	6.54 (.0021)	.09 (n=110)
	Parents' average BMI	2.159	.19	.05		
	Mother's control	.126	.24	.01	6.79 (.0017)	.10 (n=111)
	Parents' average BMI	2.665	.23	.01		
3) Father's concern for child overweight	Father's control	.154	.28	.00	8.70 (.0003)	.12 (n=110)
	Father's BMI	2.649	.23	.01		
4) Self perception of weight gain	Mother's control	-2.23	-.35	.00	8.80 (.0030)	.07 (n=117)

Table 7-67. Regression of eating behaviors on perception of parenting style for female subjects with control variables

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (p value)	Pseudo. R^2 (size of n)
1) Frequency of snacking	Mother's authoritative style	.47	.19	.04	4.45 (.0371)	.03 (n=117)
2) Frequency of TV watching while eating dinner	Father's authoritative style	-.302	-.22	.01	6.21 (.0006)	.12 (n=117)
	Mother's education	-.010	-.19	.03		
	Activity level	-.238	-.17	.05		
	Both parents' authoritative style	-.27	-.21	.02	6.04 (.0007)	.12 (n=117)
	Mother's education	-.10	-.20	.03		
	Activity level	-.27	-.19	.03		

Table 7-68. Regression of physical activity behaviors on perception of parenting style dimensions for female subjects with control variables

Variables of concern	Predictors	Beta	Standard Beta	P value	LR χ^2 (P value)	Pseudo. R^2 (size of n)
1) Team sports participation	Mother's Nurturing	.084	.24	.05	17.05 (.0002)	.16 (n=101)
	Family income	.220	.47	.00		
	Father's nurturing	.012	.30	.03	18.55 (<.0001)	.17 (n=101)
	Family income	.197	.40	.00		

Table 7-69. Regression of energy and nutrient intake on perception of parenting style for female subjects with control variables

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Percent calorie from saturated fat	Father's authoritative style	-1.403	-.23	.01	6.65 (.0112)	.05 (n=117)
	Both parents' authoritative style	-1.077	-.19	.04	4.37 (.0388)	.03 (n=117)
2) Percent DRI for fiber	Mother's authoritative style	.208	.24	.01	6.80 (.0103)	.05 (n=117)
3) Total sugar	Father's authoritative style	.906	.20	.03	5.69 (.0012)	.11 (n=113)
	Mother's education	.345	.20	.03		
	Maturity	-.939	-.22	.01		

Table 7-70. Regression of energy and nutrient intake on perception of parenting style dimensions for female subjects with control variables

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Percent calorie from protein	Father's nurturing	-.001	-.22	.01	6.03 (.0008)	.12 (n=110)
	Father's age – Mother's age	.010	.19	.04		
	Mother's BMI	6.389	.21	.02		
2) Percent calorie from fat	Father's control	286.86	.26	.00	8.42 (.0044)	.06 (n=116)
3) Percent calorie from saturated fat	Father's control	2.631	.29	.00	10.81 (.0013)	.08 (n=116)
4) Saturated fat	Father's control	.764	.23	.01	6.63 (.0113)	.05 (n=116)

Table 7-71. Regression of self-concept on family meal behaviors and control variables for female subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Self esteem	Frequency of family dinner	48.71	.24	.01	7.17 (.0085)	.05 (n=117)
2) Mother's concern for child overweight	Perception of family dinner ritual	-.01	-.35	.00	11.45 (<.0001)	.15 (n=116)
	Parents provide child's favorite foods	-.04	-.20	.02		
3) Father's concern for child overweight	Perception of family dinner ritual	-.01	-.34	.00	11.87 (<.0001)	.16 (n=115)
	Parents provide child's favorite foods	-.05	-.24	.01		

Table 7-72. Regression of eating behaviors on family meal behaviors and control variables for female subjects

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**LR χ^2 (P value)**	**Pseudo. R^2** (size of n)
1) Frequency of skipping breakfast	Perception of family dinner ritual	-.07	-.27	.02	25.78 (<.0001)	.20 (n=116)
	Parents provide child's favorite foods	-.82	-.33	.00		
	Child's age	.27	.32	.00		
2) Frequency of snacking	Lack of food pressure from parents	.54	.23	.02	13.87 (.0010)	.11 (n=117)
	Father's criticism about child's eating	.88	.29	.00		
	Lack of food pressure from parents	.55	.24	.02	12.31 (.0021)	.10 (n=117)
	Mother's criticism about child's eating	.82	.29	.00		
3) TV watching while eating dinner	Perception of family dinner ritual	-.06	-.23	.03	26.01 (<.0001)	.20 (n=116)
	Father's criticism about child's eating	.92	.30	.01		
	Mother's education	-.50	-.34	.00		
	Child's activity level	-.99	-.25	.02		
4) Present dieting	Frequency of family breakfast	-.32	-.33	.02	9.03 (.0109)	.08 (n=112)
	Father's BMI	39.11	.31	.05		

Table 7-73. Regression of physical activity behaviors on family meal behaviors and control variables for female subjects

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**LR χ^2 (P value)**	**Pseudo. R^2** (size of n)
1) Frequency of sedentary activities	Parents provide child's favorite foods	-.67	-.27	.01	16.54 (.0003)	.14 (n=114)
	Mother's criticism about child's eating	.89	.32	.00		

Table 7-74. Regression of energy and nutrient intake on family meal behaviors and control variables for female subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Total calorie	Frequency of family lunch	.05	.35	.00	10.12 (<.0001)	.14 (n=112)
	Father's BMI	3.38	.18	.04		
2) Calorie per body weight	Frequency of family lunch	.09	.18	.01	44.09 (<.0001)	.43 (n=117)
	Child's age	-.24	-.61	.00		
3) Percent calorie from protein	Lack of food pressure from parents	-.05	-.20	.03	5.44 (.0055)	.07 (n=117)
	Child's age	.02	.22	.01		
4) Percent calorie from total fat	Frequency of family lunch	34.88	.18	.05	4.21 (.0172)	.05 (n=117)
	Father's criticism about child's eating	114.65	.20	.03		
5) Percent DRI for calcium	Mother's criticism about child's eating	.55	.22	.02	4.91 (.0090)	.06 (n=117)
	Child's age	-.15	-.20	.03		
6) Percent DRI for iron	Frequency of family lunch	.43	.27	.00	6.76 (.0017)	.09 (n=117)
	Mother's education	.40	.18	.05		
7) Percent DRI for dietary fiber	Frequency of family dinner away from home	-.09	-.31	.00	6.75 (.0003)	.13 (n=117)
	Frequency of family lunch	.05	.24	.01		
	Mother's education	.06	.21	.02		

Table 7-74 Continued,

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
8) Sodium	Frequency of family lunch	.06	.30	.00	8.61 (.0003)	.12 (n=111)
	Parent's average BMI	5.91	.21	.02		
9) Cholesterol	Frequency of family lunch	.36	.18	.05	4.01 (.0476)	.03 (n=117)
10) Saturated fat	Frequency of family lunch	.18	.31	.00	7.89 (.0006)	.11 (n=112)
	Father's BMI	12.37	.18	.05		
11) Trans fat	Lack of food pressure from parents	.12	.19	.04	4.60 (.0045)	.09 (n=117)
	Father's criticism about child's eating	-.17	-.20	.03		
	Child's age	-.04	-.18	.04		

Table 7-75. Regression of physical outcomes on family meal behaviors with control variables for female subjects

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Triceps skinfold	Parents provide child's favorite foods	-.10	-.21	.02	8.33 (<.0001)	.17 (n=111)
	Parents' average BMI	7.25	.27	.00		

Table 7-76. Regression of energy and nutrient intake on eating behaviors and control variables for female subjects

Variables of concern	**Predictors**	**Beta**	**Standard Beta**	**P value**	**F value (p value)**	**Adj. R^2** (size of n)
1) Total calorie	Frequency of skipping breakfast	-.09	-.22	.02	4.77 (.0103)	.06 (n=112)
	Parents' average BMI	3.77	.20	.03		
2) Calorie per body weight	Frequency of skipping breakfast	-.29	-.22	.00	34.75 (<.0001)	.47 (n=116)
	Child's age	-.23	-.57	.00		
	Mother's BMI	-16.70	-.14	.04		
3) Percent calorie from carbohydrates	Frequency of skipping breakfast	-2.06	-.20	.03	5.02 (.0270)	.03 (n=117)
4) Percent calorie from protein	Frequency of snacking	-.07	-.30	.00	7.42 (<.0001)	.18 (n=116)
	TV watching while eating dinner	.06	.18	.04		
	Child's age	.02	.19	.03		
	Mother's BMI	5.58	.19	.03		
5) Percent calorie from fat	Frequency of skipping breakfast	98.23	.19	.04	4.88 (.0092)	.06 (n=116)
	Frequency of food supplements intake	-79.68	-.18	.05		
6) Percent DRI for calcium	Frequency of skipping breakfast	-.86	-.34	.00	11.21 (<.0001)	.15 (n=117)
	Mother's education	.25	.18	.04		

Table 7-76 Continued,

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
7) Percent DRI for iron	Frequency of skipping breakfast	-1.00	-.24	.00	26.33 (<.0001)	.40 (n=117)
	Child's age	-.62	-.50	.00		
	Mother's education	.42	.19	.01		
8) Percent DRI for vitamin A	Frequency of skipping breakfast	-1.74	-.18	.04	5.75 (.0042)	.08 (n=117)
	Parents' average education	1.42	.24	.01		
9) Percent DRI for folate	Frequency of skipping breakfast	-1.07	-.28	.00	18.06 (<.0001)	.23 (n=117)
	Child's age	-.36	-.32	.00		
10) Percent DRI for fiber	Frequency of skipping breakfast	-.16	-.29	.00	10.68 (.0014)	.08 (n=117)
11) Total sugar	Frequency of skipping breakfast	-.67	-.20	.03	7.32 (<.0001)	.20 (n=102)
	Frequency of snacking	.59	.28	.00		
	Family income	.11	.19	.04		
	White race	.94	.18	.05		
12) Sodium	Frequency of food supplements intake	-.09	-.19	.05	4.93 (.0089)	.07 (n=110)
	Parents' average BMI	5.21	.19	.05		
13) Cholesterol	TV watching while eating dinner	1.28	.24	.01	6.90 (.0098)	.05 (n=117)
14) Saturated fat	Frequency of food supplements intake	-.26	-.20	.03	4.89 (.0229)	.03 (n=116)

Table 7-77. Regression of physical outcomes on eating behaviors and control variables for female subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Weight	Frequency of skipping breakfast	.08	.16	.01	46.04 (<.0001)	.62 (n=111)
	Present dieting	.14	.16	.01		
	Child's age	.09	.62	.00		
	Parents' average BMI	5.72	.24	.00		
2) BMI	Frequency of skipping breakfast	.003	.18	.02	22.03 (<.0001)	.43 (n=111)
	Present dieting	.01	.25	.00		
	Child's age	.002	.36	.00		
	Parents' average BMI	.23	.32	.00		
3) BMI –z score	Frequency of skipping breakfast	.26	.18	.03	14.47 (<.0001)	.27 (n=111)
	Present dieting	.74	.28	.00		
	Parents' average BMI	25.00	.35	.00		
4) Triceps skinfold	Present dieting	.37	.36	.00	13.50 (<.0001)	.25 (n=111)
	Parents' average BMI	7.28	.27	.00		
	Child's activity level	-.17	-.22	.01		
5) Subscapular skinfold	Present dieting	.07	.31	.00	16.63 (<.0001)	.30 (n=111)
	Child's age	.01	.27	.00		
	Parents' average BMI	1.76	.31	.00		

Table 7-77 Continued,

Variables of concern	**Predictors**	**Beta**	**Standard beta**	**P value**	**F value (p value)/ LR χ^2 (p value)**	**Adj. R^2 / Pseudo R^2** (size of n)
6) Waist	Frequency of skipping breakfast	.06	.24	.01	14.21 (<.0001)	.32 (n=112)
	Present dieting	.12	.26	.00		
	Child's age	.02	.29	.00		
	Parents' average BMI	1.94	.17	.03		
7) Normal weight	Present dieting	-1.98	-.39	.00	29.63 (<.0001)	.23 (n=111)
	Parents' average BMI	-79.36	-.58	.00		
8) At risk of overweight	Present dieting	1.35	.26	.02	12.09 (.0024)	.10 (n=111)
	Parents' average BMI	47.50	.35	.01		
9) Overweight	Frequency of skipping breakfast	.96	.35	.03	12.73 (.0017)	.11 (n=111)
	Parents' average BMI	65.86	.48	.01		
10) Above normal weight	Present dieting	1.98	.39	.00	29.63 (<.0001)	.23 (n=111)
	Parents' average BMI	79.36	.58	.00		

Table 7-78. Regression of energy and nutrient intake on physical activity behaviors and control variables for female subjects

Variables of concern	Predictors	Beta	Standard Beta	P value	F value (p value)	Adj. R^2 (size of n)
1) Calorie per body weight	Frequency of sedentary activities	-.14	-.15	.05	40.23 (<.0001)	.41 (n=114)
	Child's age	-.25	-.62	.00		
2) Percent calorie from carbohydrates	Frequency of sedentary activities	-.03	-.24	.01	6.15 (.0031)	.09 (n=100)
	Family income	.01	.26	.01		
3) Percent calorie from protein	Team sport participation	-.09	-.20	.03	5.58 (.0049)	.07 (n=117)
	Child's age	.02	.21	.02		
4) Cholesterol	Regular exercise	-1.34	-.18	.05	3.92 (.0500)	.02 (n=117)

Table 7-79. Regression of physical outcomes on physical activity behaviors and control variables for female subjects

Variables of concern	Predictors	Beta	Standard beta	P value	F value (p value)/ LR χ^2 (p value)	Adj. R^2 / Pseudo R^2 (size of n)
1) Weight	Frequency of sedentary activities	.05	.14	.03	50.11 (<.0001)	.58 (n=108)
	Child's age	.10	.68	.00		
	Parents' average BMI	6.37	.27	.00		
2) Triceps skinfold	Regular exercise	-.20	-.25	.01	9.32 (.0002)	.13 (n=111)
	Parents' average BMI	8.33	.30	.00		
3) Overweight	Frequency of hard exercise	-1.35	-.55	.01	15.57 (.0004)	.13 (n=111)
	Parents' average BMI	61.80	.45	.01		

APPENDIX F

PATH ANALYSIS

- FIGURES 7-1 TO 7-19 AND TABLES 7-80 TO 7-89

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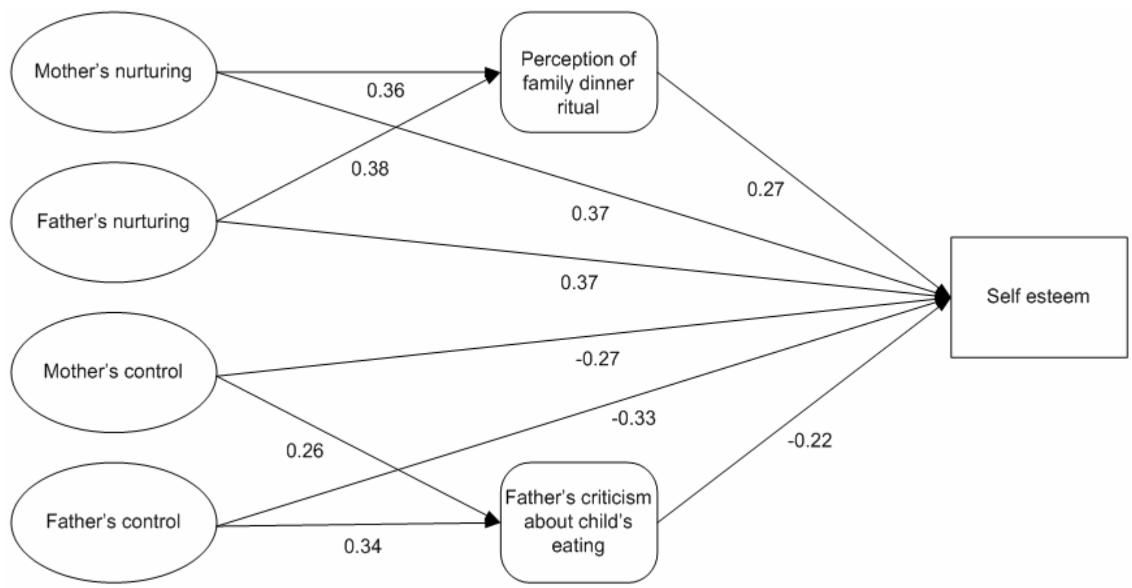

Figure 7-1. Path diagram for relationship between parenting style dimensions and children's self-esteem via perception of family dinner ritual and father's criticism about child' eating

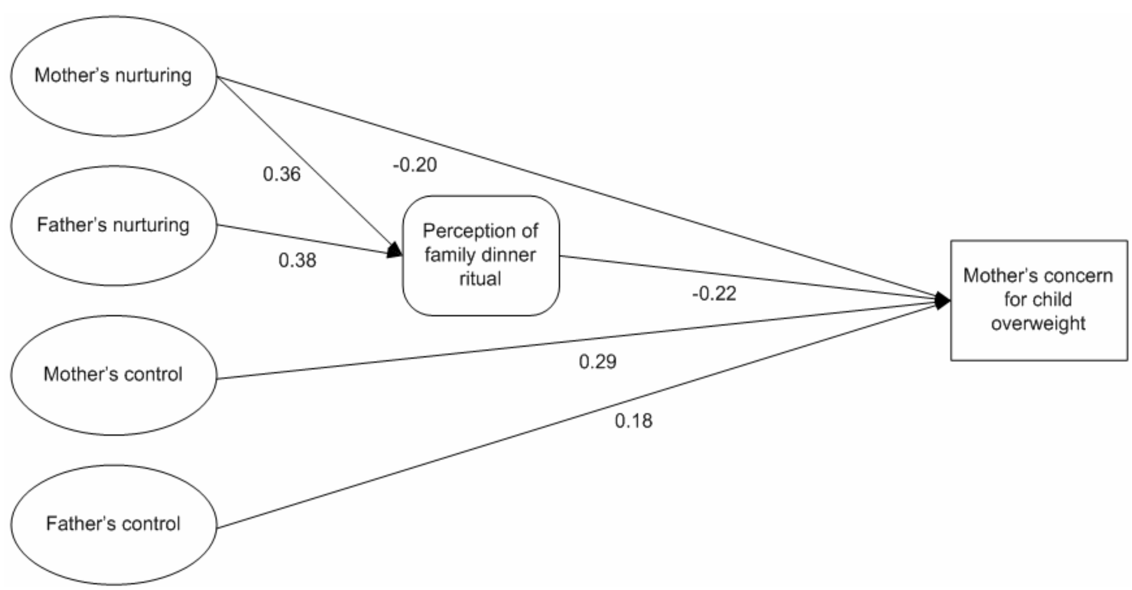

Figure 7-2. Path diagram for relationship between parenting style dimensions and children's perception of mother's concern for child overweight via perception of family dinner ritual

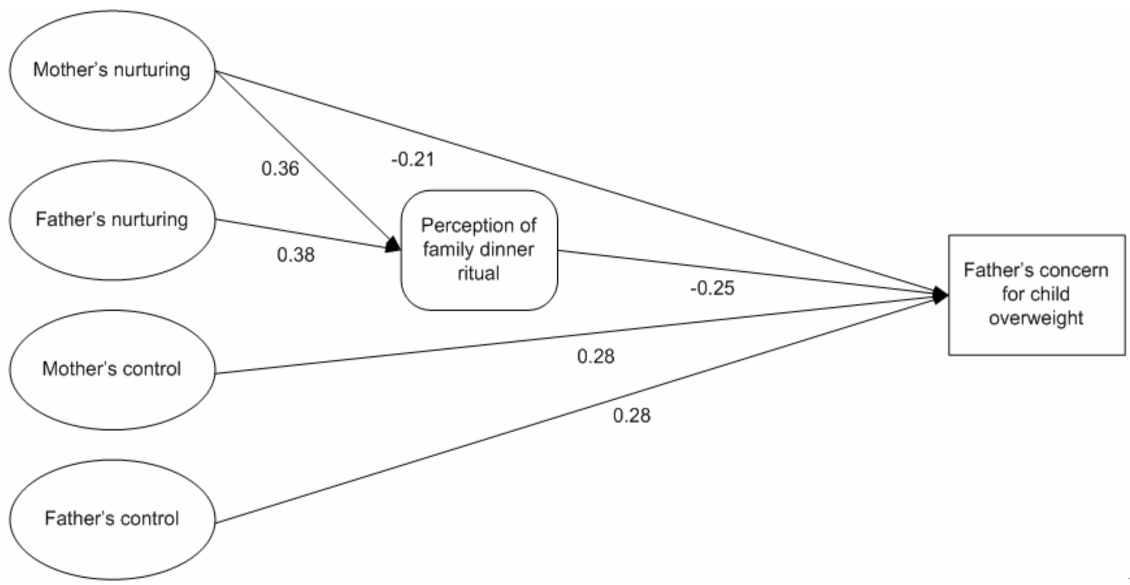

Figure 7-3. Path diagram for relationship between parenting style dimensions and children's perception of father's concern for child overweight via perception of family dinner ritual

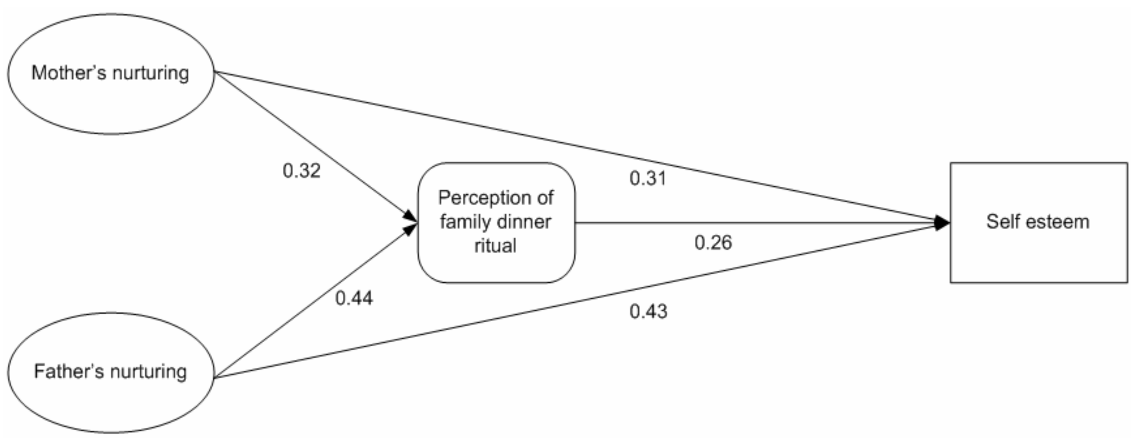

Figure 7-4. Path diagram for relationship between parenting style dimensions and male subjects' self esteem via perception of family dinner ritual

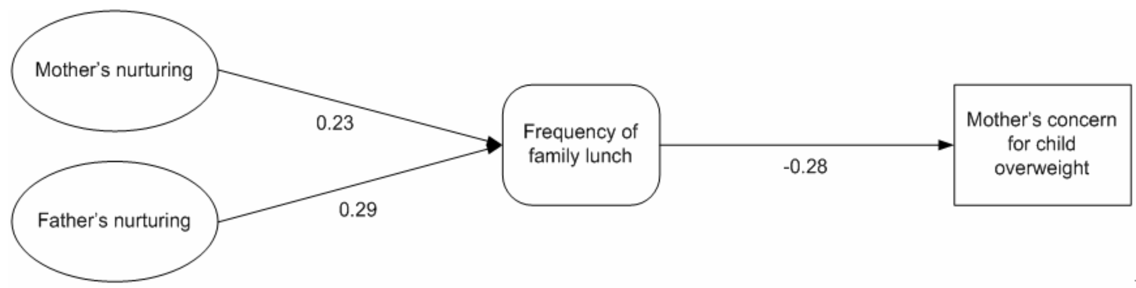

Figure 7-5. Path diagram for relationship between parenting style dimensions and male subjects' perception of mother's concern for child overweight via frequency of family lunch

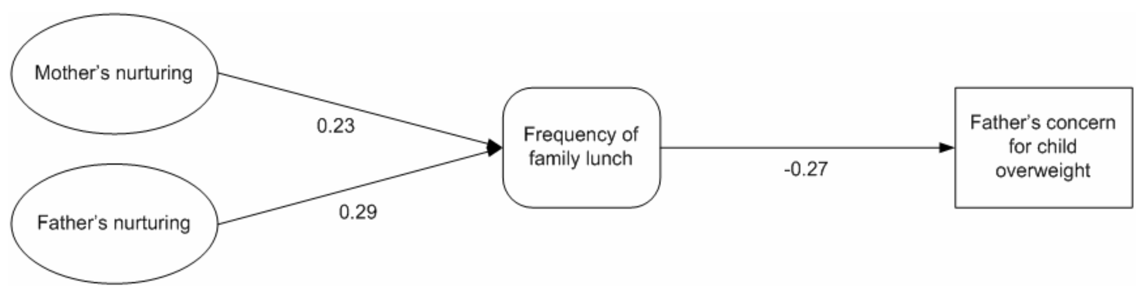

Figure 7-6. Path diagram for relationship between parenting style dimensions and male subjects' perception of father's concern for child overweight via frequency of family lunch

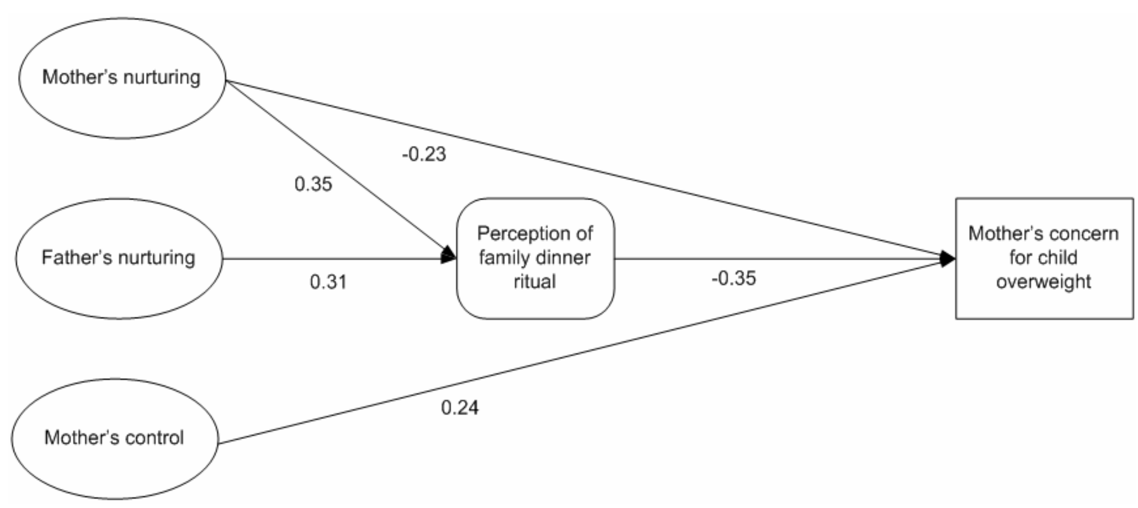

Figure 7-7. Path diagram for relationship between parenting style dimensions and female subjects' perception of mother's concern for child overweight via perception of family dinner ritual

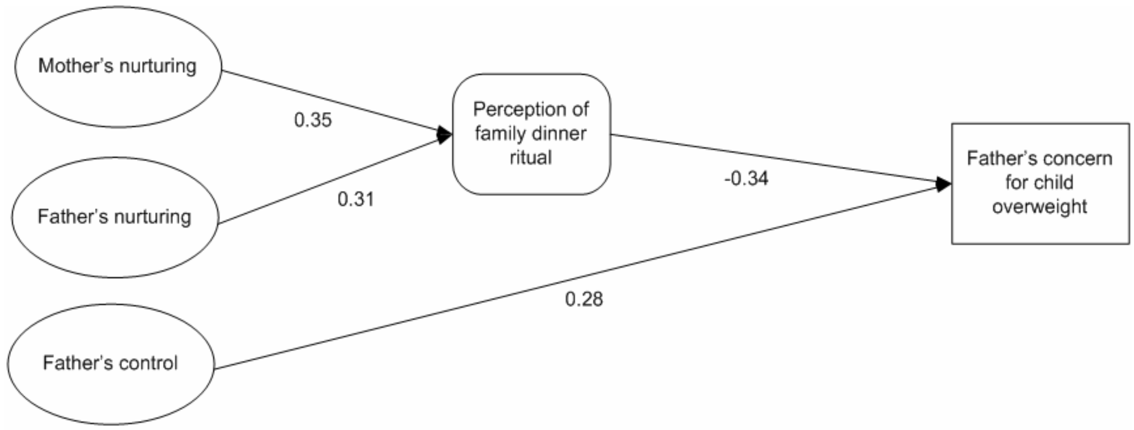

Figure 7-8. Path diagram for relationship between parenting style dimensions and female subjects' perception of father's concern for child overweight via perception of family dinner ritual

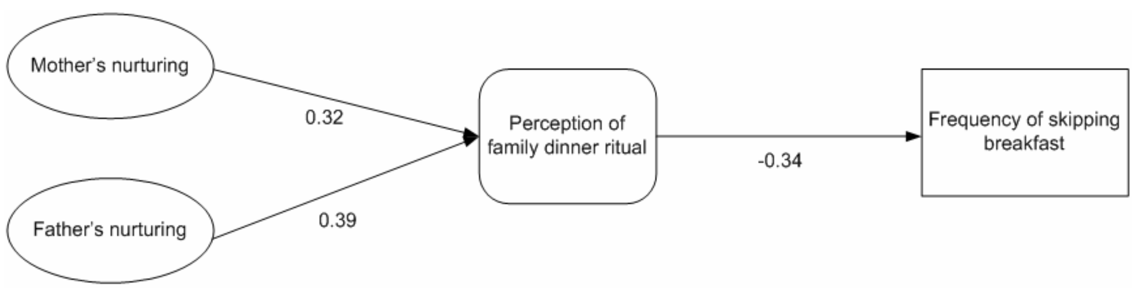

Figure 7-9. Path diagram for relationship between parenting style dimensions and adolescents' frequency of skipping breakfast via perception of family dinner ritual

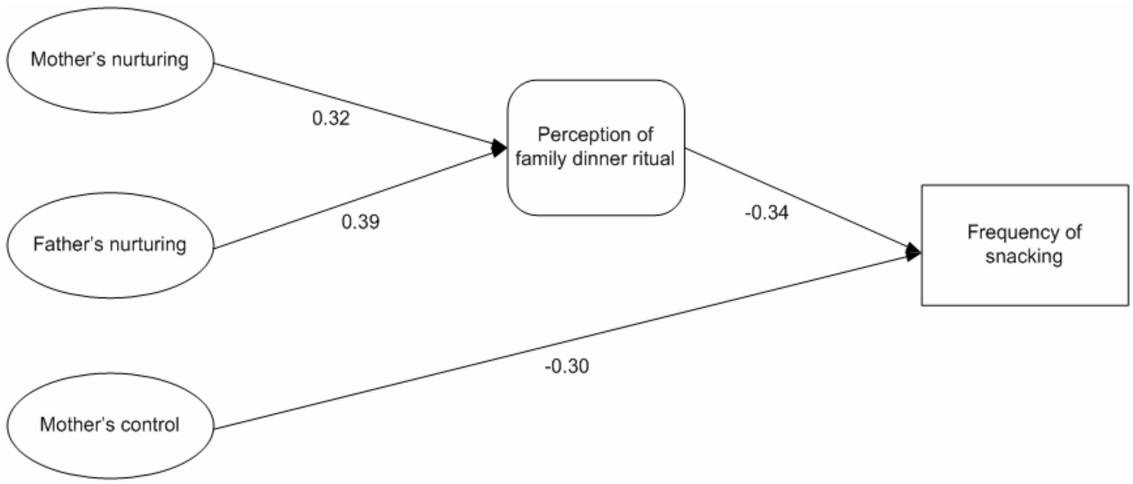

Figure 7-10. Path diagram for relationship between parenting style dimensions and adolescents' frequency of snacking via perception of family dinner ritual

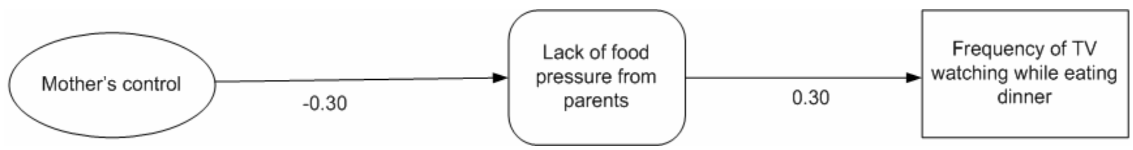

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Figure 7-12. Path diagram for relationship between parenting style dimensions and male subjects' frequency of skipping breakfast via lack of food pressure from parents

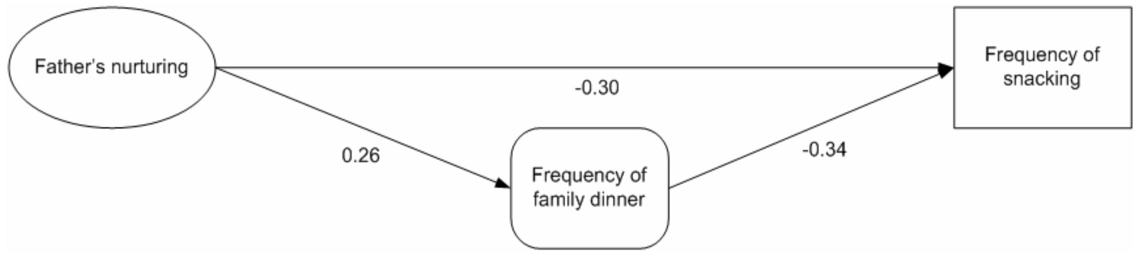

Figure 7-13. Path diagram for relationship between parenting style dimensions and male subjects' frequency of snacking via frequency of family dinner

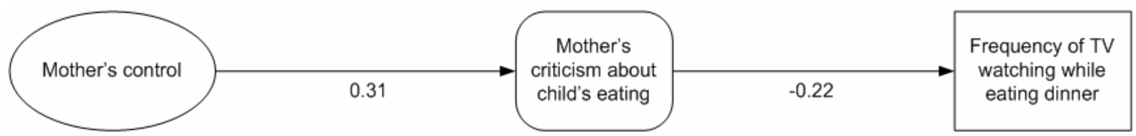

Figure 7-14. Path diagram for relationship between parenting style dimensions and male subjects' frequency of TV watching while eating dinner via mother's criticism about child's eating

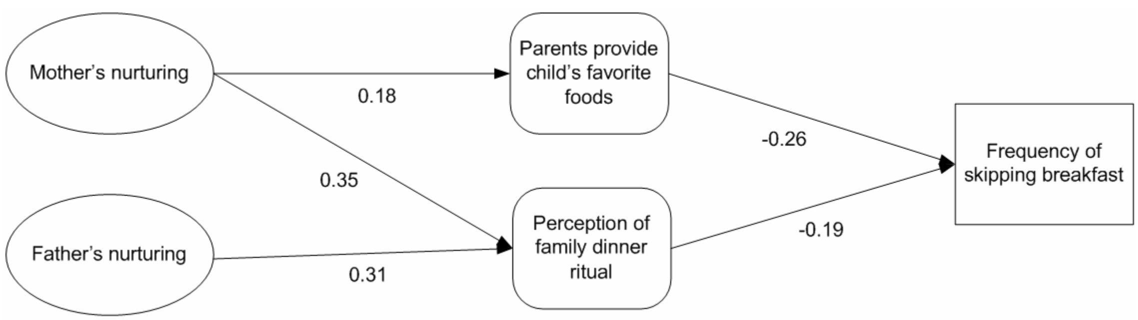

Figure 7-15. Path diagram for relationship between parenting style dimensions and female subjects' frequency of skipping breakfast via perception of family dinner ritual or parents provide child's favorite foods

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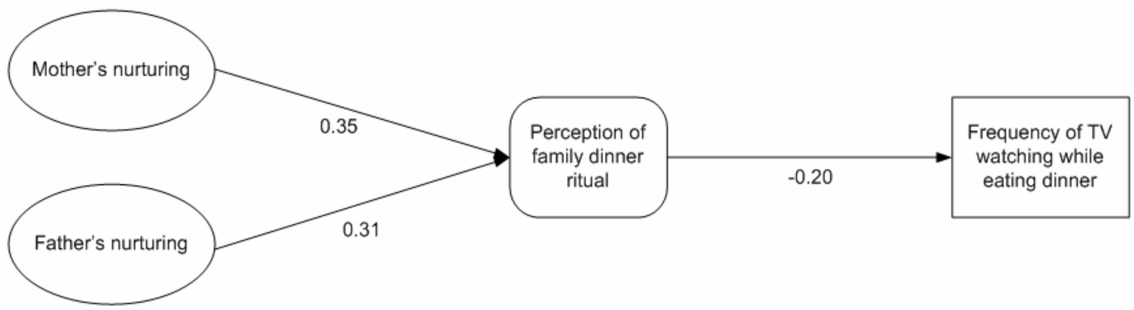

Figure 7-17. Path diagram for relationship between parenting style dimensions and female subjects' frequency of TV watching while eating dinner via perception of family dinner ritual

Figure 7-18. Path diagram for relationship between parenting style dimensions and adolescent' frequency of sedentary activities via parents provide child's favorite foods

Figure 7-19. Path diagram for relationship between parenting style dimensions and female subjects' frequency of sedentary activities via parents provide child's favorite foods

Table 7-80. Summary of causal effects of parenting behaviors on children versus adolescents' self- concept w/wo mediation of family meal behaivors

Outcomes	Determinants	Mediators	Path Coefficients		
			Direct	Indirect	Total
Children's self concepts					
Self esteem	Mother's nurturing	Perception of family dinner ritual	0.37	0.10	0.47
	Father's nurturing	Perception of family dinner ritual	0.37	0.10	0.47
	Mother's control	Father's criticism about child's eating	-0.27	-0.06	-0.33
	Father's control	Father's criticism about child's eating	-0.33	-0.07	-0.40
Mother's concern for child overweight	Mother's nurturing	Perception of family dinner ritual	-0.20	-0.08	-0.28
	Father's nurturing	Perception of family dinner ritual		-0.08	-0.08
	Mother's control		0.29		0.29
	Father's control		0.18		0.18
Father's concern for child overweight	Mother's nurturing	Perception of family dinner ritual	-0.21	-0.09	-0.30
	Father's nurturing	Perception of family dinner ritual		-0.10	-0.10
	Mother's control		0.28		0.28
	Father's control		0.28		0.28
Adolescents' self concepts					
Self esteem	Father's nurturing		0.27		0.27
Mother's concern for child overweight	Father's nurturing		-0.21		-0.21

Both direct and indirect coefficients were obtained statistical significance at $P<.05$. Total path coefficients designate the summation of direct and indirect effects when applied.

Table 7-81. Summary of causal effects of parenting behaviors on children versus adolescents' eating behaviors w/wo mediation of family meal behaivors

Outcomes	Determinants	Mediators	Path Coefficients		
			Direct	Indirect	Total
Children's eating behaviors					
		No direct or indirect effect			
Adolescents' eating behaviors					
Frequency of skipping breakfast	Mother's nurturing	Perception of family dinner ritual		-0.11	-0.11
	Father's nurturing	Perception of family dinner ritual		-0.13	-0.13
Frequency of snacking	Mother's nurturing	Perception of family dinner ritual		-0.10	-0.10
	Father's nurturing	Perception of family dinner ritual		-0.12	-0.12
	Mother's control		-0.30		-0.30
Frequency of TV watching while eating dinner	Mother's control	Lack of food pressure from parents		-0.09	-0.09

Both direct and indirect coefficients were obtained statistical significance at P<.05. Total path coefficients designate the summation of direct and indirect effects when applied.

Table 7-82. Summary of causal effects of parenting behaviors on children versus adolescents' physical activity behaviors w/wo mediation of family meal behaivors

Outcomes	Determinants	Mediators	Path Coefficients		
			Direct	Indirect	Total
Children's physical activity behaviors					
Frequency of sedentary activities		No direct and indirect effect			
Adolescents' physical activity behaviors					
Frequency of hard exercise	Father's nurturing	Frequency of family lunch	0.22		0.22
Frequency of sedentary activities	Mother's nurturing	Parents provide child's favorite foods		0.07	0.07

Both direct and indirect coefficients were obtained statistical significance at P<.05. Total path coefficients designate the summation of direct and indirect effects when applied.

Table 7-83. Predicted effects of parenting style dimensions on children's self-concept, eating behaviors, and physical activity behaviors w/wo mediation of family meal behaviors

	Self-concept			**Eating behavior**			**Physical activity behaviors**		
	Self-esteem	**Mother's concern for child's overweight**	**Father's concern for child's overweight**	**Frequency of skipping breakfastSkip Breakfast**	**Frequency of snacking**	**Frequency of TV watching while eating dinner**	**Frequency of hard exercise**	**Frequency of light exercise**	**Frequency of sedentary activities**
MN	0.47^{B}	-0.28^{B}	-0.30^{B}	N/A	N/A	N/A	N/A	N/A	N/A
FN	0.47^{B}	-0.08^{I}	-0.10^{I}	N/A	N/A	N/A	N/A	N/A	N/A
MC	-0.33^{B}	0.29^{D}	0.28^{D}	N/A	N/A	N/A	N/A	N/A	N/A
FC	-0.40^{B}	0.18^{D}	0.28^{D}	N/A	N/A	N/A	N/A	N/A	N/A

MN: mother's nurturing, FN: father's nurturing, MC: mother's control, FC: father's control, B: value was created by summation of direct and indirect effects, D: direct effect, I: indirect effect

Table 7-84. Predicted effects of parenting style dimensions on adolescents' self-concept, eating behaviors, and physical activity behaviors w/wo mediation of family meal behaviors

	Self-concept			Eating behavior			Physical activity behaviors		
	Self-esteem	**Mother's concern about child's overweight**	**Father's concern about child's overweight**	**Frequency of skipping breakfastSkip Breakfast**	**Frequency of snacking**	**Frequency of TV watching while eating dinner**	**Frequency of hard exercise**	**Frequency of light exercise**	**Frequency of sedentary activities**
MN	N/A	N/A	N/A	-0.11^{I}	-0.10^{I}	N/A	N/A	N/A	0.07^{I}
FN	0.27^{D}	-0.21^{D}	N/A	-0.13^{I}	-0.12^{I}	N/A	0.22^{D}	N/A	N/A
MC	N/A	N/A	N/A	N/A	-0.30^{D}	-0.09^{I}	N/A	N/A	N/A
FC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

MN: mother's nurturing, FN: father's nurturing, MC: mother's control, FC: father's control, B: value was created by summation of direct and indirect effects, D: direct effect, I: indirect effect

Table 7-85. Summary of causal effects of parenting behaviors on male versus female subjects' self-concept w/wo mediation of family meal behaviors

Outcomes	Determinants	Mediators	Path Coefficients		
			Direct	**Indirect**	**Total**
Males' self concepts					
Self esteem	Mother's nurturing	Perception of family dinner ritual	0.31	0.08	0.39
	Father's nurturing	Perception of family dinner ritual	0.43	0.11	0.54
Mother's concern for child overweight	Mother's nurturing	Frequency of family lunch		-0.06	-0.06
	Father's nurturing	Frequency of family lunch		-0.08	-0.08
Father's concern for child overweight	Mother's nurturing	Frequency of family lunch		-0.06	-0.06
	Father's nurturing	Frequency of family lunch		-0.08	-0.08
Females' self concepts					
Self esteem	Father's nurturing		0.18		0.18
	Father's control		-0.30		-0.30
Mother's concern for child overweight	Mother's nurturing	Perception of family dinner ritual	-0.23	-0.12	-0.35
	Father's nurturing	Perception of family dinner ritual		-0.11	-0.11
	Mother's control		0.24		0.24
Father's concern for child overweight	Mother's nurturing	Perception of family dinner ritual		-0.12	-0.12
	Father's nurturing	Perception of family dinner ritual		-0.11	-0.11
	Father's control		0.28		0.28

Both direct and indirect coefficients were obtained statistical significance at $P<.05$. Total path coefficients designate the summation of direct and indirect effects when applied.

Table 7-86. Summary of causal effects of parenting behaviors on male versus female subjects' eating behaviors w/wo mediation of family meal behaviors

Outcomes	Determinants	Mediators	Path Coefficients		
			Direct	Indirect	Total
Males' eating behaviors					
Frequency of skipping breakfast	Mother's control	Lack of food pressure from parents		-0.05	-0.05
Frequency of snacking	Father's nurturing	Frequency of family dinner	-0.30	-0.09	-0.39
Frequency of TV watching over dinner	Mother's control	Mother's criticism about child's eating		-0.07	-0.07
Females' eating behaviors					
Frequency of skipping breakfast	Mother's nurturing	Perception of family dinner ritual		-0.07	-0.07
		Parents provide child's favorite foods		-0.05	-0.05
	Father's nurturing	Perception of family dinner ritual		-0.06	-0.06
Frequency of snacking	Mother's nurturing	Lack of food pressure from parents		0.05	0.05
Frequency of TV watching while eating dinner	Mother's nurturing	Perception of family dinner ritual		-0.08	-0.08
	Father's nurturing	Perception of family dinner ritual		-0.06	-0.06

Both direct and indirect coefficients were obtained statistical significance at P<.05. Total path coefficients designate the summation of direct and indirect effects when applied.

Table 7-87. Summary of causal effects of parenting behaviors on male versus female subjects' physical activity behaviors w/wo mediation of family meal behaviors

Outcomes	Determinants	Mediators	Path Coefficients		
			Direct	Indirect	Total
Males' physical activity behaviors					
Frequency of sedentary activities	Mother's nurturing		0.31		0.31
	Father's nurturing		0.20		0.20
Females' physical activity behaviors					
Frequency of sedentary activities	Mother's nurturing	Parents provide child's favorite foods		-0.05	-0.05

Both direct and indirect coefficients were obtained statistical significance at P<.05. Total path coefficients designate the summation of direct and indirect effects when applied.

Table 7-88. Predicted effects of parenting style dimensios on male subjects' self-concept, eating behaviors, and physical activity behaviors w/wo mediation of family meal behaviors

	Self-concept			**Eating behavior**			**Physical activity behaviors**		
	Self-esteem	**Mother's concern about child's overweight**	**Father's concern about child's overweight**	**Frequency of skipping breakfastSkip Breakfast**	**Frequency of snacking**	**Frequency of TV watching while eating dinner**	**Frequency of hard exercise**	**Frequency of light exercise**	**Frequency of sedentary activities**
MN	0.39^{B}	-0.06^{I}	-0.06^{I}	N/A	N/A	N/A	N/A	N/A	0.31^{D}
FN	0.54^{B}	-0.08^{I}	-0.08^{I}	N/A	-0.39^{B}	N/A	N/A	N/A	0.20^{D}
MC	N/A	N/A	N/A	-0.05^{I}	N/A	-0.07^{I}	N/A	N/A	N/A
FC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

MN: mother's nurturing, FN: father's nurturing, MC: mother's control, FC: father's control, B: value was created by summation of direct and indirect effects, D: direct effect, I: indirect effect

Table 7-89. Predicted effects of parenting style dimensios on female subjects' self-concept, eating behaviors, and physical activity behaviors w/wo mediation of family meal behaviors

	Self-concept			**Eating behavior**			**Physical activity behaviors**		
	Self-esteem	**Mother's concern about child's overweight**	**Father's concern about child's overweight**	**Frequency of skipping breakfastSkip Breakfast**	**Frequency of snacking**	**Frequency of TV watching while eating dinner**	**Frequency of hard exercise**	**Frequency of light exercise**	**Frequency of sedentary activities**
MN	N/A	-0.35^{B}	-0.12^{I}	-0.12^{I}	0.05^{I}	-0.08^{I}	N/A	N/A	-0.05^{I}
FN	0.18^{D}	-0.11^{I}	-0.11^{I}	-0.06^{I}	N/A	-0.06^{I}	N/A	N/A	N/A
MC	N/A	0.24^{D}	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FC	-0.30^{D}	N/A	0.28^{D}	N/A	N/A	N/A	N/A	N/A	N/A

MN: mother's nurturing, FN: father's nurturing, MC: mother's control, FC: father's control, B: value was created by summation of direct and indirect effects, D: direct effect, I: indirect effect

APPENDIX G

CONSENT AND ASSENT FORMS

Subject's initials: ____________   Date: ______________________

CONSENT FORM AND INFORMATION

"PARENTAL TIME, ROLE STRAINS, COPING, AND CHILDREN'S DIET AND NUTRITION"
Texas A & M University, College Station, TX 77843-2125

I. Nature and Purpose
I have been asked for my permission for my participation and my child's participation in a research study which is being conducted by the Department of Rural Sociology at Texas A&M in the Houston area. I have been told that the purpose of this study is to examine the relationship between children's eating habits and body size and parental time constraints and parenting styles. I have been told that 300 children and their parents will participate in this study.

II. Procedure
I understand that if I allow my child to take part in this study, she or he will be interviewed in my home by means of a questionnaire. This will take about from 40 minutes to complete. The questions my child will be asked include questions regarding my child's activities during the last 24 hours, my child's perceptions of how family decisions are made, my child's perceptions of the closeness of our relationship is, my child's perceptions of how I usually punish my child, and my child's health habits such as how many hours of sleep per night the child gets on average, how my child feels about himself/herself, whether or nor my child smokes cigarettes, and whether or not my child drinks alcohol. Questions regarding smoking and drinking are sensitive in nature and my child has the right to refuse to answer these and any other questions on the questionnaire. If my child chooses to answer questions about smoking and drinking, I understand that these answers will be kept in confidence by the researchers. I will not have access to these answers. Another part of the questions will ask my child about his/her activities over the past 24 hours as well as what he/she ate during this same time period. In addition, my child will undergo a very brief physical exam that involves measuring height, weight, and skinfold thicknesses. This part of the study will be done after my child has been interviewed. I also understand that I will be asked to participate in a 25-minute telephone interview at a time of my choosing. I have been told that the interview deals with time constraints that may affect my family, my attitudes about child rearing, family employment in the labor force, family eating habits, my knowledge of nutrition, and my health history. I have been assured that my responses to these questions will remain confidential and that I have the right to refuse to answer any of the questions asked of me. Three hundred children and their parents will be asked to participate in this study.

III. Benefits
I have been told that the researchers will make available an assessment of my child's dietary intake and weight status. If this information indicates that my child is at risk of an eating disorder, I will be informed of this. In addition, in return for participating my child will be paid $25 and I will be paid $20 for my participation. In addition, the information provided to

Subject's initials: _____________ Date: _______________________

my child and I will aid researchers and health teachers to better understand ways to improve children's knowledge of nutrition and eating habits.

IV. Risks and Financial Responsibility
I have been told that there are no known risks to participating in this study. In the unforeseen event of injury resulting from participating in this study, I understand that there will be no financial compensation or free medical treatment offered by Texas A&M University. I have also been told that if evidence of child abuse is discovered either during the physical exam or survey interview, the researchers are obligated to report this to the proper authorities.

V. Confidentiality
I understand that most everything learned about my child in this study will be confidential. I have been told that I will receive a summary of my child's eating practices and weight status. If results from this study are published, I have been told that my child will not be identified in any way. I understand that the data collected by this project will be maintained by use of an identification number and not by my child's name nor by my name.

VI. Voluntary Participation
By signing this form, I understand that I am giving permission for my child's participation in the research project described above and that I am agreeing to participate myself. I understand that my decision to participate and my decision to allow my child to participate are both voluntary. Both my child and I are free to choose not to participate or to stop participation at any time. Refusal to participate will also have no negative effects on my child or me. I understand that in order for my child to be paid for his/her participation, he or she must complete the project. Similarly, I understand that in order for me to be paid, I must complete my part of the project. I have been told that there are no anticipated circumstances under which me or my child's participation may be terminated without my consent. I understand that if we agree to participate, that I must sign this consent form and my child the assent form and then mail both back to Texas A&M University in the enclosed envelope.

VII. Contact
If I have additional questions or concerns, I can contact William Alex McIntosh, Ph.D. at (979)845-8525 His address is Department of Rural Sociology, 2125 TAMU, Texas A& M University, College Station, TX 77843-2125. "This research study has been reviewed and approved by the Institutional Review Board Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, the Institutional Review Board may be contacted through Dr. Richard E. Miller, IRB Coordinator, Office of Vice President for Research and Associate Provost for Graduate Studies at (979) 845-8069.

VIII. Signature
The protocol and consent forms have been discussed with me. I have read and understand the explanation provided me. I have had all my questions answered to my satisfaction and I voluntarily agree for my child to participate in this study. I understand the risks and benefits

associated with participation in this project. I have also been given a copy of this consent form.

Signature of Subject	Signature of Witness	Date:
Name of Subject (Please Print)	Signature of Investigator	Date:

Please give the following information:

Address: ____________________________________

____

Phone: ____________________________________

Principal Investigator:
William Alex McIntosh
Department of Rural Sociology, 2125 TAMU
Texas A&M University, College Station, TX 77843
Phone: 979-845-8525

Conditions of Payment

Subjects will be mailed money orders in the amount promised them ($25 for children; $20 for each parent) after they have completed their portion of the project. Should one family member complete participation, but the other family members fail to do, that participating family member will still receive his or her compensation.

ASSENT FORM AND INFORMATION ABOUT "Parental Time, Role Strains, Coping, and Children's Diet and Nutrition"
Texas A&M University, College Station, TX 77843-2125

I have been told that the purpose of the study is to find out about children's eating habits and body size, family time pressures, and how my parents and I get along. Three hundred children and their parents will be asked to participate. I understand that if I agree to participate, I will be asked questions about the kind of relationships I have with my parents and how my parents punish me. I will also be asked I feel about myself. And I will be asked about my eating habits and how much I exercise. I understand that I will be asked about whether I smoke or drink and that I have the right to refuse to answer these or any other questions on the questionnaire. I will answer these questions during an interview in my home. I also understand that my height, weight, and several skinfold thicknesses will measured after I have been interviewed. I have been shown what these procedures entail. I have been told that my parents will also be asked to participate in this study. They will be asked some questions about their attitudes about child rearing, about their jobs, family eating habits, their knowledge of nutrition, and their health history.

I understand that my parents have to give their permission for me to participate in this study. I may participate only if they give their permission, but I also have the right to refuse to participate even if they have given their OK. If I change my mind, a can stop the interview or examination at any time. Nothing will happen to me if I decide not to participate in the study.

I understand that if I decide to participate, it may help researchers learn more about children's eating habits and how to make them better. If I participate, I have been told that I will not be hurt or harmed in any way by participating in this study. I have been told that I will get $25 after I have completed the study. I have also been told that 300 hundred children and their parents will be asked to participate in the study.

I understand that most of information I give the researchers will be kept private and confidential. I have been told that the researchers will provide my parents with a summary of my eating habits and my weight status; if the researchers think that I may have an eating disorder or am obese, my parents will be informed of this possibility. None of the rest of the information about me will be available to my parents. I have been asked to talk with my parents about participating. If they agree to participate and I also agree, we will return the signed papers by mail. I have been given a copy of the assent form to keep. If my parents agree that I can participate and I agree to participate, I will sign my name on the line below.

If I have additional questions or concerns, I can contact William Alex McIntosh, Ph.D. at (979) 845-8525 His address is Department of Rural Sociology, 2125 TAMU, Texas A& M University, College Station, TX 77843-2125. "This research study has been reviewed and approved by the Institutional Review Board - Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, the Institutional Review Board may be contacted through Dr. Richard E. Miller, IRB

Coordinator, Office of Vice President for Research and Associate Provost for Graduate Studies at (979) 845-8069.

____________________Date: __________ _______________Date: __________

Child's Signature Principal Investigator's Signature

Principal Investigator:
William Alex McIntosh
Department of Rural Sociology
2125 TAMU
Texas A&M University, College Station, TX 77843
Phone: 979-845-8525

Conditions of Payment

Subjects will be mailed money orders in the amount promised them ($25 for children; $20 for each parent) after they have completed their portion of the project. Should one family member complete participation, but the other family members fail to do, that participating family member will still receive his or her compensation.

APPENDIX H

CHILD / ADOLESCENT QUESTIONNAIRE

CONFIDENTIAL FORM

Revised Adolescent Questionnaire
Draft
Texas A&M University

Name of Interviewer ______________________________

Name of Respondent ______________________________

Address: ____________________ Phone No: ____________________

____

Household Number: ____________ Subject #: ______________

Date and Time of Appointment

Date: Time (am/pm)

______ ________

Date and Time of Reschedule (if necessary)

Date: Time (am/pm)

______ ________

______ ________

______ ________

READ:

I am going to ask you some questions and then read you your choices of answers. It is important that your answers be accurate and complete. Please take your time. Feel free to ask questions if at any point it is not clear what we are asking you. I will read each question exactly as it is worded in the questionnaire and then read to you the answer choices to each question. We are asking you to choose from among these choices the answer that comes closest to your answer. If you think that none of these answers comes very close to your answer, please tell me. Please remember that your answers will be kept confidential. They will not be reported to other people.

To start things off, we would like to ask you about who you live with at home? Do you live with your real or biological mom and dad, other relatives, or with step parents?

READ:

1. With "real" (biological) mom and dad
2. With real mom only (no other parent like a step parent present)
3. With real mom and step dad
4. With real dad and step mom
5. **With real mother and other relatives. Who is that?**

   ____
6. Adoptive or foster parents

Then Read:

We will be asking you questions about your mother and father. If you live with a step-mother or step-father most of the time, the questions we ask apply to them.

1. **Real mom and dad**
2. **Real mom**

ADOLESCENT SURVEY INSTRUMENT

3. When important family problems come up, which parent usually has the most influence in the decision making? (Interviewer: circle the appropriate response).

   READ:

   1. Father (step-father) usually
   2. Father (step-father) more often
   3. Both about equally
   4. Mother (step-mother) more often
   5. Mother (step-mother) usually

2. Suppose your parents disagree about something, which parent usually makes the final decision?

   1. Father (step-father) usually
   2. Father (step-father) more often
   3. Both about equally
   4. Mother (step-mother) more often
   5. Mother (step-mother) usually

3. In general, how are decisions made between you and your mother (step-mother)? **[Hand respondents card A and read with them]**

   1. My mother (step-mother) just tells me what to do.
   2. She listens to me, but makes the decision herself.
   3. I have considerable opportunity to make my own decisions, but she has the final word.
   4. My opinions are as important as my mother's (step-mother's) in deciding what I should do.
   5. I can make my own decision, but she would like me to consider her opinion.
   6. I can do what I want regardless of what she thinks.
   7. She doesn't care what I do.

4. In general, how are decisions made between you and your father (step-father)? **[Hand respondents card B and read with them]**

   1. My father (step-father) just tells me what to do.
   2. He listens to me, but makes the decision himself.
   3. I have considerable opportunity to make my own decisions, but he has the final word.
   4. My opinions are as important as my father's (step-father's) in deciding what I should do.
   5. I can make my own decision, but he would like me to consider his opinion.
   6. I can do what I want regardless of what he thinks.
   7. He doesn't care what I do.

READ:

[In the next questions, *parents* can include two parents, including step parents, or it can mean only one parent if only one parent (without a step parent) is present. **Circle the answer to each question.**]

5. Do your parents let you make your own decisions about what time you have to come home on weekend nights?

    1. Yes
    2. No

6. Do your parents let you make your own decisions about the people you hang around with?

    1. Yes
    2. No

7. Do your parents let you make your own decisions about what you wear?

    1. Yes
    2. No

8. Do your parents let you make your own decisions about how much television you watch?

    1. Yes
    2. No

9. Do your parents let you make your own decisions about which television programs you watch?

    1. Yes
    2. No

10. Do your parents let you make your own decisions about what time you go to bed on week nights?

    1. Yes
    2. No

11. Do your parents let you make your own decisions about what you eat at home?

    1. Yes
    2. No

12. We would like to ask you how your parents **reward** and **punish** you and how often they do it.

(A.) How often does your mother or step mother: **READ:**	**Then read**: Never	Very Seldom	Once in a While	Fre-quently	Very fre-quently
a. Give you praise, encouragement, or approval.	1	2	3	4	5
b. Discipline or punish you by nagging, yelling, scolding	1	2	3	4	5
c. Discipline by criticizing or making fun of you.	1	2	3	4	5
d. Discipline or punish you by spanking, slapping or hitting you.	1	2	3	4	5

(B.) How often does your father or step father: **READ:**	**Then read:** Never	Very Seldom	Once in a While	Fre-quently	Very fre-quently
a. Give you praise, encouragement, or approval.	1	2	3	4	5
b. Discipline or punish you by nagging, yelling, scolding.	1	2	3	4	5
c. Discipline by criticizing or making fun of you.	1	2	3	4	5
d. Discipline or punish you by spanking, slapping or hitting you.	1	2	3	4	5

13. For the next set of questions, please answer in terms of how often your mother does these things:

READ:	**Then read:** Never	Once in a While	Some-times	Usually	Almost Always	Always
a. She comforts and helps me when I have problems.	1	2	3	4	5	6
b. She makes me feel I can talk with her about everything.	1	2	3	4	5	6
c. She makes me feel she is there if I need her.	1	2	3	4	5	6
d. When she punishes me, she explains why.	1	2	3	4	5	6
e. When she wants me to do something, she explains why.	1	2	3	4	5	6
f. She helps me with homework or lessons if there is something I don't understand.	1	2	3	4	5	6
g. She teaches me things I want to learn.	1	2	3	4	5	6
h. I know what she expects of me and how she wants me to behave.	1	2	3	4	5	6
i. When I do something she doesn't like, I know exactly what to expect from her.	1	2	3	4	5	6
j. She encourages me to try new things on my own.	1	2	3	4	5	6
k. She lets me make my own plans about things I want to do even though I might make a few mistakes.	1	2	3	4	5	6

READ:	Then read: Never	Once in a While	Some-times	Usually	Almost Always	Always
l. She lets me off lightly when I do something wrong.	1	2	3	4	5	6
m. She cannot bring herself to punish me.	1	2	3	4	5	6
n. She expects me to keep my things neat.	1	2	3	4	5	6
o. She expects me to help around the house or yard.	1	2	3	4	5	6
p. She keeps after me to do well in school.	1	2	3	4	5	6
q. She keeps after me to do better than other children.	1	2	3	4	5	6
r. She wants to know exactly where I am going when I go out.	1	2	3	4	5	6
s. She expects me to tell her exactly how I spend my money.	1	2	3	4	5	6
t. She worries that I cannot take care of myself.	1	2	3	4	5	6
u. She won't let me go places because something might happen to me.	1	2	3	4	5	6
v. When I do something she doesn't like, she acts hurt and disappointed.	1	2	3	4	5	6
w. She punishes me by trying to make me feel guilty and ashamed.	1	2	3	4	5	6
x. She punishes me by not allowing me to be with my friends.	1	2	3	4	5	6

READ:	Then read: Never	Once in a While	Some-times	Usually	Almost Always	Always
y. She punishes me by not letting me use my favorite things for awhile.	1	2	3	4	5	6

14. For the next set of questions, please answer in terms of how often your father does these things: **[Skip if no father is present in household]**

READ:	Then read: Never	Once in a while	Some-times	Usually	Almost always	Always
a. He comforts and helps me when I have problems.	1	2	3	4	5	6
b. He makes me feel I can talk with him about everything.	1	2	3	4	5	6
c. He makes me feel he is there if I need him.	1	2	3	4	5	6
d. When he punishes me, he explains why.	1	2	3	4	5	6
e. When he wants me to do something, he explains why.	1	2	3	4	5	6
f. He helps me with homework or lessons if there is something I don't understand.	1	2	3	4	5	6
g. He teaches me things I want to learn.	1	2	3	4	5	6
h. I know what he expects of me and how he wants me to behave.	1	2	3	4	5	6
i. When I do something he doesn't like, I know exactly what to expect from him.	1	2	3	4	5	6

READ:	Then read: Never	Once in a while	Some-times	Usually	Almost always	Always
j. He encourages me to try new things on my own.	1	2	3	4	5	6
k. He lets me make my own plans about things I want to do even though I might make a few mistakes.	1	2	3	4	5	6
l. He lets me off lightly when I do something wrong.	1	2	3	4	5	6
m. He cannot bring himself to punish me.	1	2	3	4	5	6
n. He expects me to keep my things neat.	1	2	3	4	5	6
o. He expects me to help around the house or yard.	1	2	3	4	5	6
p. He keeps after me to do well in school.	1	2	3	4	5	6
q. He keeps after me to do better than other children.	1	2	3	4	5	6
r. He wants to know exactly where I am going when I go out.	1	2	3	4	5	6
s. He expects me to tell him exactly how I spend my money.	1	2	3	4	5	6
t. He worries that I cannot take care of myself.	1	2	3	4	5	6
u. He won't let me go places because something might happen to me.	1	2	3	4	5	6
v. When I do something he doesn't like, he acts hurt and disappointed.	1	2	3	4	5	6

READ:	Then read: Never	Once in a while	Some-times	Usually	Almost always	Always
w. He punishes me by trying to make me feel guilty and ashamed.	1	2	3	4	5	6
x. He punishes me by not allowing me to be with my friends.	1	2	3	4	5	6
y. He punishes me by not letting me use my favorite things for awhile.	1	2	3	4	5	6

15. **[Hand respondent card C.]** Which of the things listed on this card have you done with your mother (step mother) in the past 4 weeks? **(Circle all that apply)**

1. Gone shopping
2. Played a sport or worked out
3. Gone to a religious service or church-related event
4. Talked about someone you're dating, or a party you went to
5. Gone to a movie, play, museum, or concert, or sports event
6. Had a talk about a personal problem you were having
7. Had a serious argument about your behavior
8. Talked about your school work or grades
9. Talked about other things you're doing in school

16. Which of these things have you done with your father (step father) in the past 4 weeks? **(Circle all that apply) [Use card C]**

1 Gone shopping
2. Played a sport or worked out together
3. Gone to a religious service or church-related event
4. Talked about someone you're dating, or a party you went to
5. Gone to a movie, play, museum, or concert, or sports event
6. Had a talk about a personal problem you were having
7. Had a serious argument about your behavior
8. Talked about your school work or grades
9. Worked on a project for school
10. Talked about other things you're doing in school

SELF-ESTEEM

17. Now we would like to ask you some questions about how you feel about yourself. Remember, all of these answers will be kept confidential.

Read:	**Then Read:** Strongly Agree	Agree	Disagree	Strongly Disagree
a. I feel I'm as good a person as others are.	1	2	3	4
b. I feel that I have a number of good qualities.	1	2	3	4
c. All in all, I feel like that I am a failure.	1	2	3	4
d. I am able to do things as well as most other people.	1	2	3	4
e. I feel I do not have much to be proud of.	1	2	3	4
f. I feel positive about myself.	1	2	3	4
g. On the whole, I am satisfied with myself.	1	2	3	4
h. I wish I could have more respect for myself.	1	2	3	4
i. I feel useless at times.	1	2	3	4
j. Sometimes I think I am no good at all.	1	2	3	4

HEALTH AND NUTRITION SECTION

Now we would like to ask you some questions about your weight and about dieting.

18. How much do you weigh? ____________

19. Would you say that you are:
READ:

1. gaining weight?
2. staying at the same weight?
3. losing weight?

20. Do you think you are:
READ:

1. very thin?
2. slightly thin?
3. about average?
4. slightly overweight?
5. very overweight?

21. How much do you think you should weigh? ____________

22. Do you plan to lose weight to get to this weight?

1. Yes
2. No
3. Don't need to

23. Do you think others believe you weigh too much?

1. Yes
2. No

24. Are you now dieting to lose weight?

1. Yes
2. No

25. If you have ever dieted, how old were you when you first started to diet? (I have never dieted is an acceptable response).

____

26. Are you trying to lose weight, gain weight, or stay the same weight?
READ:

1. Lose weight (*ask Q 27*)
2. Gain weight *(skip to Q 28)*
3. Stay the same weight
4. not trying to do anything about weight

27. During the past 7 days, which of the following things did you do in order to lose weight or to keep from gaining weight? **(Circle all that apply) [Show Card D]**
READ:

1. Ate less food
2. Ate less fat
3. Ate fewer calories
4. Fasted
5. Exercised more
6. Made yourself throw-up
7. Took diet pills
8. Took laxatives
9. Smoked cigarettes
10. Other (please specify/describe) ________________________________
11. NONE

28. During the past 7 days, which of the following things did you do in order to gain weight or to build muscle? **[Show Card E]**

1. Ate more food
2. Ate more protein
3. Exercised
4. Lifted weights
5. Took food supplements
6. Used steroids or supplements such as Creatine or "Andro"
7. Other (please specify/describe) ________________________________
8. NONE

29. I'd like to ask you some things about your friends and your parents.

READ:		Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a.	My mother thinks I weigh too much.	1	2	3	4	5
b.	My mother talks about dieting all the time.	1	2	3	4	5
c.	My mother thinks I eat too much.	1	2	3	4	5
d.	My mother thinks I need to exercise more.	1	2	3	4	5
e.	My mother thinks we should exercise together.	1	2	3	4	5

READ:		Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
f.	My mother weighs too much.	1	2	3	4	5
g.	My mother thinks I need to gain weight.	1	2	3	4	5
h.	My mother thinks we need to go on a diet together.	1	2	3	4	5
i.	My father thinks I weigh too much.	1	2	3	4	5
j.	My father talks about dieting all of the time.	1	2	3	4	5
k.	My father thinks I eat too much.	1	2	3	4	5
l.	My father thinks I need to exercise more.	1	2	3	4	5
m.	My father thinks we should exercise together.	1	2	3	4	5
v.	My father weighs too much.	1	2	3	4	5
w.	My father thinks I need to gain weight.	1	2	3	4	5
x.	My father thinks we need to go on a diet together.	1	2	3	4	5

30. About how many days a week do you eat breakfast? _______

31. About how many times a day do you have a snack (not counting your meals)? _______

32. How many times a week do you take vitamins, minerals, or other supplements?
READ:

1. Never
2. < 2 times a week
3. 2-4 times a week
4. 5-7 times a week

33. During the past month, have you taken supplements in pill, liquid, or powdered form? Would you bring me some the containers of the supplements so that I can see labels? **[If the containers are brought to you, check all that apply. If they are not available, give the Card F to the subject so that he or she can tell you which ones were taken] [Record the type or types of supplements]**

____ multiple vitamin
____ multiple vitamin/multiple mineral
____ vitamin A
____ beta-carotene
____ vitamin D
____ vitamin E
____ thiamin
____ riboflavin
____ niacin
____ vitamin B6
____ vitamin B12
____ folic acid
____ pantothenic acid
____ biotin
____ vitamin C
____ other vitamins? List

____ calcium
____ magnesium
____ iron
____ zinc
____ selenium
____ phosphorus
____ iodine
____ chromium **picolinate**
____ other minerals? List

____ protein
____ amino acids
____omega-3 fatty acids

____ bee pollen
____ carnitine
____ coenzyme Q10
____ creatine
____ ginseng
____ brewer's yeast

____ guarana
____ royal jelly
____ spirulina
____ St. John's Wort
____ **Echinacea**
____ other supplements: ____________________
____
____

34. Do you smoke cigarettes?

1. Yes
2. No

[If answer is yes] How many packs do you smoke everyday? __________

35. **[If the respondent smokes]** Did you start to smoke to help you lose weight?

    1. Yes
    2. No

36. Do you drink alcoholic beverages (like beer, wine, or hard liquor)?

    1. Yes
    2. No

    [If answer is yes] How many drinks (cans, glasses, shots) do you have everyday? __________

37. **For females subjects only. If male subject, skip to question 39.**
    Have you ever been pregnant? Yes No

38. **If female, ask**: At what age did you have your first period? ____________________

39. Do you play a team sport?

    1. Yes
    2. No

    If yes, how many hours a day do you usually practice? ____________

40. Are you more active physically than most people your age, less active than most people your age or about as active as people your age?

    1. More active
    2. About the same
    3. Less active

41. Do you exercise for a minimum of 30 minutes at least five times a week?

    1. Yes
    2. No

42. How many times in the past 14 days have you done at least 30 minutes of exercise <u>hard</u> enough to make you breathe heavily and make your heart beat fast? (Hard exercise includes, for example, playing basketball, **jogging**, or **fast** bicycling; include time in physical education class)

    1. None
    2. 1 to 2 days
    3. 3 to 5 days
    4. 6 to 8 days
    5. 9 or more days

43. How many times in the past 14 days have you done at least 30 minutes of light exercise that was not hard enough to make you breathe heavily and make your heart beat fast? (Light exercise includes playing basketball, **walking** or slow bicycling; include time in physical education class)

1. None
2. 1 to 2 days
3. 3 to 5 days
4. 6 to 8 days
5. 9 or more days

44. Does anyone in your family exercise for a minimum of 30 minutes at least five times a week?

1. Yes
2. No

45. During a normal week how many hours a day do you watch television and videos, or play computer video games, **or game boy** before or after school?
Is that:

1. None
2. 1 hour or less
3. 2 to 3 hours
4. 4 to 5 hours
5. 6 to 7 hours
6. 8 to 9 hours
7. 10 to 11 hours
8. 12 to 13 hours
9. More than 13 hours

46. Some of my friends exercise for a minimum of 30 minutes at least five times a week.

1. Yes
2. No

47. What time do you usually go to bed on week nights? **[Write in time in this format HH:MM A for AM or HH:MM P for PM. HH = hour; MM = minutes. Please remember that midnight is 12:00A and noon is 12:00P!]**

______
HH:MM (A or P)

48. **About how** many hours of sleep do you usually get **every night**?

______ hours

49. Do you usually get enough sleep?

1. Yes
2. No

50. We would next like to ask you how your mother, father and your friends feel about your eating habits.

READ:	Never	Once in a while	Frequently	Very frequently
a. My mother frequently criticizes the things I eat.	1	2	3	4
b. My father frequently criticizes the things I eat.	1	2	3	4
c. My friends frequently criticize the things I eat.	1	2	3	4
d. I usually eat more food when I'm with my friends.	1	2	3	4
e. My mother thinks I eat too much "junk" food.	1	2	3	4
f. My father thinks I eat too much "junk food"	1	2	3	4
g. When I'm with my friends I can eat what I want.	1	2	3	4

51. Next, I'd like to ask you about some of your eating habits.

Read	**Then Read:** Every-day	A couple of days a week	About once a week	A couple of times a month	About once a month	Several times a year	Never
a. How often do you eat breakfast with your family?	1	2	3	4	5	6	7
b How often do you eat lunch with your family?	1	2	3	4	5	6	7
c. How often do you eat dinner with your family?	1	2	3	4	5	6	7d.
d. How often do you have a snack at a friend's home?	1	2	3	4	5	6	7
e. How often do you go out to dinner with your family?	1	2	3	4	5	6	7

52. How important is it for <u>you</u> to eat dinner with your family?
READ:

1. Not important at all
2. Somewhat important
3. Important
4. Very important

53. Now I am going to ask you about where your foods and drinks came from during the last 7 days.

1. How **many times** did you get food or drinks from a fast food restaurant in the last 7 days? (We mean food you bought yourself.) ________

2. How **many times** did you get food or snacks from a grocery or convenience store during the last 7 days? (We mean food you bought yourself.) ___________

54. How many times last week was at least one of your parents in the room with you while you ate your dinner?

_______________ days

55. Next, how often does your family do the following things:

READ:		**Then Read:** Never	Sometimes	Always
a.	My family eats at the same time every night.	1	2	3
b.	At least some of my family eats breakfast together every morning.	1	2	3
c.	My family eats lunch together every Sunday.	1	2	3
d.	My whole family eats together every night.	1	2	3
e.	When I eat breakfast in the morning, I usually watch TV.	1	2	3
f.	When I eat dinner, I usually watch TV at the same time.	1	2	3

56. How much do you agree or disagree with the following statements about dinnertime in your family?

Read:		**Then Read:** Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a.	People in my family eat dinner whenever they want	1	2	3	4	5
b.	You never know who will be home for dinner in my family.	1	2	3	4	5
c.	In my family, dinnertime is more than just a meal; it is a special time.	1	2	3	4	5
d.	In my family, everyone has a specific job or task to do at dinnertime.	1	2	3	4	5
e.	In my family, we eat together regularly.	1	2	3	4	5
f.	In my family we have a special family food night when we order "take out" food like pizza or go to a restaurant together.	1	2	3	4	5
g.	In my family it is important that the family eats at least one meal together every day.	1	2	3	4	5
h.	I enjoy eating meals with my family	1	2	3	4	5
i.	In my family, eating brings people together in an enjoyable way.	1	2	3	4	5
j.	In my family, mealtime is a time for talking with other family members.	1	2	3	4	5
k.	In my family, mealtime has often been a time when people argue.	1	2	3	4	5
l.	In my family, it is okay for a child to make something else to eat if he/she doesn't like the food being served.	1	2	3	4	5
m.	In my family, a child should eat all of the foods served even if he/she doesn't like them.	1	2	3	4	5

57. I would like to ask you a few things about what your parents do about food.

Read:	**Then Read:** Strongly disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a. My parents buy the kinds of foods I like.	1	2	3	4	5
b. My parents buy the kinds of snacks I like.	1	2	3	4	5
c. My parents cook the kinds of foods I like.	1	2	3	4	5
d. My parents let me choose what will be served for dinner.	1	2	3	4	5
e. My parents let me pick out what kind of breakfast cereals I want.	1	2	3	4	5
f. I don't have to eat all the things my parents cook.	1	2	3	4	5
g. My parents never make me eat things I don't like.	1	2	3	4	5

The next set of questions are about the money you get and the money you spend.

58. Do you get an allowance or money for helping out around the house from your parents or someone else?
READ:

1. Yes
2. No

IF YES, ASK: How often do you get this money?

_____ more than once a week _____once a week _____ every two weeks

_____ once a month _____ other (Have them tell you how often): _____

IF YES, ASK how much money do you get?

____

59. Do you have a job?

1. Yes
2. No

IF YES, ASK:

READ:	**Record Answer:**	
a. What kind of place do you work for?		
b. What kind of work do you normally do? That is, what is your job called?		
c. What do you actually do in your job? Tell me, what are your main duties?		
d. Are you self-employed or do you work for someone else?		
e. About how much do you get paid each month in your job?		
f. If you get tips or any other kind of extra money, how much do you usually get each month?	Salary?	Tips?
g. Do you have to give your parents or someone else any of the money you make from your job?	1. Yes	2. No
h. **If Yes**, How much of your income do you keep for yourself? **(In dollars)**		

60. Next we would like to know how you spend your money. We will read you a list of things and ask you about how much money you spend on these things each month.

STATE:	THEN ASK: How much do you spend?
a. Foods or drinks you eat at home.	______
b. Foods or drinks you eat away **from** home.	______
c. Phone bill.	______
d. Money to ride the bus.	______
e. Medicine like aspirin or vitamin pills.	______
f. Clothes and shoes.	______
g. Buying CDs or DVDs.	______
h. Buying video games.	______
i. Renting movies or video games.	______

61. What is your ethnic background?

    a. Mexican American
    b. Anglo
    c. Black
    d. Other. Please specify: ____________________

62. Gender

    1. Male
    2. Female

63. How old are you? _____

THANK YOU FOR YOUR HELP WITH OUR STUDY.

APPENDIX I

PARENT QUESTIONNAIRE

CONFIDENTIAL FORM

Revised Parent Questionnaire
Draft
Texas A&M University

Name of Interviewer: ____

Name of Respondent: ____

Address: ____________________ Phone No. ________________________

____

(Name of teenager in the study: ____________________)

Subject Number: __________

Date and Time of Appointment

Date: Time (am/pm)

______ __________

Date and Time of Reschedule (if necessary)

Date: Time (am/pm)

______ __________

______ __________

______ __________

READ:

Hi: I'm ______________ calling from Texas A&M University for the Parent Time and Children's Nutrition Project. Is this still a good time to interview you?

I am going to ask you some questions and then read you your choices of answers. It is important that your answers be accurate and complete. Please take your time. I will read each question exactly as it is worded in the questionnaire and then read to you the answer choices to each question. We are asking you to choose from the choices that comes closest to your answer. If you think that none of these answers come very close to your answer, please tell me. If necessary, feel free to ask me to repeat the question.

PARENT INTERVIEW SCHEDULE

SECTION I

To start off, we want to ask you some questions about your work.

1. Were you employed at any time during the last 12 months?

   Yes 1   **If yes, skip to question 3.**
   No 2

2. If you answered no to the previous question, what is the reason you did not work during the last 12 months?

   READ:

   Retired 1
   Taking care of home/family 2
   Going to school 3
   Ill, disabled, unable to work . . . 4
   Unable to find work 5
   Other, please specify ___________________________
   [If not working at present, skip to question 16 on page 7]

3. Indicate which of the following best describes your employment over the last 12 months.

   READ:

   Part time 1
   Full time 2
   Both 3

4. If you were working last week, how many hours did you work last week, at all jobs?

   Hours _________

5. A. What kind of work do you (did you) normally do? That is, what (is/was) your job called?

   OCCUPATION: ______________________________

   B. What do/did you actually do in that job? Tell me, what are/were some of your main duties?

   ____

C. What kind of place do/did you work for?

INDUSTRY: ____________________

D. What do/did they make/do? ____________________________________

E. Are/Were you self employed or do/did you work for someone else? ________

IF CURRENTLY WORKING FULL-TIME, PART-TIME, OR WITH A JOB, ASK QUESTION 6; IF NOT SKIP TO QUESTION 16 ON PAGE 7.

6. What days of the week do you normally work? **CIRCLE ONE CODE.**

RESPONSE	**CIRCLE**
Works Monday through Friday	1
Works Monday-Fridays and some Saturdays	2
Works Monday-Friday and some Sundays	3
Works Saturday and Sunday plus some Monday through Friday	4
No set schedule	5
Other, please specify: ______________	
Don't know	9

7. What hours do you usually work -- days, evenings, or nights?

RESPONSE	**CIRCLE**
Days (between 8am and 6 pm)	1
Evenings (between 6 pm and midnight)	2
Nights (between midnight and 8 am)	3
No set schedule, varies	4
Other, please specify: ______________	5
No answer	9

8. How flexible are your work hours?

READ	**CIRCLE**
Inflexible	1
Somewhat flexible	2
Very flexible	3

9. How flexible are your work days?

READ	**CIRCLE**
Inflexible	1
Somewhat flexible	2
Very flexible	3

WE WOULD NEXT LIKE TO ASK YOU HOW YOU FEEL ABOUT YOUR WORK

10. First, we would like to know how you feel about your job. Tell me if you strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree with each of the following statements.

READ:	**THEN READ:** Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a. My work is the most important thing in my life.	1	2	3	4	5
b. My family is more important to me than my work.	1	2	3	4	5
c. Sometimes on weekends I wish I were back at work.	1	2	3	4	5
d. Even if I had enough money to live the way I want for the rest of my life, I would keep working.	1	2	3	4	5
e. Sometimes I bring work home with me to finish up.	1	2	3	4	5

11. Next we would like to ask you a few questions about the company or organization you work for. Tell me if you strongly disagree, disagree, neither agree/disagree, agree, or strongly agree with the following:

READ:	**Then read:** Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree
a. I feel very little loyalty to my company or organization.	1	2	3	4	5

READ:	Then read: Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree
b. I could just as well be working for a different company or organization.	1	2	3	4	5
c. It would take very little change in my present circumstances to cause me to leave my company or organization.	1	2	3	4	5
d. I tell other people that my company or organization is a great place to work.	1	2	3	4	5
e. It doesn't matter who you work for as long as they treat you right.	1	2	3	4	5
f. It doesn't matter who you work for as long as they pay you enough.	1	2	3	4	5
g. Thinking about my company or organization I wouldn't want to work any place else.	1	2	3	4	5
h. It wouldn't take much to cause me to look for another job.	1	2	3	4	5
i. Thinking about my company or organization, I feel like I really fit in.	1	2	3	4	5

12. We would like to ask you about how much freedom you have to make decisions regarding your work and the place you work. How true are the following statements?

READ:	Then read: Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree
a. There can be little action here until a supervisor approves a decision.	1	2	3	4	5
b. A person who wants to make his or her own decisions would be quickly discouraged.	1	2	3	4	5

READ:	**Then read:** Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree
c. Even small matters have to be referred to someone higher up for a final decision.	1	2	3	4	5
d. I have to ask my boss before I do almost anything.	1	2	3	4	5
e. I am allowed to do some of my work at home.	1	2	3	4	5
f. I am allowed to work longer some days so I can take time off on other days.	1	2	3	4	5

SECTION II

In this next group of questions, we would like to ask you about various conditions inside and outside your home.

(ASK THESE QUESTIONS OF THE EMPLOYED RESPONDENTS ONLY; SKIP TO QUESTION 16 IF THE RESPONDENT IS NOT EMPLOYED)

13. How often do the following things happen to you?

READ:	**Then read:** Very Infre-quently	Infre-quently	Some-times	Fre-quently	Very Fre-quently
a. I experience conflicts between my work responsibilities and my family responsibilities.	1	2	3	4	5
b. I am able to give my children the attention they need.	1	2	3	4	5
c. I sometimes miss out on the pleasures of being a parent.	1	2	3	4	5

d. I worry about the effects my job may have on my children.	1	2	3	4	5
e. My problems at work spill over into my family.	1	2	3	4	5
f. I feel "stressed out" by my work.	1	2	3	4	5
g. I feel frustrated by my job.	1	2	3	4	5

14. What are your working conditions like?

READ: "At Work. . ."	Then read: Very In-frequently	In-frequently	Sometimes	Frequently	Very Frequently
a. I have to work very fast	1	2	3	4	5
b. I have to work very hard	1	2	3	4	5
c. I have more work than time to do it in	1	2	3	4	5
d. I have deadlines that are hard to meet	1	2	3	4	5

15. I would next like to ask you some questions about how you deal or cope with your work.

READ: "At Work ....."	Then read: Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a. I try to work as hard as I can so I can stay ahead of things.	1	2	3	4	5
b. I try to anticipate busy times by planning ahead	1	2	3	4	5
c. I tell myself its not the end of the world if I don't finish my work on time.	1	2	3	4	5
d. I am careful not to get too involved in too many things.	1	2	3	4	5

e. I complete my work on time by making steady progress.	1	2	3	4	5
f. It's useless to plan ahead.	1	2	3	4	5

SECTION III

ASK OF ALL RESPONDENTS

16. How are things at home?

READ "AT HOME":	**Then read:** Very Infre-quently	Infre-quently	Some-times	Fre-quently	Very Fre-quently
a. I don't get enough help from others.	1	2	3	4	5
b. I have more work to do than time to do it in.	1	2	3	4	5
c. I am frequently interrupted when I am doing housework.	1	2	3	4	5
d. My spouse expects more than he/she gives in return.	1	2	3	4	5
e. There is not enough opportunity to be the person I want to be.	1	2	3	4	5
f. My spouse does his/her share of the housework.	1	2	3	4	5
g. I can't be myself around my spouse.	1	2	3	4	5
h. My spouse is easy to talk with.	1	2	3	4	5
i. My spouse is willing to listen to my problems.	1	2	3	4	5

	Always rushed	Sometimes rushed	Almost never rushed
17. Would you say you always feel rushed, even to do the things you have to do, only sometimes feel rushed, or almost never feel rushed?	1	2	3

18. Do you ever do housework such as laundry or grocery shopping? **[If yes, ask them Q19] [If no, ask Q20]**

Yes _______ No _______

19. We would also like to know how you deal with your work around the house. **Ask only of those who do housework**

READ:	**Then read:** Strongly Agree	Agree	Neither Agree/ Disagree	Disagree	Strongly Disagree
a. I have made an effort to find ways to save time in doing my housework.	1	2	3	4	5
b. I try to do all of my family members' laundry at the same time.	1	2	3	4	5
c. I try to do all of the laundry once a week.	1	2	3	4	5
d. I do all my grocery shopping for the week in one trip to the grocery store.	1	2	3	4	5
e. I try to do several house chores at the same time.	1	2	3	4	5

SECTION IV

In this part of the questionnaire, I'd like to ask you a few things about your family.

20. Certain things have to be done in every household. Please tell me who does the following tasks in your family. (CIRCLE THE APPROPRIATE NUMBER)
(IF THE RESPONDENT ANSWERS 'OTHER,' FIND OUT WHO THIS IS)

READ	**Then read:** Wife Always	Wife Usually	Both Equally	Husband Usually	Husband Always	Other →	**[Ask]** Who:
a. Who is usually responsible for the housework such as cleaning and laundry?	1	2	3	4	5	6	_______

READ	Then read: Wife Always	Wife Usually	Both Equally	Husband Usually	Husband Always	Other →	[Ask] Who:
b. Who is usually responsible for preparing dinner?	1	2	3	4	5	6	_______
c. Who is usually responsible for preparing breakfast?	1	2	3	4	5	6	_______
d. Who is usually responsible for looking after the children?	1	2	3	4	5	6	_______
e. Who is usually responsible for household repairs?	1	2	3	4	5	6	_______
f. Who is usually responsible for car maintenance and repair?	1	2	3	4	5	6	_______

21. Do you ever have anyone come in to clean the house for you?

Never	Sometimes	Frequently
1	2	3

22a. Every family has to make decisions about **whether to buy** such things like groceries, furniture or cars. We would like to find out who usually makes such decisions. We will read you a list of things that people usually buy and then ask you who in your family makes the decision to buy each thing.

PURCHASE DECISION	Husband Only	Husband More	Husband & Wife the same	Wife More	Wife Only
1. Whether to buy or rent a house	1	2	3	4	5
2. Whether to buy a car	1	2	3	4	5

PURCHASE DECISION	Husband Only	Husband More	Husband & Wife the same	Wife More	Wife Only
3. Whether to buy appliances such as a refrigerator, washer or dryer	1	2	3	4	5
4. Whether to buy furniture	1	2	3	4	5
5. Whether to buy electronic equipment, computer, television or sound system	1	2	3	4	5
6. Whether to buy groceries	1	2	3	4	5
7. Whether to eat out	1	2	3	4	5
8. Whether to buy clothing and footwear for household members	1	2	3	4	5
9. Whether to buy school supplies	1	2	3	4	5

22b. Given a decision has been made to buy an item, every family also has to make decisions about **how much to spend** on such things as rent, groceries, furniture, or cars. We would like to find out who makes these decisions. We will read you a list of things and ask you who decides how much to spend on each thing.

PURCHASE AMOUNT	Husband Only	Husband More	Husband & Wife the same	Wife More	Wife Only
1. How much to spend on rent or mortgage payments	1	2	3	4	5
2. How much to spend on a car	1	2	3	4	5
3. How much to spend on appliances, such as a refrigerator, washer or dryer	1	2	3	4	5
4. How much to spend on furniture	1	2	3	4	5
5. How much to spend on electronic equipment, computer, television or sound system	1	2	3	4	5
6. How much to spend on groceries	1	2	3	4	5
7. How much to spend on eating out	1	2	3	4	5

PURCHASE AMOUNT	Husband Only	Husband More	Husband & Wife the same	Wife More	Wife Only
8. How much to spend on clothing and footwear for household members	1	2	3	4	5
9. How much to spend on school supplies	1	2	3	4	5

SECTION V

23. We now would like to talk with you about your opinions about the amount and type of food you think your child should eat. **[Skip to Question 26 if they have no opinions]**

READ:	**Then read:** Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a. My child should always eat all of the food on her/his plate.	1	2	3	4	5
b. I have to be especially careful to make sure my child eats enough.	1	2	3	4	5
c. If my child says "I'm not hungry", I try to get her/him to eat anyway.	1	2	3	4	5
d. If I did not guide or regulate my child's eating, she/he would eat much less than she/he should.	1	2	3	4	5

24. Parents sometimes try to keep track of the amount of food their children eat. Do you? **[Skip to Question 26 if they do not]**

READ:	**Then read:** Never	Infrequently	Frequently	Always
a. How much do you keep track of the sweets (like candy, ice cream, cakes, pies, pastries) that your child eats?	1	2	3	4

b. How much do you keep track of the snack food (like potato chips, Doritos, cheese puffs) that your child eats?	1	2	3	4
c. How much do you keep track of the high fat foods that your child eats?	1	2	3	4

25. Some parents are concerned about what their children eat; others are not.

READ:	**Then read:** Unconcerned	Somewhat Concerned	Concerned	Very Concerned
a. How concerned are you about your child eating too much when you are not around her/him?	1	2	3	4
b. How concerned are you about your child having a diet to maintain a desirable weight?	1	2	3	4
c. How concerned are you about your child becoming overweight?	1	2	3	4

THE NEXT SET OF QUESTIONS HAVE TO DO WITH COOKING AND SHOPPING

26. I would next like to ask you some questions about your opinions about your family's eating practices. **(Ask of parent that prepares meals or who shops. Skip to Q30 if respondent does not cook or shop)**

READ:	**Then Read:** Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree
a. I try to schedule dinner so that the whole family can eat together.	1	2	3	4	5
b. When I'm in a hurry, I pick up "take out" food for dinner.	1	2	3	4	5
c. At breakfast, everyone must fend for themselves at my house.	1	2	3	4	5

27. I would like to ask you a few questions about you, your teenager, and food.

READ:	Then Read: Never	Very Seldom	Occasion-ally	Fre-quently	Very Fre-quently	N/A
a. How frequently do you talk to ____ about the importance of eating healthy foods?	1	2	3	4	5	6
b. How frequently do you worry about ______ eating habits?	1	2	3	4	5	6
c. How frequently do you encourage ___ to eat a low fat diet?	1	2	3	4	5	6
d. How frequently do you try to make sure ___doesn't eat too much junk food?	1	2	3	4	5	6
e. How frequently does ____eat dinner with the family?	1	2	3	4	5	6
f. How frequently does ____help you cook dinner?	1	2	3	4	5	6

SECTION VI

28. We would like to ask you some questions about cooking and serving food. Do you ever cook or serve food in the household? **[If no, skip to question 30]**

Read:	Then Read: Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree	N/A
a. I consider my family's health when I buy food.	1	2	3	4	5	6
b. I think the new easy-to-prepare foods are great.	1	2	3	4	5	6
c. Money is the thing I consider most when I plan meals.	1	2	3	4	5	6
d. I like meals that are easy to prepare.	1	2	3	4	5	6

Read:	Then Read: Strongly Disagree	Disagree	Neither Agree / Disagree	Agree	Strongly Agree	N/A
e. When I get home at night, I'm just too tired to fix much of a meal.	1	2	3	4	5	6
f. It is important to me to prepare meals that the whole family enjoys.	1	2	3	4	5	6
g. Because of my schedule, we frequently go to a fast food place for dinner.	1	2	3	4	5	6
h. At dinner time my family helps me with the cooking.	1	2	3	4	5	6
i. I buy only the best quality food.	1	2	3	4	5	6

29. We now want to ask you a few questions about things you do while shopping for food.

READ:	Then Read: Never	Very Seldom	Once in a while	Fre-quently	Very Fre-quently	N/A
a. How frequently do you read food labels to find out the amount of calories the food contains?	1	2	3	4	5	6
b. How frequently do you read food labels to find out the amount of fat the food item contains?	1	2	3	4	5	6
c. How frequently do you read food labels to determine the type of fat the food item contains?	1	2	3	4	5	6
d. Do you ever broil rather than fry your meat in order to reduce the amount of fat in it?	1	2	3	4	5	6
e. Do you ever remove the skin from your chicken before you eat it?	1	2	3	4	5	6

SECTION VII

HEALTH AND NUTRITION

Now we would like to ask you some questions about your weight and about dieting.

30. How much do you weigh? ______

31. How tall are you? ______

32. Would you say that you are:

    1. gaining weight?
    2. staying at the same weight?
    3. losing weight?

33. Do you think you are:

    1. very thin?
    2. slightly thin?
    3. about average?
    4. slightly overweight?
    5. very overweight?

34. What would be your ideal weight? __________

35. Do you plan to lose weight to get to this weight?

    1. Yes
    2. No
    3. Don't need to

36. Do you think others believe you weigh too much?

    1. Yes
    2. No

37. How old were you when you first tried to lose weight? (I have never dieted is an acceptable response).

    ____

38. During the past 7 days, which of the following things did you do in order to lose weight or to keep from gaining weight? **(Circle all that apply)**

    1. Ate less food
    2. Ate less fat
    3. Ate fewer calories
    4. Fasted
    5. Exercised
    6. Made yourself throw up
    7. Took diet pills
    8. Took laxatives
    9. Smoked
    10. Other: please specify/describe ______________________________
    11. NONE

39. During the past 7 days, which of the following things did you do in order to gain weight or to build muscle? **(Circle all that apply)**

    1. Ate more food
    2. Ate more protein
    3. Exercised
    4. Lifted weights
    5. Took food supplements such as Andro or Creatine
    6. Other
    7. NONE

40. About how many days a week do you eat breakfast? _______

41. About how many times a day do you have a snack (not counting your meals)? _______

42. How many times a week do you take vitamins, minerals, or other supplements?

    1. Never
    2. < 2 times a week
    3. 2-4 times a week
    4. 5-7 times a week

43. Do you smoke cigarettes?

    1. Yes
    2. No **[If no, skip to Q45]**

    If answer is yes, record the number of packs smoked each day. _____

44. Did you start to smoke to help you lose weight?

    1. Yes
    2. No

45. Do you drink alcoholic beverages (like beer, wine, or hard liquor)?

    1. Yes
    2. No

    [If answer is yes] How many drinks (cans, glasses, shots) do you have each day? _____

46. Would you say you are more active physically than most people your age, less active than most people your age or about as active as people your age?

    1. More active
    2. About the same
    3. Less active

47. I exercise for a minimum of 30 minutes at least five times a week.

    1. Yes
    2. No

48. Members of my family exercise for a minimum of 30 minutes at least five times a week.

    1. Yes
    2. No

49. What time do you usually go to bed on week nights? *Write in time in this format HH:MM A for AM or HH:MM P for PM. Please remember that midnight is 12:00A and noon is 12:00P!*

    ____
    HH:MM (A or P)

50. How many hours of sleep do you usually get?

    ______ hours

51. Do you usually get enough sleep?

    1. Yes
    2. No

52. Has your child ever been diagnosed with the following disorders/**conditions**: (condition may be a better word to use than disorder)

____ Asthma ____ Diabetes ____ Heart disease

____ High blood cholesterol ____ Eating disorder ____ Other ____________

____ Attention Deficit Hyperactivity Disorder (ADHD)

53. Has your child been hospitalized in the past 6 months? 1. Yes 2. No

If yes, why? ____

54. Has your child had any broken bones in the past 6 months? 1. Yes 2. No

If yes, which ones: ___________________________________

55. Does your child take any prescribed medications on a regular basis?

1. Yes 2. No

If yes, what medication does ______________ (child's name) usually take?

______________________________ Why was it prescribed? _____________________

Any other medication? ___________ Why was it prescribed? _____________________

Any other medication? ___________ Why was it prescribed? _____________________

Any other medication? ___________ Why was it prescribed? _____________________

Any other medication? ___________ Why was it prescribed? _____________________

56. I would next like to ask you about some of the things your family does about meals.

How often does your family do the following things **READ:**	**Then Read:** Never	Sometimes	Always
a. My family eats at the same time every night.	1	2	3
b. At least some of my family eats breakfast together every morning.	1	2	3
c. My family eats lunch together on special family days.	1	2	3
d. My whole family eats together every night.	1	2	3

How often does your family do the following things **READ:**	**Then Read:** Never	Sometimes	Always
e. When you eat breakfast in the morning, do you ever watch TV?	1	2	3
f. When you eat dinner, do you ever watch TV at the same time?	1	2	3

57. How much do you agree or disagree with the following statements about dinnertime in your family?

Read:	**Then Read:** Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
a. People in my family eat dinner whenever they want.	1	2	3	4	5
b. Your never know who will be home for dinner in my family.	1	2	3	4	5
c. In my family, dinnertime is more than just a meal; it is a special time.	1	2	3	4	5
d. In my family everyone has a specific job or task to do at dinnertime.	1	2	3	4	5
e. In my family we eat together regularly.	1	2	3	4	5
f. In my family we have a special family food night when we order "take out" food like pizza or go to a restaurant together.	1	2	3	4	5
g. In my family it is important that the family eats at least one meal together each day.	1	2	3	4	5
h. I enjoy eating meals with my family.	1	2	3	4	5
i. In my family, eating brings people together in an enjoyable way.	1	2	3	4	5
j. In my family, mealtime is a time for talking with other family members.	1	2	3	4	5

Read:	Then Read: Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
k. Mealtime has often been a time when people argue in my family.	1	2	3	4	5

58. How many times a week do you eat out? ________

59. How many times a week do you purchase meals and bring them home? _______

SOCIODEMOGRAPHICS SECTION

Finally, we would like to ask you a few questions about your background.

60. How old are you? _________

61. Gender (Interviewer may determine this)

    1. Male
    2. Female

62. What is your ethnic origin? ________________________________

63. How much education have you completed?

    1. some grammar school
    2. completed grammar school
    3. some high school
    4. graduated high school
    5. some college
    6. college graduate
    7. some graduate school
    8. completed graduate school

64. Are you currently:

    1. married
    2. widowed
    3. divorced
    4. separated
    5. never married
    6. refused

THANK YOU FOR YOUR HELP WITH OUR STUDY.

APPENDIX J

DIET RECORD FORM

DIET RECORD

SUBJECT NAME: ____________________ DATE: ______________________
SUBJECT ID #: _______________________ DAY: _______________________

Instructions:
Write down everything you eat and drink today. Please include how much you ate or drank, where the food or drink was consumed, and who was with you when you consumed the food or beverage. Also, tell us if the food or drink was a meal or a snack. A snack is any food or beverage not eaten with a regular meal.

Time	Food/Beverage Eaten and Method of Preparation	Amount (How Much)	Where Eaten	Who Was With You	Meal (M) or Snack (S)

APPENDIX K

ANTHROPOMETRIC FORM

ANTHROPOMETRIC ASSESSMENT

INTERVIEWER NAME: ______________________

Subject Name:________________________

Subject ID#: _________________________

Age: _________

Sex: ____ Female ____Male

1. Body height _______________in. (nearest 1/8 inch)
   (without shoes and not leaning against wall)

2. Body weight _______________lbs.
   (without shoes)

3. Mid-arm circumference ____________cm.

4. Triceps skinfold thickness _____ _____ _____ = Avg. _____mm.

5. Subscapular skinfold thickness _____ _____ _____ = Avg. _____mm.

6. Waist circumference ______________cm.

7. Hip circumference ________________cm.

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