

“Who’s at the Table and Why Does It Matter? The Relationship Between Family Meals and Adolescent Diets” A Resource Document

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There is some argument as to when eating with family members came to be seen as a important ritual in the US and Europe. However, by the end of the 19th century, this event became an ideal and has remained so ever since (Gillis, 1996).

Research by Bossard on family rituas in the US first appeared in 1948. Bossard and Boll (1950) studied both autobiographies written from 1870 till 1930 and administered questionnaires to university freshmen. They defined a family ritual as one the occurred with regularity, was perceived as important, and family members were expected to take part in. Both approaches generated similar lists of important family rituals. The most frequently mentioned of these was family dinner. In the 1980’s the idea of family rituals was employed by family psychologists in their attempts to identify features of family life that provided some degree of protection from stress (Fiese, 1996).

Anthropologists and sociologists have investigated family meals in terms of their potential for producing family integration and solidarity as well as providing a daily means of socializing children. The most recent literature has identified family meals as a mechanism for preventing deviant behavior in adolescents.

Trends and Perceptions of Family Meals

Based on our time diary data, over 80% of mothers, fathers, and their children ate dinner with their families on a daily basis (see Table 1). Less than 5% of the children reported eating this meal alone or with friends. We also found children were more likely to eat dinner with their families if they believed it is important to do so and children thought this activity was important if their mothers thought so as well and if their mothers planned meals to fit family members’ schedules.

Table 1. Percent of Fathers, Mothers, and Children Eating Meals at Home and the Amount of Time Spent in Those Activities

Family member and event	% engaged in	Mean time (min)	Range (min)
Father eats dinner at home	82.5	27.4	5.1-90.6
Mother eats dinner at home	84.5	28.3	9.9-105.0
Child eats dinner at home	92.9	23.5	3.3-81.0
Father eats dinner watching TV	10.9	36.3	15.0-106.1
Mother eats dinner watching TV	17.1	26.7	10.1-104.9

Source: McIntosh et al. 2006

Many have argued that when families eat dinner watching television at the same time, the essential advantages of family meals are lost. This appears to be the case for several reasons. Family meals generally take place with family members facing one another without distractions that might prevent interaction among participants.

Children, who believe it is important to eat dinner with their families, spent more time eating dinner at home, spend less time hanging out with their friends.

Mothers who plan meals have children who spend more time eating them and less time watching TV. Mothers who prefer easy to prepare meals or who report when they get home at night, they are too tired to cook much of a meal have children who spend more time on a computer. Fathers also influence family meals. Will elaborate on this. Parenting style by each parent also important.

Meals with family are a central feature in family rituals.

The family meal has received a great deal of attention of late in the nutrition literature but social scientists have had an interest in family meals for a number of decades. One particular interest lies with family rituals, which are thought to provide families with an identity and a sense of importance.

Over the last 50 years, researchers have argued that family rituals increase family member's well-being. Recent observes describe the family ritual as a means of providing order to family behavior (Shor, 2003). Finally, rituals involve hierarchy and participation in those events reinforces these social arrangements (Ochs and Taylor, 1992). More recently, a distinction was made between family routines and family rituals in the context of family meals. Mealtimes

routines include instrumental communication, adherence to “the task at hand” – eating together, and continuity in terms of seating arrangements (Fiese, 2006). Furthermore, meal routines “focus on the direct exchange of information, ritual elements focus on problem-solving, discussion of sensitive topics, and the affective climate”(Fiese, 2006:69). Others have described family meals as sites of “socialization into competent and appropriate members of a society” (Ochs and Shohet, 2006). Empirical studies of family meals as rituals have focused on family member perceptions of dinners as special family times and as regularly scheduled activities in which family members are expected to participate (McIntosh et al., 2008; 2010); more qualitative work such as that of Ochs finds structure, particularly in terms of a hierarchy based on gender and age.

Marjorie DeVault (1991) takes an even stronger stand in this regard, arguing that the family meal is the means by which a collection of biologically related individuals, sharing the same household, come to define themselves as family and come to see their membership as important.

Family meals have become a touchstone for not only children’s well being but also the fate of the family itself. Some have argued that it is disappearing (Murcott, 1997) and others have identified barriers to successful family meals (Fulkerson et al., 2006). However, Jackson et al. (2009) assert that concerns about the decline of family meals constitutes a “moral panic” and family time at meals ‘has remained remarkably stable over the past 30 years; looking at historical data, can claim stability over the past 100 years. Furthermore, the symbolic status of the family meal remains intact. What has changed appears to be the percentage of these meals consumed away from home.

Functions of Family Meals

Researchers have long viewed family meals as events during which as a routine opportunities for social interactions, coordination of future family activities, information sharing, and the shaping of identities takes place (McIntosh, 1996). Socialization takes place as well, with some of the focus dealing with table manners and eating habits, but in addition dealing with more general values, norms and beliefs (Lewis and Feiring, 1982; McIntosh, 1996). Some years ago researchers observed that issues of rule violation and issues of discipline with frequent dinner time conversation topics in families with children (Dryer and Dryer, 1973).

The Dark Side of Family Meals

Not all family meals meet with the ideals of family meals as described by Bossard (1948) and others. Bossard himself acknowledged that in some families, individuals found family meals oppressive. As already noted, not all table talk is pleasant; so unpleasant that even as adults, many continue to have negative memories of eating with their families (Hinton et al., 1963; Lupton, 1996). Others have found that not all of those in lower class households perceived value in family member interaction during meals (Charles and Kerr, 1988).

So How Do Family Rituals Increase Participation in Meals

We and others measure family meal rituals using a scale of items that tap the specialness of eating dinner with family, having regularly scheduled dinners, having most family members participate in this meal on a frequent basis, and perceived importance of eating together as a

family. We ask these questions of each family member participating in our study and their answers are highly correlated. Equally important, mothers, fathers, and children's perception that dinner is an important family member increased the likelihood that children think it is important that they eat dinner with their family and the frequency they eat dinner with their families (McIntosh et al., 2010b). Mothers who plan dinners in advance are more likely to view dinner in these terms and as consequence devote more time to preparing dinner (McIntosh et al., 2010b).

We thus face various claims about the health of family meals, their value to participants particularly children, but we know little about why children participate in them. Neumark-Sztainer et al. (2000: 329) found from focus group study that parent and teen schedules, teen desire for autonomy, dissatisfaction with family relations and dislike of the food served at family P. 11 meals" were things that led to lower participation. 2000:329. But this literature describes only half of the story; it tells us little about why children are motivated to participate in dinner in the first place.

Some recent work provides hints. To begin with, family meal participation by teen agers increased from 1996 till 2007 (National Center on Addiction and Substance Abuse, 2007). These researchers also found that 84% of their respondents preferred eating dinner with their families to eating alone. Teens in this study perceived that "the best time to talk to their parents about something important to them was during or after dinner..." Ironically, 'functionalists' in sociology used to describe communication and information-sharing as key functions of family meals (see McIntosh, 1996). Results of a study by Olsen and Ruiz (2008) suggest that children's participation in decisions about what foods are served during family meals may affect their participation in those meals. Suggest that children receive "reward power" from having their food choices considered increasingly the likelihood they participate in meals in which their choices are served.

In addition, the frequency with which children eat dinner with their families is influenced by age and socioeconomic status of the family. Research by Tarveras et al. (2005) found younger children ate dinner more frequently with some family than older children; similarly Neumark-Sztainer et al. (2003) found that high-school aged students ate fewer times a week with their families than middle school aged students. Some report that children in families who are close to the poverty line ate dinner with family more frequently than children from families well-above the poverty line (Child Trends, 2006); similarly Neumark-Sztainer (2003) found that children from families of low socioeconomic status reported eating with family more times a week than children from families of upper middle or high SES.

What Influences Parents Eating at Home?

Our own data indicate that working mothers spent less time eating breakfast and lunch at home; the higher the income of the working mothers, the less time spent in these two activities. The remainder of the work-related effects resulted from work schedules. Flexible work hours permitted more time for preparing breakfast and dinner and eating breakfast and lunch for mothers. Working mothers who experienced greater job stress or work-to-family spillover spent less time eating lunch at home. Fathers eating at home at breakfast, lunch and dinner times depended on both parents having flexible work hours. Fathers who experienced less control over their work spent more time eating breakfast away from home. Higher income earned by fathers led to more time spent eating lunch and dinner away from home and less time eating dinner at home. Fathers spent more time eating dinner away from home if both they and their spouses had standard work schedules; they spent less time eating lunch away from home if

they had a non-standard work schedule. Mothers spent more time buying takeout food if they and their husbands had less standard work hours. Fathers spent more time buying fast food if both parents lacked flexible work hours or their spouses lacked work control.

Children spent more time eating dinner at home if they believed it was important to eat with their families. Mothers who believed that eating dinner with family was important had spouses who spent more time doing so; fathers who believed in this ritual had spouses who spent more time eating dinner. Fathers work time and mothers time commuting reduced father's perception that dinner was an important family event.

What interferes with family meals and rituals? Children were less likely to perceive dinner with family as important family ritual if they either spent more time with their friends or talking with their friends. Other interferences with family meals were time spent in the car running errands and watching TV.

Dinner Rituals and Time Use

Husbands who believed dinner was an important family rituals had spouses who spent more time preparing dinner, ate dinner at home more frequently and dinner away from home less so. Mothers who believed dinner was such a ritual spent more time preparing dinner. Fathers who spent more time eating dinner at home were less likely to have overweight children.

The more time that mothers and fathers spent working or commuting, the less they perceived dinner as an important ritual. The same was found for mothers who spent more time watching TV. Children who perceived dinner as an important ritual spent more time eating dinner at home, but if they spent more time with their friends or working, the less they saw dinner in these terms.

Children who spent more time interacting with friends or grocery shopping with them consume poorer diets in terms of percent calories from fat.

Creating the Family Meal and Getting Children to the Table

The above research can be thought of as reflecting "demand side factors" influencing children's participation in family dinners; absent from this account are factors that affect the "supply" of such meals. Here we turn to another research program, which suggests mothers take family meals seriously, because in DeVault's (1991:39) words "family meals construct family." DeVault (1991) argues that women are socialized to take on what she refers to as the "gendered work of caring;" having learned that the production of a "family" as a socially organized entity requires particular kinds of coordinative and maintenance activities. The DeVault research adds an important leg to our research, namely, that developing meals that create the sense of family take work on the part of mothers/wives. Recently Moisio, Arnould & Price (2004) have argued these efforts sometimes include homemade or made from scratch meals. Thus, mothers who perceive this important role of meals in constructing and maintaining 'family' are more likely to engage in those things that make family meals possible, including meal planning. Fiese et al. (2006) observe that such planning is key to regularly scheduled meals that family members believe are important to participation in. Missing from the DeVault and Fiese et al. accounts is the degree of success that such work and planning has in getting children to participate in these family-defining events. However, two things are evident from DeVault's (1991:228) discussion: 1) that those who attempt to produce family by cooking "often

feel as though their efforts fall short of their plans, and worried they might not be doing enough” and 2) producing family involves creating multiple food events based on individual family members’ (both spouses and children) schedules and competing activities.

Other literature illustrates these difficulties finding some women engage in “haphazard planning” (Schlundt, Hargreaves & Bechowski 2003;) while others found women using a “reactive timestyle” – feeling they had no control over their time and thus dealing with dinner when the time arose (Jabs, Devine, Bisogni, Farrell, Jastran & Wethington, 2007). Some have suggested that such women’s ‘poor’ planning is due to their employment outside the home. Time pressures and poor planning may result in use of convenience foods; income constraints may constrain food purchase choices. The results of these various constraints may lessen the importance of the family meal and children’s willingness to participate in meals. Tradeoffs are often made by low income mothers. While convenience foods are more expensive they greatly reduce preparation time (Rose, 2007).

Mothers’ work outside the home has received a great deal of scrutiny by researchers interested how much time mothers spend performing household chores, including cooking (Bianchi et al., 2006; Manchino and Newman, 2007) to those interested in how much time working mothers spend with their children compared with non-employed mothers. The research indicates that working mothers spend as much or more time with their children in so-called primary activities (activities that directly involve the child), but spend less time in household chores and less time eating. At the same time, Neumark-Sztainer et al. (2003) found no relationship between mothers’ employment status and number of times children reported eating dinner with their families. However, some report both income and employment outside the home reduce the amount of time women spend cooking (Manchino & Newman, 2007). For this reason we have included mothers’ work in the model. Other constraints/influences on shopping for food and preparing meals include time pressures, food budget constraints, and use of convenience foods, finding time constraints often led to the purchase of convenience foods (Bava et al. 2008).

The Importance of Fathers and Family Meals

Fathers’ time spent working had no impact on the frequency with which their children ate dinner with the family; however, the more time that fathers devoted to their work, the more important children believed it is to eat with their families. By contrast, the more time fathers spent doing chores around the house, the less important their children thought it was to eat with the family and the less frequently they did so. The more time that both mothers and fathers spent watching TV, the less important eating dinner with family was to their children. The more time mothers spent preparing food, the more frequently children ate dinner with family.

The more time that mothers spent eating dinner at home, the more time their children did as well. The more time that mothers and fathers spent eating dinner away from home, the more time their children did as well. Mothers’ time spent watching TV was associated with children spending less time eating dinner at home. Fathers’ time watching TV was positively associated with the amount of time children spent eating dinner at home.

Fathers’ time spent in both full service and fast food restaurants were positively associated with the time their children spent eating in these places, respectively.

Nutrition Findings

A primary means by which diet quality is modified by participation in family meals is through foods available to the family as compared to those selected if the meal were eaten by the adolescent alone, with peers, etc. This perception was shared by focus groups of adolescents in Minnesota who indicated that they considered foods eaten in family meals to be healthier than foods that they would have eaten alone or with friends (D. Neumark-Sztainer, Story M., Ackard D, Moe J, Perry C, 2000). Another study supported this concept when other adolescents stated that they thought that their diets would improve if they ate more meals with the family (D. Neumark-Sztainer, Story M., Ackard D, Moe J, Perry C, 2000). These reports were part of Project EAT (Eating among Teens), an investigation with data collected from young adolescents and older teens in 31 public schools in urban Minnesota. A 2003 report indicated that dietary quality of teens who ate more family meals was healthier than were diets of those who reported fewer family meals (D. Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003). More nutrient-dense foods, including fruits, vegetables, total grains and foods high in calcium, were eaten by teens who reported having more frequent family meals. Their intake of soft drinks also was lower; but intake of key nutrients, such as calcium, iron and folate, was higher.

More than 16,000 children ages 9 to 14 years whose parent was a participant in the Nurses' Health Study II were recruited for the Growing Up Today Study (GUTS). Gillman (Gillman, et al., 2000) reported that, as frequency of eating family dinner increased from never to most days or every day compared to most days, likelihood of eating at least 5 servings of fruits and vegetables increased while eating fried foods away from home and drinking soda decreased. In a project using data from the National Longitudinal Study of Adolescent Health (Add Health), intake of more fruits, vegetables, total grains and foods high in calcium was reported by teens who were more likely to eat dinner with a parent than those who were less likely. From this study, Videon (Videon & Manning, 2003) suggested that the value of parents being present at the meal in part may be the opportunity presented to provide healthy food choices but also to model healthy eating. Eating family meals was inversely related to skipping breakfast by Add Health subjects.

Modeling as a key to the value of family meals was supported by data from a Project Eat report from Arcan (Arcan, 2007). Intake of dairy, vegetables and fruits by parents at baseline was predictive of intake of these foods by teens in a 5-year follow-up. Robinson-O'Brien (2009) noted that family meal frequency along with an accessible supply of fruits and vegetables in the home and encouragement by parents to eat them, explained 27% of variance of intake of fruits and vegetables by children in a recent study in Minnesota. A 5-year follow-up of Project EAT participants by Burgess-Champoux (Burgess-Champoux, Larson, Neumark-Sztainer, Hannan, & Story, 2009) revealed that those who had regular family meals at baseline and 5-year follow-up consumed healthier diets than those who did not have regular family meals. These teens were more likely to consume breakfast and dinner and had increased intakes of vegetables, calcium-rich foods and some nutrients. Healthier food choices and meal patterns also have been reported to track from adolescence to young adulthood (Lien, Lytle, Klepp, 2001); and Larson (Larson, Neumark-Sztainer, Hannan, & Story, 2007) suggested that such tracking could be attributable to dietary behaviors established at family meals during adolescence. Being accustomed to family meals, that is, structured eating opportunities with others, may lead to a continuation of more routine meals and more social eating. Data from a study that included more than 1,700 young adults who had been part of Project Eat indicated that those who took time to have structured meals with other people had better dietary intakes than those who instead had meals on the run (Lien, Lytle, Klepp, 2001; Larson, Nelson, Neumark-Sztainer, Story, & Hannan, 2009).

The conclusion from these studies is that frequency of family meals has a significant impact on dietary quality of children and adolescents that continues as they reach older adolescence and young adulthood.

Results of dietary intake by participation in family meals from our study vary from those of other studies. Differences in nutrient and energy intake by frequency of family dinner were not found. However, of those who reported more family dinners, boys were less likely to snack while girls were less likely to skip breakfast. Snacking per se is not a problem for adolescents, since snacks are needed to meet energy and nutrient needs during periods of rapid growth. Rather it is the potential for selection of less healthy foods available in so many locations, such as vending machines, convenience stores, etc., that is of concern. Participation in family breakfasts was also positively associated with less snacking by children ages 9-11 and more use of vitamin-mineral supplements by boys in both age groups. Gillman (Gillman, et al., 2000) reported a higher use of multivitamins by GUTS subjects who ate dinner with family on a daily basis. Supplement use could indicate more concern about nutrition and health in these children. Family meals as sites for conversation about nutrition and food has been suggested by some authors (Neumark-Sztainer, 2006).

Family lunches is a topic that has been the focus of few reports. Results from our study indicate that this is a meal that may have effects that vary considerably from those of breakfast or dinner eaten with family. Children in our study who ate more family lunches had a lower percentage of kilocalories as carbohydrate but higher intakes of sodium, cholesterol and iron (% DRI). Adolescents who reported more family lunches also reported intakes that were higher in fat as a percentage of energy but lower in dietary fiber (% DRI). Increased iron suggests a higher intake of meat, as does cholesterol, a substance found only in foods of animal origin. Lower carbohydrate could be beneficial if a lower level of refined grains and simple sugars occurred or not beneficial if it is indicative of less whole grains, vegetables and fruits. Dietary intakes of female participants who reported eating more family lunches were higher in total energy, as well as kcal/kg body weight, and contained more cholesterol, saturated fat and sodium. On a more positive note, they also consumed a higher percentage of the DRI for iron and dietary fiber. Perhaps family lunches in our population consisted of more total food than lunches eaten alone or with non-family members and/or included foods that are less healthy (higher energy density) than foods at other meals. On the other hand, subjects who had more family lunches may have eaten differently at other times as well.

In comparison to family dinners, family lunches, which occur in the middle of the day's activities, could be subject to more time constraints thus affecting time available for planning, preparation and consumption. Consequently, foods chosen to be a part of family lunches could include more pre-prepared foods and items, such as deli-type sandwiches, which could be higher in fat and energy than the kinds of foods selected for family dinners. Analysis of foods reported by our subjects will include food use by meal occasion.

Foods eaten as a part of school lunches and others available in schools but not part of the School Lunch Program, i.e., competitive foods, are familiar to students and may be preferred as a part of lunches at home. These competitive foods in vending machines and other locations were available in 98% of high schools in the Third School Nutrition Dietary Assessment Study (SNDA-3). This study assessed dietary quality of lunches and breakfasts offered through the U.S. Department of Agriculture National School Lunch Program (NSL) and School Breakfast Program in all participating schools (Gordon, Crepinsek, Briefel, Clark, & Fox, 2009). Results indicated that fat and sodium content was too high, and offerings of vegetables and fruits (especially in a fresh form) and whole grains should increase (Story, 2009). Almost all NSL lunches exceeded the recommendation for sodium, while only 60% of lunches met the standard

for total fat (Crepinsek, Gordon, McKinney, Condon, & Wilson, 2009). On the other hand, Hastert and Babey (2009) reported on data from more than 2,700 adolescents in the 2005 California Health Interview Survey. Results showed that those who brought lunch to school from home 5 days per week ate more fruit and vegetables but fewer fried potatoes, high-sugar foods and sodas and fast food than those who did not bring their lunch to school. Unfortunately, our subjects were not asked about the source of foods eaten for lunch at school.

Increased frequency of family dinners by our participants of both genders and age groups was associated with reports of higher self esteem. More frequent consumption of family breakfasts was associated with fewer girls from both age groups reporting current dieting while male and female children rated their physical activity level as being higher than those of their peers, which differed from the rating by those who ate fewer family breakfasts.

Children ages 9-11 who ate lunch with family more often were less likely to be dieting at that time but were more likely to have a BMI categorized as overweight. Eating family lunches was inversely related to involvement in hard exercise by all participants. Of interest is that adolescent males in this more frequent family lunch category indicated less likelihood that mom and dad were concerned about their weight or that they were dieting at that time. Boys who ate fewer family lunches had lower BMI's and were less likely to be overweight. However, these subjects had higher subscapular skinfolds, indicating the presence of more subcutaneous fat, perhaps related to the stage of the adolescent growth spurt.

What and how much children eat at family meals certainly is dependent upon the selection and quantity of foods available. Consideration also is given to the overall environment of the meal, which can affect intake greatly. Behaviors or actions by parents at meals probably start with modeling but extend far beyond. Orrell-Valente (Orrell-Valente, 2007) reported on influence of parental prompts to eat more or less on intake of children. Although the overall goal of parents in this study with kindergarten-age children and parents seemed to be to increase food intake by their children, mothers used encouragement for their daughters while fathers used pressure tactics with their sons to increase their intake. Since the prompts to which children responded most were neutral, the effect of other types of prompts on the overall atmosphere of the meal would be of interest. Food restriction was a focal point for few parents in this 1987-88 study from which the authors suggested that food restriction techniques could be directed more toward snacks than foods at family meals.

Hendy (Hendy, Williams, Camise, Eckman, & Hedemann, 2009) identified parental mealtime behaviors from a survey of parents of 2008 school aged children from 67 counties in Pennsylvania. Factor analysis yielded parental behaviors that were then tested with other groups of children and parents. Some behaviors were related to higher BMI in children. Specifically, mothers of the children with higher BMI's were more likely to restrict food because of concerns about the body weight of the child and also to model snacking between meals but less likely either to pressure or encourage the child to eat (authoritarian or authoritative parenting style, respectively). Hendy's study provides additional evidence of the ability of the atmosphere of the meal to modify intake of the child.

Consequently, a conclusion about the influence of family meals on development or prevention of obesity perhaps should be based on more than frequency of the event; and meal environment provides one reason for the variation in findings among studies on dietary quality, obesity and other outcome. For example, data from the NLSY97 were used by Sen (Sen, 2006) to assess the relationship between frequency of family dinner (FFD) during the past year and BMI, as well as the odds of change in overweight status three years later. Results indicated that in white subjects higher FFD was associated with lower odds of being overweight and becoming

overweight with an increased likelihood of ceasing to be overweight by 2000. No such relationships were noted in blacks or Hispanics. In a study assessing the relationship between health behaviors and overweight in students who attend alternative high schools in Minnesota (n=145), the absence of family meals was more likely to be reported by overweight students than by those of normal weight (Kubik, 2009). An evaluation of NLSY97 data by (Price, 2009) revealed that frequency of family meals was inversely related to BMI percentile over time. On the other hand, Traveras (Taveras, Rifas-Shiman, Berkey, Rockett, Field, Frazier, Colditz, Gillman, 2005) noted that frequency of family dinner by GUTS subjects was inversely related to overweight at that time but not longitudinally. Although the relationship between frequency of family meals and overweight was significant for young adolescent females (Project EAT-II), no influence on overweight in older females (mid-adolescence and young adulthood) or males of any age was reported (Fulkerson, Neumark-Sztainer, Hannan, & Story, 2008). These authors emphasized that the development of obesity is far more complex than just the presence or absence of frequent family meals.

If family meals are perceived to be rituals, then they are important to family members and serve to develop togetherness and family unity. This perhaps is illustrated by the finding in our study that children who considered family meals a ritual spent less time eating alone. Influence of the family on dietary intake and other dietary behaviors of family members could be stronger than if these meals were considered to be routine, as described by Fiese (2006) as a time for re-fueling. Indeed differences were noted between our subjects who did and did not perceive family meals as a ritual. Of those who thought of family meals as rituals, all children reported consuming more calories, males in both age groups had higher protein intakes and girls ages 9-11 reported a higher cholesterol intake than those who did not have this perception. Perhaps being with family encouraged more food consumption in these groups. Females in both age groups and adolescents in the "ritual" group were less likely to skip breakfast. Adolescents of both genders reported less snacking and consumption of fewer calories than those who did not perceive family meals as rituals. These dietary behaviors have a favorable effect on health now and perhaps in the future (Larson, et al., 2007; Lien, Lytle, & Klepp, 2001) (Larson, et al., 2009). In addition, perception of family meals as rituals was directly related to higher self esteem by girls ages 9-11 and all adolescents.

The potential for an effect on body weight exists as evidenced by a positive relationship between perception of family meals as rituals and lower caloric intake and a lower likelihood of reporting a recent weight gain in adolescents. Adolescent males in the "ritual" group had higher subscapular skinfolds and were less physically mature, which indicates them to be in an early stage of pubescent growth in which fat stores accumulate in preparation for this rapid growth. As children develop physically, their attachment to parents weakens. Thus family meals become less important.

For males from both age groups perception of meals as rituals was directly related to a lower likelihood of reporting weight gain but a greater chance of participation in regular exercise and team sports. Those in the "ritual" group also considered themselves to be more active than their peers, and girls ages 9-11 in this group were more likely to be involved in team sports. Females from both age groups with a stronger perception of meals as rituals also thought that their mothers and fathers were less concerned about their weight than parents of other girls.

Watching television during family meals probably occurred when the first televisions were brought into homes. Meals likely were scheduled around TV programs or perhaps during programs that were family favorites. With the advent of the ability to record those programs the need to eat in front of the TV disappeared, but the desire on the part of many families continues. The influence of TV on dietary intake is of concern, and the need for conversation decreases as

the people on the screen talk and entertain. The 2000 report from Project EAT by Neumark-Sztainer (Neumark-Sztainer, D., Story M., Ackard D, Moe J, Perry C, 2000b) from focus groups of adolescents included frequent statements by group members, indicating that their families gathered in front of the TV for family meals while other teens stated that they ate meals while watching TV by themselves. In 1996, Gortmaker (Gortmaker, 1996) indicated that television viewing was associated with obesity in children. More recently, Gable (Gable, Chang, & Krull, 2007) monitored body weight in subjects in the national Early Childhood Longitudinal Study-Kindergarten Cohort (n=8,459) from entry into kindergarten to spring of third grade. Children who watched more TV and ate fewer family meals were at greater risk of being overweight by the end of third grade. A combination of these two factors would be predicted to promote weight gain.

Dietary intake by those who reported frequent TV watching during dinner has been reported to be poorer than those who watched less if any TV during family meals (Coon, 2001); (Befort, et al., 2006); Feldman, Eisenberg, Neumark-Sztainer, Story, 2007). The New York State Special Supplemental Nutrition Program for Women, Infants, and Children was the source of 1336 adults who were surveyed about their child-feeding practices (Fitzpatrick, Edmunds, & Dennison, 2007). Although intake of milk, fruits and vegetables increased as number of family meals per week increased, watching TV during those meals as associated with less beneficial effects on intake of fruits and vegetables. Approximately 900 Project EAT subjects and their parents were surveyed about the family mealtime environment by Fulkerson (Fulkerson, et al., 2008). Both teens and parents indicated that television viewing was inversely related to frequency of family meals. Respondents perceived family meals as a time to talk, an activity with which television interferes.

In the Houston study television viewing during family dinner was associated with increased intake of cholesterol and sodium but less folate by male subjects and higher intakes of protein and cholesterol in females. Cholesterol is contained in animal products, including meat, poultry, fish, eggs and dairy products that contain butterfat. These are foods high in protein and other important nutrients, such as zinc, iron and B vitamins; but recommendations are to reduce intake of high fat products because of cholesterol and saturated fat. Sodium has been demonstrated to be associated with development and progression of hypertension, and moderation is recommended. Folate is a nutrient that is found in fruits, vegetables, whole grains and cereals along with enriched ones. Adolescents who watched more television during meals also reported less pressure from parents about food intake. Overall, more television viewing during family meals in these children and adolescents seemed to have a negative effect on dietary quality. Of interest is the fact that perception of family meals as a ritual by female subjects in our study was inversely related to the frequency of watching television during family dinner.

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Appendix. Description of Our Houston Study

Parental Time, Income, Role Strain, Coping, and Children's Diet and Nutrition Project 2006

Research Methods

A. Survey and Sampling

The data and results presented in this report derive from the "Parental Time, Role Strains, Coping, and Children's Diet and Nutrition" project. The data were collected between July, 2001 and June, 2002. The goal was to obtain data from one child between the ages of 9-11 or 13-15 and from both of that child's parents in dual headed households or from one child (same age categories as above) and from that child's mother (female headed households). It was decided that male-headed households are still too few to be of the same relevance as either dual headed or female-headed households.

The project aims to examine the potential influence parents have on children's diets and health outcomes. However, studying children under the age of 9 using complex survey instruments is problematic in terms of a child providing detailed data about themselves (Crocket and Peterson 1993). In addition, as children progress through adolescence, parental influence begins to wane as peers become an increasingly important source of influence (Crocket and Peterson 1993). Finally, we opted to exclude 12-year olds because this is the age at which many children undergo puberty; we desired a sample of pre-pubertal and post-pubertal children.

Random digit dialing was used to generate a sample of approximately 300 households in the Houston Metropolitan Statistical Area (MSA). A minimum of 212 households were needed in order to obtain statistical power of 90 percent at the .05 level (one-tailed tests) in bivariate analyses (Kraemer and Thielman 1987). Because we planned to test hypotheses using multivariate analysis techniques, a sample larger than 212 was necessary. In addition, we anticipated that given the amount of respondent burden required of study participants that a number of members of the participating households would not fully complete all parts of the data collection phases. Finally an effort was made at over-sampling female-headed households.

The Houston MSA was selected because of its high concentration of ethnic groups and range of incomes. The city of Houston is the fourth largest in the country. Appendix A gives more information on the sample.

B. Respondent Burden and Overview of Survey Instruments

The study required a complex set of data requirements from *each* participating household member. Six survey instruments were used in the collection of data. These can be grouped under three general headings:

- (1) Parent's telephone interview,
- (2) Parent's self-administered questionnaire with time diary,
- (3) Children's questionnaire, 24-hour dietary recall, 2-day diet record, and activity record.

This section describes the purpose of these instruments and how they were implemented. Appendix E contains the actual survey instruments.

1. Parent's Telephone Interview

Each parent was asked to participate in their own telephone interview separate from their spouse. Each parent's telephone interview lasted about 45 minutes and was designed to gather information about the employment status of the parent, parenting style, parental control over food and expenditures, parental feeding style, parental concern about children's eating habits, parental self-reported health and health behavior and children's health and family sociodemographics.

The parents were asked a standard battery of questions regarding employment that followed those used by the General Social Survey by Davis and Smith (1995). These questions were used to determine if the parent works, the type of work they do, and the work schedule they have. The telephone interview also included questions regarding the importance of the parent's work to them and their work commitment. The parents were asked about the degree of flexibility or flextime available to them and the amount of overtime they worked. Parents were also asked about whether they experienced job stress and/or work-family role conflict.

The parent telephone interview also included standard questions used for obtaining information about who in the household was more responsible for household tasks such as grocery shopping, meal preparation and cleanup, childcare and other household tasks.

2. Parent's Self-administered Questionnaire with Time Diary

Each parent was asked to complete a self-administered questionnaire and time diary separate from their spouse. The questionnaire and time diary were reviewed with the parents in the home by the field interviewer, who interviewed the child. The survey instrument was left with the parents to be mailed back after completion.

The parent's self-administered questionnaire was designed to obtain both sociological and economic information from the household. With regard to the sociological aspects of the self-administered questionnaire, we asked the parents to tell us how they dealt with the discipline of their children. They were given specific violations or rules and asked to circle which of the discipline methods provided were used for each of the cases mentioned. With regard to the economic aspect of the self-administered questionnaire, we asked parents about their sources of income. We asked parents to provide information about their sources of earned income such as wages, salaries, commissions etc., as well as their sources of unearned income such as investment incomes, rental income, interest, et cetera. Parents were encouraged to consult financial records (e.g., tax returns, receipts, checkbook records, etc...) in completing the

financial aspects of the questionnaire. The self-administered questionnaire also contained a section that asked questions about the type of family financial structure of the household. The type of family financial structure has been found by both the sociological and economic literature to have different effects on household purchases (e.g., Pahl 1989). Different financial structures have been found to lead to different degrees of autonomy in purchasing decisions. Parents were also asked about the household's expenditure patterns. Parents were not only asked about the monthly expenditures in a variety of different categories, but also who is in charge of making the monthly expenditure in each of the expenditure categories.

The last section of the self-administered questionnaire was the time diary. The time diary was designed to measure how the individual parents used time in a given day. One of the theses of the project is that as parents' lives become more hectic, they look for ways to save time, especially for time consuming activities, such as meal preparation and clean up and child care. In theory, there are three ways in which a parent can save time. First, there is multitasking whereby someone does more than one job at a time. Second, in a household with many members, household members can work together to get a job done in less time. Third, time can essentially be bought which means that resources can be used to purchase goods and services in the market to reduce the amount of time it takes to carry out household chores. We asked each parent in a household to keep his/her own time diary because of the substitution possibilities of time between household members. Parents were asked to keep track of all of their activities during a 48-hour period corresponding to their children's dietary and activity recall. They were provided with an example of how to fill out the time diary. They were asked to enter the first thing they did each day, the beginning and ending times of the activity, whether or not they were doing something else at the same time, where the activity took place and whether or not someone helped them. The parents were asked to repeat this process for all of their activities during a day until they completed their last activity of the day.

Each individual recorded what he or she did throughout the day and each entry was coded as one primary activity per row in the data set. Occasionally, the individual might report doing two or more activities at the same time, such as cooking while listening to music. In this case, the primary activity was considered to be the one that engaged the most attention and the others were recorded as secondary activities in the same row. Therefore, for the one-day time diary record, each individual had the same number of rows of time diary records in the data set as the number of primary activities he or she participated in throughout the day. All activities were assigned codes and there are a total of 208 activities for fathers and 224 for mothers. These activities were then grouped into 18 major categories: work, travel, food consumption at home, food consumption away from home, food preparation, other food related activities (such as grocery shopping), care for household member other than child, personal care, shopping, education, voluntary or other unpaid work, entertainment, exercise, hobby, media (listening to music), talk, party, cleaning. In our sample, there were only four fathers and eight mothers who completed only one-day of the time diary, all others provided complete two-day records.

3. Children's Questionnaire, 24-hour Dietary Recall, 2-day Diet and Activity Record

Children between age 9-11 and 13-15 were used in this study because research in the nutrition literature suggests that, on average, age 12 is a time of great change because of puberty. The participating child in each family went through a personal interview, a 24-hour food recall, a 24-hour activity recall, anthropometric measurements such as sub-scapular and triceps skinfold thicknesses, waist and hip circumference, height, weight and a self-assessment

of the Tanner scale. The children were also instructed on how to fill out food and activity diaries for two days.

The children's interview took place at the child's home or in rare cases at a public facility or private home of the parents' choosing. The child interview took anywhere from 45 minutes to 1 hour and 45 minutes. The time depended on the child's age, concentration and level of maturity. The longest interviews were those of 9-year-old boys. The child questionnaire mimicked the parent's telephone interview in many respects and included sections on relationships with parents, parenting styles, the children's health behavior, perceptions of body satisfaction and self-esteem, family meal rituals, parental criticism of children's weight and exercise, children's work for pay and expenditures, sociodemographics and children's dietary behavior.

Children's dietary behavior was an important area of concentration. The children's questionnaire included questions about the frequency that children/adolescents reported skipping meals, how often they ate dinner with at least one parent, and how often they ate in restaurants, fast food restaurants, at school or in another child-care setting. The children's questionnaire also included a 30-item scale developed by Devereux, Broffenbrenner, and Suci (1962) that was used to measure the dimension of parental warmth and involvement that parents have in their children's life, the presence of clear behavioral standards and child involvement in decisions that affect him/her. The questions utilized a Likert 5-point scale.

The purpose of the 24-hour diet recall was to ascertain the nutrient intake of the child in the previous 24-hour period. Dietary intake was measured using the multipass 24-hour recall. With the 24-recall method, participants first provided a free-recall list of all foods consumed within the 24-hour period prior to the appointment. This was followed by structured prompts from the field interviewer regarding food descriptions and amounts and a final review of the recall information to obtain any changes/additions the child might want to make.

During the 24-hour recall, intake data collection was aided by a food model book, (adapted from Hess, 1997) measurement cups and a ruler, and the child was asked to indicate the amount of food or drink he/she consumed. The child was then asked where they consumed the food or drink. The child was asked to indicate if anyone was with them when they consumed the food or drink and finally they were asked whether they consider the food or drink consumed to be a meal or a snack. This process was repeated for all of the food or drinks consumed during the 24-hour period.

The 24-hour dietary recall was supplemented by a 2-day food record. One weekday and one weekend were randomly selected during either the summer or school year depending on when the interview was collected. The two days selected for keeping the food records were selected based on the date of the interview. The day after the final food record day, an interviewer called the participating child by telephone and asked the child to read his/her record entries. In cases in which the food items or amounts eaten were unclear, the interviewer probed for more details (see Casey et al. 1999). Data from the 24-hour dietary recall and 2-day food records were entered into a software program called Food Processor for conversion into nutrient intake values (ESHA Research 2000-2003).

The Tanner scale was used to determine the growth and sexual development of the child interviewed. According to Daniels et al. (1999) sexual maturity is a more important determinant of body fat than age. The amount of vitamins and minerals needed by children and adolescents depends, in part, on their stage of growth and sexual development or puberty. The Tanner scale was composed of a series of drawings of children at various stages of puberty.

The female drawings show different degrees of breast development and pubic hair growth. In order to reduce embarrassment for the participating children, they were given an envelope containing the sex-appropriate Tanner drawings and were asked to go to another room in order to circle the appropriate level of development represented by the various choices offered. Once they had completed this task, they returned the envelope (with the drawings placed inside) to the interviewer.

The purpose of the 24-hour activity record was to ascertain the amount of inactivity of children. The 24-hour activity record provided information about the activities undertaken by a child in the previous 24-hour period. The child first told the interviewer at what time the child went to bed the previous day, where the child went to bed, was anyone with the child when he/she went to bed and for how long they slept. The child was then asked at what time they woke up, where they were, was any one with them, and how long it took them to wake up. The process then continued by asking the child at what time the next activity took place, what was their next activity, was anyone with them while they performed this activity, and how long the activity lasted. This process was repeated until the child reported going to sleep.

Height, weight, waist and hip circumferences, and triceps and subscapular skinfolds were obtained by the interviewers in accordance with procedures provided by Lohman, Roche, and Martorell (1988). Before the interviewers were allowed into the field, they trained to be able to take three measures that did not differ by more than one-centimeter. In the field, participating children were asked to wear lightweight and loose-fitting clothing for their physical examination. The children's shoes were removed prior to measuring their heights. BMI was calculated from the children's weights and heights.

Height was measured to the nearest 1/8 inch using a non-stretchable metal tape measure and a metal triangle while the subject was wearing lightweight clothing, no shoes, and standing on a non-carpeted surface. Weight was measured to the nearest .5 pound using a 12" by 12" 500 pound parcel scale (Scales Plus, Collierville, TN).

Waist circumference was measured to the nearest 0.1 cm at the narrowest area below the rib cage and above the navel (or at the navel if there was no narrow section) using a flexible nylon tape measure. Hip (buttocks) circumference was measured around only the undergarment layer while the child was standing. The waist-to-hip ratio is a measure of fat deposition; a higher ratio is associated with greater central adiposity and possibly greater visceral adiposity.

Triceps and subscapular skinfold measurements were taken on the right hand side and were done in triplicate to the nearest millimeter using a Lange Skinfold Caliper (Cambridge Scientific Instruments, Cambridge, MD). The three measures were then averaged.

Finally, all questionnaires were also translated into Spanish for those who preferred to be interviewed in Spanish.

4. Respondent Incentives and Compensation

Based on our pilot study experiences, we found that in order to maximize a completed study of each household, the mother, father, and child must participate in the study. Without an incentive paid to each participant the likelihood of losing one or more household members was high. The use of incentives in household studies in which the respondent burden is high has precedent; the Iowa Youth and Family Study required that each sampled household must

contain a mother, father, and two children who were willing to participate before the household was deemed eligible to participate (Conger and Elder, 1994). In that study, the participating subjects each received \$20 per hour of participation. Based on differential respondent burden (based on the number of questions asked and the amount of time on average to participate in the study), we paid each participating child \$25; each mother \$20; each father \$15. We also held a lottery at the end of the data collection period in which two participating household were selected at random to receive \$250 each. Each household also received a summary report of the child's nutrient intake.

C. Measurements of Variables of Interest for This Report

The data collection process described in the previous section resulted in an extensive and very rich dataset whose complete analysis is far beyond the scope of any single report. For this report, we focus on the variables described earlier and listed in Table 3. Table 5 gives all the variable names, the units, and their definition that will be the focus of this report. This section describes how these variables were constructed.

Nutrient Intake and Anthropometric Outcome Data: As indicated, dietary intake was obtained through collection of food intake data over a three-day period. A multiple-pass 24-hour recall for the day prior to the interview was obtained using a 2-dimensional booklet of food models to assist in estimating portion sizes. The booklet consisted of photographs of representative foods, drawn from Portion Photos of Popular Foods (Hess 1997) and used by permission of the *American Dietetic Association (ADA)*. These booklets were left with the respondents to refer to as they filled out their 2-day dietary records. Data from these records were obtained over the phone. This procedure was designed to not only increase compliance, but also to increase accuracy and completeness, for the interviewer could probe for additional detail as the child recounted her/his food intake. The intake data were analyzed using the Food Processor program (ESHA 2002-2003). The Food Processor program converted food intakes into nutrient intake equivalents for each day. The three day averages were used in the analysis for total energy intake, total fat intake, and saturated fat intake, which were then used to calculate the percentage of energy from fat (y_1) and the percentage of energy from saturated fat (y_2).

The anthropometric outcome data came from the physical exam conducted by the interviewer: waist circumference (y_3), and weight and height were used to construct the body mass index (y_4).

Family Meal Ritual Variables: To measure this phenomenon, we used a scale developed by Boyce et al. (1983), which 13 items to which we added several additional indicators. The expanded scale included: "My family eats at the same time every night"; "My whole family eats together every night"; "In my family, dinner time is more than just a meal; it is a special time"; "In my family it is important to eat together at least once a day." The scale produced a Cronbach's alpha of 0.83.

Income and Time Allocation Variables: Each parent's income and time variables came from the parent's self-administered survey. For this study, we generated a variable that represents the average time per day a mother and father each spent with the child in direct activities. This measure is the total available time in a day minus the sum of all time spent on primary activities *not* spent with the child. Consequently, this represents the average amount of time per day the parent spends with the child as a primary activity. Note this measure does not distinguish between time spent in energy consuming activities (e.g., eating at home or away

from home) and energy expending activities (e.g., playing soccer or watching television). Nor does this measure include time spent in indirect activities – activities performed in the presence of the child, but not directly involving the child. We will discuss the possible implications of this in the conclusions.

Parental Status, BMIs, and Control Variables: The parents' status and BMI variables were constructed from the telephone interview data. The status variables are represented by father's less mother's age and father's less mother's education level. Also, each parent's BMI is calculated and included: father's BMI and mother's BMI. For the child, the data for the control variables was constructed from the child interview data, with the exception of child puberty stage: gender, race, ethnicity, and activity. The puberty stage was constructed from the Tanner development stage data. If the reported Tanner development stage data was greater than one, then a dummy variable for puberty was coded as one and zero otherwise. Activity was a dummy variable coded as one if the child participated in active exercise in at least 3 to 5 days in the last 14 days and zero if not.

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