FATHER ABSENCE, ONSET OF MENARCHE, AND BODY DISSATISFACTION:

IMPORTANCE OF FATHER ABSENCE

THESIS

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Stacey R. Gartrell, B.F.A.

Denton, Texas

August, 1999

Relationships between body dissatisfaction, dieting methods, father absence, and puberty timing were investigated in this study. Participants included adolescent females from Wave 1 of the National Longitudinal Survey of Adolescent Health. Logistic regression results indicated that girls without a biological father in the home were significantly more likely to have an early onset of puberty than on-time or late. Girls who experienced early puberty exhibited higher levels of body dissatisfaction, but didn’t use more dieting methods. Early onset girls more likely used dieting methods if their biological father was present than absent; however, no significant difference in body dissatisfaction was shown. A negative relationship with fathers indicated more body dissatisfaction. None of the attained findings were found when the biological mother was absent, and having a stepfather did not seem to matter. Evidence was revealed that fathers play a role in their daughters’ view of their own bodies.
FATHER ABSENCE, ONSET OF MENARCHE, AND BODY DISSATISFACTION:

IMPORTANCE OF FATHER ABSENCE

THESIS

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Stacey R. Gartrell, B.F.A.

Denton, Texas

August, 1999
TABLE OF CONTENTS

LIST OF TABLES ........................................ iv

Chapter

I. INTRODUCTION ........................................ 1

   Overview
   Puberty: Biological Mechanisms
   Timing of Puberty
   Body Image: Overall American View
   Timing of Puberty and Body Image
   Family Dynamics
   Timing of Puberty and Family Dynamics
   Evolutionary Theory of Socialization
   Statement of Problem
   Hypotheses

II. METHOD ............................................ 39

III. RESULTS ............................................ 43

IV. DISCUSSION .......................................... 48

APPENDIX A ............................................ 55

APPENDIX B ............................................ 58

APPENDIX C ............................................ 65

REFERENCES ........................................... 76
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Table Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demographic Information for the Sample</td>
<td>66</td>
</tr>
<tr>
<td>2</td>
<td>Logistic Regression for Father Absence and Onset of Menarche</td>
<td>68</td>
</tr>
<tr>
<td>3a</td>
<td>Logistic Regression for Early Puberty with Body Dissatisfaction</td>
<td>69</td>
</tr>
<tr>
<td>3b</td>
<td>Logistic Regression for Early Puberty with Any Weight Loss Method</td>
<td>70</td>
</tr>
<tr>
<td>4</td>
<td>Chi-Square for Puberty and Body Mass Index Score</td>
<td>71</td>
</tr>
<tr>
<td>5a</td>
<td>Logistic Regression for Early Onset of Puberty, Father Absence, and Body Dissatisfaction</td>
<td>72</td>
</tr>
<tr>
<td>5b</td>
<td>Logistic Regression for Early Onset of Puberty, Father Absence, and Weight Loss Method</td>
<td>73</td>
</tr>
<tr>
<td>6a</td>
<td>Logistic Regression for Father Absence and Body Dissatisfaction</td>
<td>74</td>
</tr>
<tr>
<td>6b</td>
<td>Logistic Regression for Father Absence and Weight Loss Method</td>
<td>75</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Overview

Adolescents go through a variety of stressors including school change, the newness of dating and other social experiences, peer pressure, a changing relationship with parents, striving for independence, and emerging sexuality. However, one of the most investigated stressors has been puberty. When a child's body changes into an adult's body, physical changes occur as well as psychological and social changes. Research has shown differences in adjustment among adolescents, girls in particular, who experience early, on-time, or late onset of puberty. One of the issues early maturers tend to encounter is an increased level of body dissatisfaction and a drive for thinness. This dissatisfaction can affect many areas of an adolescent's life.

An adolescent tends to have an even more difficult time adjusting if many stressors occur at the same time. It is possible that some of the stressors can even contribute to or cause the early onset of puberty. Belsky, Steinberg, and Draper (1991) proposed an evolutionary theory that states family conflict or father absence can be a stressor that contributes to the early onset of puberty. Moffitt, Caspi, Belsky, and Silva (1992) supported the occurrence of early menarche related to father absence.
If father absence contributes to an early onset of puberty, and girls with an early onset of puberty tend to encounter an increased level of body dissatisfaction and a drive for thinness, how are these girls different from others who experience early onset of menarche? Do these adolescents experience an exacerbated case of body image dissatisfaction, over and above girls who experience early puberty without father absence? The purpose of this study was to investigate a large sample of adolescent girls and looked at perceived weight, dieting methods, father absence, and timing of puberty to determine if these variables were related. It was expected that most girls who had reached menarche early would have experienced body dissatisfaction and engaged in some level of weight control or management. However, it was also expected that a larger number of the adolescent females who had experienced the absence of a biological father and early puberty would have reached this level of dissatisfaction and reported excessive weight management behaviors. Specifically, it was purported that, (a) father absence would relate to early puberty; (b) early puberty would relate to weight control/body dissatisfaction; and (c) father absence was related to early puberty and even higher levels of weight control/body image dissatisfaction.

Puberty: Biological Mechanisms

During adolescence, puberty changes a child’s body into an adult’s, bringing new biological mechanisms into play. In fact, besides fetal and neonatal growth, early adolescence is the time to see the most rapid human growth (Farber & Morgan, 1982; Malina, 1978). Behavioral research has focused on measuring peak height velocity, weight, body hair, menarche, and breast growth for girls, and penile growth and
testosterone concentrations for boys (Brooks-Gunn & Warren, 1985; Sinkkonen, Anttila, & Simes, 1998). For girls, age at menarche points to a more advanced stage of pubertal development, which follows growth in height, breast development, and emergence of pubic hair (Moffitt, Caspi, Belsky, & Silva, 1992). Also, menarche is often correlated with a girl's increase in body fat (Brooks-Gunn, 1987). In fact, some studies have shown that adolescent girls gain approximately 30% more fat with the onset of menarche (Petersen, 1988).

Researchers have asserted that although menarche is not the only mark of puberty, it is one that girls can report quite reliably (Brooks-Gunn & Warren, 1988). Menarche onset is also used to measure pubertal status because it is the most noticeable sign of puberty. Further, it is the most widely used indicant of pubertal status (Brooks-Gunn & Warren, 1985). Other measures include the Tanner Scale, which measures stages of secondary sexual development for breast and pubic hair growth in girls by using a set of schematic drawings (Brooks-Gunn et al., 1987). The Pubertal Development Scale, a self-measure of pubertal changes is also used and has been found to be reliable and valid (Petersen, 1988). In addition, some studies use not only the girl's self report of onset of menarche, but also their mother's to gain reliability, although most use youth report only (Moffitt et al., 1992).

Pubertal onset for girls ranges from 8.9 to 13.0 years in 95% of normal girls (Tanner & Davis, 1985). Similarly, Moffitt et al. (1992) discovered that reported age at menarche ranged from 102 to 180 months (8.5 years to 15 years), with a mean = 155.28 months (12.94 years), $SD = 12.12$ for a sample of girls in New Zealand. Other studies

...
have shown mean menarcheal age to be 12.6 to 12.8 for American Caucasian adolescents (Zacharias et al., 1976), or an average age of onset at 12.1 years (Usmiani & Daniluk, 1996). Herman-Giddens et al. (1997), in a large cross-sectional study of 17,077 young girls in a pediatric setting, showed that the mean age of menses for Caucasian girls was 12.88 years (SD, 1.20) and for African-American girls was 12.16 years (SD, 1.21). In addition to menstrual onset, the researchers found that the mean age of onset of breast development was 8.87 years (SD 1.93) for African-American girls and 9.96 years (SD (1.82) for Caucasian girls. This data concurs with other reports that show girls are developing pubertal characteristics at younger ages than previously published norms (e.g., Marshall & Tanner, 1969; Harlan, Harlan & Grillo, 1980). In a retrospective study, researchers found that there has been a decrease in the age of onset at approximately .6 years per generation since the early 1900s (Katchadourian, 1977; Roche, 1979). In this study, the researchers asked three generations – women, their mothers, and their grandmothers, for age of onset of their menses. Whereas women in the most recent generation reported age of onset of puberty at 11.7 years, the middle generation (mothers) reported 12.3, and the oldest generation (grandmothers) reported age of onset at 12.9, suggesting an increasingly earlier onset of puberty across generations (Gilger, Geary, & Eisele, 1991).

In addition to physiological changes, psychological changes during puberty become very important not only for the adolescent, but also for the family and the larger society (Herman-Giddens et al., 1996). Unfortunately, adolescent girls often associate shame and embarrassment with the onset of menstruation, which is seen by our culture as
her transition into womanhood. Brooks-Gunn and Ruble (1982) found that as early as fifth grade, girls have clear expectations for the experience of menstrual symptoms. Premenarcheal girls expected to have more painful experiences than were actually reported by postmenarcheal girls. They expected menstrual pain, behavioral changes in school performance, water retention, and feelings of dizziness. It is thought that these premenarcheal girls attend more to the negative aspects of menstruation even without evidence of the painful experiences reported by postmenarcheal girls.

In addition, Brooks-Gunn and Attie (1996) found that girls view puberty as more stressful and requiring more adaptation than boys do. Girls have to adapt to the onset of physical changes with menstruation and possible negative beliefs about puberty; furthermore, girls may feel they face more negative consequences than males (Brooks-Gunn, 1991, 1992). On average, girls experience peak pubertal change two years earlier than boys (Koenig & Gladstone, 1998). This often occurs when girls are facing other simultaneous changes, such as school transition. The aspect of multiple changes creates a more stressful environment for the young girls. Koenig and Gladstone (1998) found that having positive feelings about puberty can moderate some negative impact of the changes that occur, particularly if girls have a positive attitude about the physical changes associated with menstruation. In contrast to girls, boys often experience puberty with coinciding increases in muscle and size, which puts them closer to a male ideal. Females, on the other hand, often get heavier and gain more fat, which puts them farther away from the female ideal of thinness (Striegel-Moore, Silverstein, & Rodin, 1986).
No doubt puberty brings with it a need for adjustment to new biological processes and a changing body structure. For female adolescents, puberty is most often indicated by the onset of menarche. Although the reported mean age of onset is between 12.1 and 12.8 years, the age of onset is becoming increasingly younger generation by generation. In addition to the physiological changes brought on by puberty, these young women often face psychological changes as well. They formulate ideas about how they feel about their changing bodies and appearance, how they feel others view them, and how they feel they relate to a thin feminine ideal body shape. In addition, they experience these changes earlier than boys in their same grade level, and they often face simultaneous changes such as school transition. It follows that puberty is a huge event in the life of an adolescent female and brings with it many changes, disruptions, and challenges, which deserve continued attention in research.

Timing of Puberty

Not all children go through pubertal development at the same time. Genetic and dietary factors can play role in timing (Garn, 1980), although more research is being conducted with a focus on related social factors in an adolescent’s life (Steinberg, 1988). Development has often been classified as occurring early, on-time, or late in relation to the average age of pubertal onset. It has also been suggested that girls, for instance, have more problems if they mature early, whereas boys were shown to have an easier time adjusting if they matured early (Brooks-Gunn et al., 1985). For girls, some studies have classified early (before 11.5 years), on-time (between 11.5 and 14 years), and late maturers (after 14 years) in terms of menarche and looked at the effects of this timing (Brooks-Gunn &
Warren, 1985). In another study (Moffitt et al., 1992) researchers classified timing of menarche as early (144 months, or 12 years and younger), middle (145 to 167 months, or 12 years, 1 month to 13 years, 11 months), and late (168 months, or 14 years and older). Although researchers differ somewhat on what constitutes classification as early, on-time, or late maturing, most researchers approximate “on-time” maturity at approximately age 12.

Early maturing girls have been found to have more of a risk for problems with self-esteem, depression, and negative body image (Simmons, Blyth, & McKinney, 1983) and Brooks-Gunn (1992) found late maturity to serve as a protective factor in relation to depression in adolescent girls. In this case, it appears to be the timing of puberty and not just the onset of puberty that is linked to the increase in negative emotional or psychological impact. Early maturers develop a conspicuously different body shape from relatively late maturers since the range of pubertal onset can be from age 8 - 15. Further, since girls tend to experience pubertal change about two years prior to boys, they are more at risk for problems at the beginning of the adolescent years when more changes are likely to occur simultaneously (Tanner, 1972). Adolescents can experience both normative and nonnormative changes or events. Normative life events can be changes such as school change (i.e., grade school to junior high) and onset of dating. Nonnormative life events can include changes such as disruption in parents’ marital status or change of residence (Simmons & Blyth, 1987). As previously mentioned, the timing of the onset of menarche can also coincide with such changes as school transition from grade school to junior high, the start of dating, and a desire for independence from
parents. Simmons et al. (1987) found that experiencing one change actually made other changes more difficult. Other research suggests that adolescents experience simultaneous life changes as stressful and also have a difficult time adjusting to more than one change at a time (Coleman, 1989). Similarly, puberty also relates to differential prevalence rates of depression among boys and girls. Whereas boys experience more depression before they reach puberty (about 2:1), girls experience more (2:1) once they reach mid-puberty (Angold et al., 1998). Also, there has been some support for differing behaviors in boys and girls in relation to their hormones; girls' behaviors appear to be more dependent on external factors such as social context rather than directly related to hormonal influence. In contrast, boys' behaviors, especially behavior problems, appear to be more directly related to hormonal influences (Nottelmann, Inoff-Germain, Susman & Chrousos, 1990).

Given their chronological age, early maturing girls have less time to develop coping strategies to deal with the onset of body changes and concurrent social pressures (Brooks-Gunn, Petersen & Eichhorn, 1985). In one study researchers looked at the number of concurrent changes (both normative and nonnormative life events) that occurred for boys and girls. Boys experienced more negative effects of concurrent changes in relation to lower grade point average and lower levels of extracurricular participation; girls' self-esteem and extracurricular participation were most negatively affected by multiple changes (Simmons et al., 1987). The more changes experienced, the more problems. And with girls, "the more changes the girl has experienced recently, the lower her self-esteem, club participation, and GPA" (p.1227). Other studies have also found that events such as the onset of puberty and other adolescent normative changes
have been found to be associated with emotional distress "when they either co-occur with negative life events or synchronously occur" (Flanagan & Eccles, 1993; Smolak, Levine, & Gralen, 1993; Simmons & Blyth, 1987). Synchronous changes are changes or events that occur at the same time. Smolak et al. (1993) defined synchronous maturation to include onset of puberty occurring at the same time as other synchronous events such as onset of dating and/or beginning to date.

The timing and onset of puberty has received a substantial amount of research attention. In particular, girls with an "early" onset of menarche have been found to have more trouble adjusting to the changes of puberty than girls classified as on-time or late. Some problems found to be associated with early onset of puberty in girls include depression, lowered self-esteem, and negative body image. In addition, research has shown girls to be at even higher risk for psychological and emotional problems if they experience early puberty concurrently with other life changes, such as transition to a new school, introduction of dating, and changing relationships with parents, apparently because they have less time to adjust to the combination of changes.

Body Image: Overall American View

Body image is a combination of a person’s actual physical characteristics and her subjective experience and evaluation of her body (Blyth, Simmons, & Zakin, 1985). In addition, cultural ideals of body size and appearance can influence a person’s body image. If a person does not believe she meets cultural standards, her self-esteem is likely to be affected. Young girls are quite concerned with their weight and thinness, often because they wish to meet the cultural ideal of an unrealistically thin body shape. This
external standard then becomes the measure used to determine self worth. It is not unusual for a girl to fluctuate from feeling good or bad about herself depending on how she looks or how much she weighs on a certain day. Furthermore, girls often feel pressured by the image of the ideal woman that includes being unattainably thin. They feel they cannot measure up to this ideal, feeling especially inadequate at a time when their bodies are changing with the onset of menses and gaining approximately 30% more fat (Petersen, 1988).

Female body dissatisfaction often begins with puberty. However, Sands, Tricker, Sherman, Armatas, and Maschette (1997) found girls and boys have well-formed perceptions of social ideals regarding body shape before puberty. However, girls' increase in body fat during puberty pushes them further away from the feminine thin ideal, whereas men become closer to their ideal by gaining in size and muscle mass (Striegel-Moore, Silberstein, & Rodin, 1986). Thus, boys could look at puberty as less stressful, since it helps them to achieve their body ideal. In contrast, it may get worse for girls, as their bodies' biological forces take over, which is often related to lower body satisfaction. In addition, Richards, Boxer, Petersen, and Albrecht (1990) found girls to be less satisfied with their bodies than boys, and to perceive their bodies as heavier than they desired. Further, the girls were most satisfied when they saw themselves as "underweight" and boys were most satisfied being self-classified as "average weight." Additionally, female adolescents have been found to generally perceive their bodies as less desirable to males (Tiggemann & Pennington, 1990), perceiving their "current weight" or being "overweight" as the main source of dissatisfaction (Adams, Katz,
Beauchamp, Cohen, & Zavis, 1993; Huon, Morris, & Brown, 1990). However, not all girls are dissatisfied with their bodies. A girl's satisfaction with her athletic strength and participation in extracurricular activities was related to body satisfaction.

Nevertheless, with the rising numbers of young women with disturbed body image, more attention has been given to this problem. Research found that increasingly, almost ½ of young women believe they weigh too much and make efforts to lose weight (Cash, Winstead, & Janda, 1986; Rosen & Gross, 1987; Wardle & Beales, 1986). In contrast, research has also found that the number of men who report overall body dissatisfaction is only approximately ¼.

Research has also pointed to the growing clinical interest in the subject of a drive for thinness, since negative body image is so often associated with psychosocial difficulties (Cash & Pruzinsky, 1990). Cash, Winstead, and Janda (1986) found that Americans were more dissatisfied with their bodies when compared to results obtained in a study conducted 13 years prior (Berscheid, Walster, & Bohnstedt, 1973). They posited that this body image dissatisfaction was due in part to the influence of cultural standards of thinness and attractiveness. The researchers explained that young girls are taught to value their beauty and boys are taught to value their strength and athletic ability. They found women more often cited appearance and weight as more important than fitness. In contrast, men reported more satisfaction with their bodies if they worked out and were fit. Additionally, in comparison to women who have been found to misperceive their bodies as heavier or overweight (Gralen, Levine, Smolak, & Murnen, 1990; Hill, 1993; Steiger et al., 1992), men tend to misperceive their bodies as smaller or lighter (Tiggemann &
Pennington, 1990). This misconception appears to lead to more dieting among women than men. The idea of “social construction of the body” involves the appearance, thinness, and physical attractiveness forming the concept of femininity, and physicality and prowess form the concept of masculinity (Dukes, 1990). Taylor, Parker, Bagby, and Bourke (1996) found certain risk factors related to weight concerns in elementary school age girls: peer's ideas on weight and dieting, trying to look like women on television and in magazines, body mass index (BMI); these factors accounted for 57% of the variance. Similarly, accounting for 55% of the variance in weight concerns, the girls in middle school placed importance in peer's ideas, the protective factor of confidence, BMI, trying to look like women in magazines and on television, and being teased about their weight. These findings suggest that the risk factors are multivariate and can vary from one developmental stage to another. This further suggests the complicated relationship among risk factors related to weight concerns over time. In this socialization process, young girls and women learn to value looks over any other personal attributes or accomplishments.

The drive for thinness includes placing importance on thinness, having a thin body ideal, and a fear of becoming fat (Striegel-Moore et al., 1995). Fallon and Rozin (1985) and Rosen and Gross (1987) found that thinness is seen as a mark of female beauty and this idea has influenced the “epidemic” of body dissatisfaction and attempts at weight loss by not only women and adolescents but young girls (Hill, Oliver & Rogers, 1992; Koff & Rierdan, 1991; Paxton et al., 1991; Maloney, McGuire, Daniels & Specker, 1989; Stein & Riechert, 1990; Story et al., 1991; Wardle & Marsland, 1990; Whitaker et al., 1989). Other research has also found that a “fear of fat” is fairly common and brings
with it repeated attempts at dieting and other measures to lose weight. Some examples of behaviors used to lose weight include dieting, purging, use of laxatives, and excessive exercise. However, there is a difference between healthy eating, health concerns, and excessive measures.

Research has also shown that overweight women then to have a “more negative body experience” (Cash, 1994; Cash et al., 1986; Cash & Green, 1986; Cash & Hicks, 1990). A distinction has been made between having a negative body image and believing that one weighs too much. Negative body image is found in many young women. It seems that most people with disturbed body image are dealing more with “appearance-related cognitions than with physical realities” (Cash et al., 1986). Further, Finkenberg, DiNucci, McCune, and McCune (1993) found that many women who experience a high level of physical conditioning are still dissatisfied with their bodies. Often cognitive therapy is used in which the client focuses on and examines the source of her negative or irrational beliefs. The source of these negative beliefs has been suggested to be linked to family members, teachers, doctors, friends, dating partners, and the media (Robinson & Bacon, 1996).

Over and above negative cognitions, dieting and reported dieting failure can lead to low self-worth (Tiggemann & Pennington, 1990). Sands, Tricker, Sherman, Armatas, and Maschette (1997) found that for males and females in a 6th grade sample, higher scores on a measure of “drive for thinness” were associated with lower scores of self-worth. They also found a greater discrepancy between actual and ideal body shape with a greater score on “drive for thinness.” Twice as many girls as boys wanted to be thinner
than they actually were, and the girls were more likely to engage in weight loss practices than the males in the sample. This preference, however, lessened over the time of the study (3 separate assessments over 9 months), ending with the girls preferring a larger ideal body shape over time. This finding suggests girls' body image ideal is not as stable as previously found. However, of many explanations considered, the researchers were not able to determine what caused the shift in preference for a larger ideal body image.

Dissatisfaction with body image is not only distressing and a potential health risk, it can also interfere with a person's ability to function normally. Although body image dissatisfaction often begins at puberty, it is a far-reaching and often a long-lasting problem for girls and women. Dissatisfaction with body image has been associated with depression, negative self-esteem and social introversion, social anxieties, and sexual difficulties (Noles, Cash & Winstead, 1985; Archer & Cash, 1985; Cash, 1985; Cash, Winstead & Janda, 1986). Also, women with a negative body image “often make more sweeping negative self-evaluations such as being weak, lazy, or lacking in self-control” (Butters & Cash, 1987), which affect their global self-esteem.

Current research on women, both adolescent and adult, suggests many factors, including biological, demographic, and psychological factors, relate to a thin ideal and the possible onset of eating disorders. Research points to the joint maturational and biological factors that can lead to the development of eating psychopathology (Crisp, 1981). Additionally, Rodin, Silberstein, and Striegel-Moore (1985) stated that the widespread concern for weight and dieting among women is “normative discontent” that poses a risk factor for bulimia nervosa. Further studies supported risk factors connected
to eating disorders that include excessive weight concerns and dieting, family history of eating or affective disorders, and peer pressure (Killen et al., 1994, 1996). A disturbance in body image is also a core factor of eating disorders, both leading to and maintaining them (Cash & Brown, 1987). Interestingly, Striegel-Moore (1995) and Fryer et al. (1997) pointed out that most studies look at these various determinants separately, even though there is evidence of a multifactorial nature of the development of eating disorders.

Eating problems can begin at one end with body dissatisfaction, lead to non-disordered dieting, and eventually lead to a true eating disorder. An adolescent’s response to puberty, as in negative body image, low self-esteem, and psychopathology in addition to social ideals of thinness can lead to severely disordered patterns of eating (Koff & Rierdan, 1991). Most girls do not develop full blown eating disorders, but they do frequently diet (Rosen & Gross, 1987), and that in itself can endanger a young woman’s health. Additionally, researchers have suggested that dieting can be self-perpetuating once it begins (Lissner et al., 1991). Graber, Brooks-Gunn, Paikoff, and Warren (1994) reported that the development of eating problems for young girls poses serious health problems with physical and psychological growth. They found that girls with recurrent eating problems had a higher incidence of comorbid depressive affect than girls with transient eating problems. Risk level for eating problems was measured by cutoff points on the Eating Attitudes Test, which measures eating attitudes and participation in such behaviors as pathological avoidance of food, preoccupation with a thin body shape, bingeing and purging, as well as other negative behaviors. Unfortunately, some researchers suggest that a majority of those who are so obsessed with losing weight are
actually of normal weight (Bailey & Goldberg, 1989; Cash & Hicks, 1990 both cited in Cash, Counts & Huffine, 1990).

Studies have shown that perceived overweight and body dissatisfaction correlate with dieting and binge eating in adolescent females in diverse ethnic groups (French et al., 1997). In fact, poor body image was found to be the strongest correlate to dieting, purging, and binge eating among a large public school sample. In the diverse ethnic group sample, poor body image and perceived overweight were found to be consistently correlated with adolescent dieting and binge eating. Also, research found that lower family connectedness, greater peer acceptance concerns, emotional stress, and sexual abuse history were also associated with binge eating (French et al., 1997).

A woman's perception of her body can be tied to many areas, such as actual body size, cultural standards, and her own subjective evaluation. With the onset of puberty young girls show an increase in body weight and body fat, which often coincides with body dissatisfaction. Often girls' perceived body image correlates with lowered self-esteem, as they compare themselves against a cultural ideal of body shape and size. On the other hand, when boys enter puberty, by gaining weight and muscle mass they tend to get closer to the male cultural ideal. Research has focused on the adolescent female concern with body image and efforts to control weight because so often these concerns are associated with psychosocial difficulties. In addition to these girls' work at decreasing their size and weight, their continued (and often failed) efforts at dieting and exercise often lead to lower self worth and negative body image. Research has cited an association between negative body image and negative self-esteem, depressive affect, social
introversion, social anxieties, sexual difficulties, and the possible onset of eating disorders.

Timing of Puberty and Body Image

Many factors can lead to the onset of body dissatisfaction and disturbed eating attitudes and behaviors. For adolescent girls in particular, the factor of pubertal timing has been considered the relevant contributing factor (Smolak, Levine, & Gralen, 1993). An adolescent's experience of development and body image is complex in nature and includes many factors, two of which are chronological age and physical maturation (Usmiani & Daniluk, 1996). Richards, Boxer, Petersen, & Albrecht (1990) reported that advanced stages of pubertal development were significantly related to actual increases in weight, in addition to less satisfaction with weight and perceptions of being overweight for girls. Boys reported more satisfaction with their actual weight that occurred with pubertal development.

Looking to explain adolescent body dissatisfaction, some researchers have pointed to the influence of pubertal timing, while others have taken puberty and added it to other synchronous events in an adolescent's life. As mentioned previously, events concurrent with puberty can include school transition, the initiation of dating relationships, need for independence, or nonnormative changes such as disruption in parents' marital status or change of residence (Simmons & Blyth, 1987). In this case, the basis for adolescent female body dissatisfaction rests with the idea that cumulative stress can affect psychosocial functioning.
In general, researchers have looked to at least two models to explain the relationship between cumulative stress and female body dissatisfaction. They found girls, but not boys, more likely to make a transition to middle school or junior high at the same time they enter puberty and at the same time they begin to date. These concurrent events can lead to enormous levels of stress, which can influence the onset of eating problems and body dissatisfaction. Levine and Smolak (1992) found that female onset of puberty tends to coincide with the onset of dating and the change from elementary to middle school, all in the same year. They alleged that when girls face this combination of physical and social change, they also tend to experience increased stress and problems with body image. In a subsequent longitudinal study, Smolak et al. (1993) looked at “immediate and long-term effects of early vs. synchronous maturation” in 79 public middle-school girls measured in sixth and eighth grade. These girls rated their perception of their own body shape as compared to figure drawings by rating which shape most matched their own and which one they most wanted to look like, and also responded to a question regarding satisfaction with their current body shape as measured by the Children’s Eating Attitude Test (ChEAT). The ChEAT measures participation in behaviors related to bulimia nervosa and anorexia nervosa, such as bingeing, purging, and excessive dieting. The research showed more dieting and greater body dissatisfaction among the early maturing girls and the girls with synchronous onset (starting both menstruation and dating by the sixth grade measure) than the girls who had later synchronous onset (starting both menstruation and dating in 8th grade). They found girls more likely to experience concurrent menstruation, change of school, and initial dating if
they started menstruating in the sixth grade as opposed to seventh or eighth. Thus, early maturing girls started dating earlier; with 50% beginning in sixth, 26% in seventh, and 21% in eighth. However, they did not find a significant difference in body dissatisfaction and dieting between early onset of menstruation (girls in sixth grade) and those who had not yet reached menarche. As found earlier by Smolak and Levine (1992), they did find synchrony of events to have a significant effect on body dissatisfaction and disordered eating attitudes and behaviors. Thus, being both early and experiencing synchronous developmental changes in the same year (menstruation, starting to date, transition to middle school) appeared to put these girls at risk for body image problems. Although at increased risk when facing the combination of factors, from this sample of sixth to eighth grade, more girls faced eating problems in the eighth grade because their eating/dieting problems and body dissatisfaction became more marked as middle school progressed. One explanation of increased eating problems for the eighth grade girls, who experienced early pubertal onset, is the prolonged effects of self-perpetuated dieting. If the girls start dieting earlier with their earlier onset of puberty, they experience a longer period of dieting and attitudes of negative body image. Smolak et al. point to the need for future research to investigate “synchrony with normative and non-normative events as well as potential mediators” such as familial attitudes about body size and eating, peer pressure to adhere to society’s thin body ideal, social support, or media exposure (p. 366).

In one study, Usmiani and Daniluk (1996) found self-esteem as the strongest predictor of variance in body image for both mothers and their menstrual (within the previous 36 months of the study) daughters. For two sets of mothers (those of menstrual
and premenstrual daughters), their own self-esteem was the significant predictor of their own body satisfaction. For premenstrual daughters, their own high femininity scores on a measure of gender role identity, and not self-esteem, was a significant predictor of positive body image. For menstruating daughters, their own self-esteem and high masculinity gender role scores both contributed. Overall, self-esteem was the strongest predictor of variance in body image scores for mothers and their menstrual daughters.

Gender role identity involves the process a young woman goes through during puberty, integrating physical changes with what society has deemed gender appropriate behavior and appearance (Petersen, 1988). Researchers explained that some girls hated the changes initially experienced with puberty and achieved higher scores of masculinity because they were in a sense rejecting their new onset of femininity. Researchers also offer that girls who initially face menstruation also experience the newness of their changing bodies and formation of a new identity; the physical characteristics of breast development and onset of menses characteristic of femininity may not be integrated yet. Also, as mothers' (of menstrual daughters) body image scores increased (more positive body image), so did their daughters. Girls in this study with an average age of onset at 12.1 years among 82 girls in grades 7 to 11 in Canadian physical education classes, no significant differences between the body image scores of the 12-year-old premenstrual and menstrual girls. Thus, it does not appear that menarche alone accounts for the differences between premenstrual and menstrual girls. Some factors could include the older age in the study of the menstrual girls (mean age = 13.4) versus the premenarche girls (mean age = 12.5), and their significantly taller height ($M = 64.5$ inches vs. $M = 61.5$ inches) and heavier
body weight ($M = 114$ lbs. vs. $M = 99$ lbs.). The older, taller, and heavier girls, more likely to be in higher grade level, were more likely to be seen more positively as “developmentally mature” (p. 56). Also since the mothers’ positive perceptions of body image related to positive scores for their menstrual daughters, these daughters might have been more influenced by their mother’s perception of body image.

Angold and Worthman (1993) found the mean age for peak fat gain in adolescent girls is at 14.5 years, although the mean age for menarche is about 13 years. Duncan et al. (1985) found that female adolescent weight gain was associated more with an increase in fat, and male weight gain was associated with muscle. For girls, they do get heavier, but it is usually in normative increments, thus a normal body weight (Blyth et al., 1985). They also discovered late maturing girls to be thinner. Research has shown that during puberty a drive to be thin increases with stage of pubertal development (Killen et al., 1992; Striegel-Moore, 1995). Researchers point to the rapid increase in body fat that results from maturation in females. Also, Garner and Olmstead (1984) found girls to be significantly heavier post menarche and to score significantly higher on the Drive for Thinness subscale of the Eating Disorder Inventory than pre-menarcheal girls.

Duncan et al. (1985) found the least satisfaction with weight among the early maturing females, 69% wished to thinner than they were. Richards et al. (1990) also found an association between female body dissatisfaction and advanced pubertal development. Although the girls’ average weight was consistent with norms, researchers point to the differences in the girls’ perceived cultural ideals of thinness and the physical changes brought on by puberty. No association was found for males. Further, the outside
activities in which the girls were involved and concern with peer acceptance influenced their levels of body satisfaction. Girls from one community who reported less involvement in school-related extracurricular activities, less satisfaction with performance in athletics, and a greater degree of perceived cliquishness in the school indicated more body dissatisfaction and liked themselves more when they perceived themselves to be underweight than the girls from the second community sample.

Richards et al. suspect that the community differences in values in the school, peer groups and families most likely explain these differences. Thus, these researchers look to the environment in relation to the adolescent's perception of self.

It is thought that early maturing girls have the most enduring negative views of their bodies, starting when they are at the onset of puberty and even when all of their peers have reached physical maturity (Brooks-Gunn, 1987). Researchers have explained this long-lasting effect as possibly due to unchanging overall body shape and mass or the vulnerability to problems because of the stress of being "early" and "off-time" (Smolak et al., 1993). Also, it has been suggested that early maturing girls also enter dating earlier, and in doing so take on more adult beliefs and behaviors, such as dieting and valuing thinness (Magnusson et al., 1986). They have shown that girls believe that through dieting they can be more attractive and therefore successful in dating (Lissner et al., 1991).

Duncan et al. (1985) detected a difference in behavior among early, mid, and late maturers. Early puberty has been associated with body image disturbance and social deviance (Caspi & Moffitt, 1991; Ruble & Brooks-Gunn, 1982; Simmons & Blyth,
1987). It has also been reported that earlier puberty is associated with earlier onset of drinking and smoking among adolescent girls (Wilson et al., 1994). Overall, it appears that early pubertal development brings with it increased risk for physical, emotional, psychological stress.

Research has found the timing of the onset of puberty to be a contributing factor to the onset of body dissatisfaction and disturbed eating attitudes and behaviors. It has been shown that the timing of puberty combined with the onset of other life events such as school transition and the onset of dating form cumulative stress, which is associated with body dissatisfaction. However, it has also been found mothers’ positive body image scores relate to positive scores for their menstrual daughters. Although the gain in body fat at puberty is usually in normal increments, girls tend to view the increase negatively. Again, girls tend to be influenced by cultural ideals of thinness. Overall, it is believed that girls who mature earlier than the norm (before age 12) seem to have the most enduring negative body image because they make efforts to deal with it earlier and longer. In addition to dieting, girls who experience early puberty are more likely to have increased emotional and psychological stress including beginning to dating sooner, and showing social deviance like drinking and smoking.

Family Dynamics and Stress

Researchers have noted that conflict between parents and adolescents follows a curve, increasing during early adolescence, then maintaining the level of conflict, and tapering off when the adolescent leaves the parents’ home (Montemayor, 1983). Laursen,
Coy, and Collins (1998) found parent-child conflict increases slightly from early to mid adolescence and is less frequent in late adolescence.

Another focus of parent-child relationships during adolescents is family environment and the different relationships adolescents have with mothers and fathers. Fergusson and Lynskey (1996) found that adolescents characterized as resilient reported significantly higher levels of parental attachment and lower levels of maternal overprotection. Resilient adolescents have been signified as more intelligent than their peers, as having high self-esteem, and as having lower levels of novelty seeking. The quality of mother-daughter relationships has been shown to affect the willingness of adolescents to confide in their mothers (Monck, 1990). Additionally, reported closeness with mothers appears to buffer the negative effects brought about by changes in the family but not synchronous pubertal and school change (Petersen et al., 1991). Further, the importance of the mother-daughter relationship during adolescence has been studied as it relates to gender role identity development of adolescent girls, self-esteem, and body image (Striegel-Moore et al., 1986; Leaper et al., 1989). Body image is seen as an important part of identity formation.

Additionally, Fergusson and Lynskey (1996) found that resilient adolescents reported significantly higher levels of paternal care. The father-child relationship has gotten quite a bit of research attention. Petersen et al. (1991) found an adolescent’s closeness with father seemed to act as a buffer to pubertal change, family change, and synchronous school change. Further, Lamb (1997) stated that father absence could be harmful to a child’s emotional and social development, not just solely as the loss of a sex-
role model. Researchers state that family stress or insensitive child rearing can produce an atmosphere of insecurity for a child (Belsky et al., 1991). Children raised under these conditions are more likely to have behavioral problems and/or show increased depression and social withdrawal.

Although many have researched the parent-child relationship, very little has been conducted on eating disorders and the relationship to family dynamics, and even less conducted on body image and drive for thinness. Some studies have looked at family characteristics related to certain eating disordered behaviors (Hodges et al., 1998). For example, Hodges et al. (1998) found that both male and female eating disordered subjects found their families to be less supportive and cohesive, and less open to direct expression of feelings than the normal control groups. In addition, studies have looked at family variables using scales such as the Family Environment Scale in relation to eating disorders (Tyerman & Humphrey, 1983; Moos & Moos, Leon et al., 1985; Johnson & Flach, 1985). Again, it appears the few studies that have examined family relationships and adolescent body image/drive for thinness have focused on the mother-child or father-child relationship instead of the effects of the absence of a parent. It is also important to note that these studies have focused on severe eating disorders, not on the drive for thinness and eating disturbed behaviors that can lead to these disorders.

The onset of adolescence brings changes in the parent-child relationship, an adolescent’s increased desire for independence, and physical and emotional changes for both the adolescent and parents to understand. Researchers have found that parent-adolescent conflict increases slightly from early to mid adolescence. However,
adolescents who reported higher levels of parental attachment, lower levels of maternal
overprotection, and higher levels of paternal care have been classified as resilient.
Further, the presence and closeness of a father in adolescence has been shown to be a
buffer to changes experienced in puberty and synchronous school change. In fact,
researchers have shown that father absence can be harmful to emotional and social
development of the child. Although research has focused on family relationships during
adolescence, little research has investigated body image disturbance or drive for thinness
as it relates to family dynamics. Of the physical changes an adolescent girl and her
parents have to deal with is increased awareness of body size and new changes in shape.

Timing of Puberty and Family Dynamics

Many studies have investigated the role of changing parent-child relationships
during adolescence (Anderson, Hetherington, & Clingempeel, 1989; Usmiani & Daniluk,
1996). Some explain changes in relationships by pointing to the adolescent’s increasing
demands for independence and the parent’s negotiation of the child’s changing physical
and sexual status. In fact, Usmiani and Daniluk (1996) found that mothers and daughters
seem to interact differently with each other according to the daughter’s menstrual status.
They posited that the onset of menses and subsequent physical changes bring about stress
and conflict with developmental issues such as gender identity. Usmiani and Daniluk
failed to find a significant correlation between mothers and their premenstrual daughters
on measures of body image, whereas there was a significant correlation between mothers
and their menstrual daughters. For both mothers and their menstrual daughters, higher
self-esteem scores were associated with more positive body image scores. Other research
also points to the importance of the mother-daughter relationship during adolescent development in connection with gender role identity, identity development, body image and self-esteem (Striegel-Moore, Silberstein, & Rodin, 1986; Kamptner, 1988).

In addition to mother-daughter relationship, the role of the father in the life and development of a child has been investigated for many years. There has also been some investigation of the role of father absence on the onset of menarche (Belsky, Steinberg & Draper, 1991; Moffitt et al., 1992). The purpose of one longitudinal study was to look at father absence, early behavioral problems and subsequent timing of puberty (Moffitt et al., 1992). They found a correlation between family conflict at age 7 and earlier menarche; the more conflict, the earlier the onset. Also, if fathers were absent before age 11, the more years they were absent, the earlier associated menarche. In this study, 50% of the girls who experienced an early onset had experienced the loss of their biological father for some time, as opposed to 24.4% in the late onset group, and 33.2% of the middle onset group.

In addition, Steinberg (1988) found that changes in family relationships related to pubertal changes. He showed that family conflict predicted early female pubertal development. Also, Flanagan and Eccles (1993) found adolescents who experienced a nonnormative negative life event of family stress (changes in parental work status) during a time of normative life transition experienced more problems in adjustment. These adjustment problems tended to be external; that is, more disruptive behavior and a more difficult time getting along with other students.
Other research has looked to heredity and socially-related stress as leading to an early onset of puberty. An association between social experience and hormonal activity has been studied as a reciprocal relationship (Belsky, Steinberg & Draper, 1991). According to the evolutionary theory by Belsky, Steinberg, and Draper (1991), one such stressor leading to an early onset could be father absence. They posited that if a child experiences a stressful upbringing with the absence of a father, the child comes to distrust pair bonds and feels unworthy of love; the child may then enter early pubertal development and reproductive readiness. Since these children have learned to distrust pair bonds, they behave in a way that reflects their limited interest in child rearing; they choose instead to focus on growth and mating. Earlier, Steinberg reported that family conflict predicted the early onset of puberty in girls (1988). Surbey (1990) also looked at parental absence, specifically the absence of the biological father, associated with early menarche. He found that girls who experienced the absence of a father before menarche matured 4 to 5 months earlier compared to girls who experienced the loss of a mother. In fact, Surbey found that female puberty development did not differ in girls who experienced mother absence or who experienced growing up with both parents. He also pointed to earlier menarche in relation to how long a period of father absence occurred; the longer the period of father absence, the earlier the onset of puberty. Alternately, within a group of girls, who did grow up with a father present, the earlier maturers were ones who stated they had experienced more stressful life events in childhood. He also indicated that the differences he found between the groups of girls were not confounded by differences in birth order, family size, socioeconomic status, or weight.
Much of the research uncovering the link between social experience and hormonal activity has focused mainly on primates and not humans (Steinberg, 1989). However, in one study, Steinberg (1988) showed female adolescents to mature earlier if they were living in a strained family setting, particularly a strained mother/daughter relationship.

According to Petersen et al. (1991) close family relationships, specifically with the father, can act as a buffer to synchronous changes that occur in adolescence. That is, if a teen experiences discomfort or stress, he or she will adapt better if he or she has other areas of comfort or security to rely on. However, researchers have not determined if this only happens with fathers or if maternal support is just as important.

Moffitt et al. (1992) asked, “Why do girls from father-absent and/or conflicted homes begin to menstruate at an earlier age than girls from mother-absent and intact homes?” (p. 48) and offered two ideas. One solution was that genetic inheritance accounts for the connection between family conflict and early pubertal development. If a girl matures early, she is more likely to marry and have children at a young age, and also to divorce (Newcomber & Udry, 1984). This pattern puts the child in a father-absent situation, possibly leading to early maturation for her as well. For the second solution, Moffitt et al. referred to Belsky et al. (1991) and their sociobiological model of development. According to Belsky's model, children who experience family stress during childhood and into adolescents tend to encounter both psychological and behavioral problems, which then invoke earlier readiness for reproduction. Moffitt et al. did find that family conflict and family absence contributed to the timing of menarche. It was found
that girls who experienced an environment of family conflict assessed at age 7 or father absence in childhood was directly associated with an earlier age at the onset of menarche. However, they found no support for the mediational role of behavior problems (or weight).

It has been shown that mothers and daughters interact differently according to the daughter's menstrual status (Usmiani & Danilik, 1996); higher self-esteem scores for both were associated with positive body image for both. In addition, the role of the father, in particular father absence, has been associated with early behavioral problems and earlier onset of menarche (Surbey, 1990). It has also been found that changes in family relationships and especially family conflict and father absence related to an earlier onset of puberty (Moffitt et al., 1992). Further, socially related stress and heredity have been found to lead to early onset of puberty in females (Belsky, Steinberg, & Draper, 1991). However, even in females with an absent father, early stressful events in life correlated with an early onset of puberty. Nevertheless, it seems that family dynamics strongly interact with the onset of female puberty.

Evolutionary Theory of Socialization

Belsky, Steinberg, and Draper's (1991) comprehensive model of socialization hypothesizes that children who grow up with family stress tend to experience behavioral and psychological problems, which then lead to earlier pubertal development and subsequent readiness for reproduction. They gather many of their ideas from evolutionary ecologists who believe that growth and development, mating, and parenting all need to be undertaken for an organism to reproduce. Belsky et al.'s (1991) evolutionary theory of
socialization for childhood experience involves two developmental pathways. The pathways differ due to differing needs to maximize reproductive success. One pathway results in unstable pair bonds (serious relationships with the opposite sex) and limited interest in child rearing due to a stressful environment with insecure parental attachments, resulting behavior problems, then early pubertal development and sexual precociousness. These individuals will develop patterns of behavior designed to reduce the age of biological maturation and then put more effort into growth, development and mating rather than into parenting. The other pathway involves secure attachments to parents due to the non-stressful rearing environment, followed by an on-time development in puberty, and later secure relationship bonds and a healthy interest in child rearing. In contrast to the individuals following the first path, these individuals put more energy into building relationships and focusing on parenting efforts. Both pathways can be seen as a cumulative additive effect of circumstances and behaviors, not simply linear paths.

Moffitt et al. (1992) conducted the first empirical test of Belsky's model of the effect of psychosocial factors on the onset of menarche, although did not find the effects cumulative. They did support the assumption that father absence predicted an earlier age of menarche, and showed an additive influence if the girl's weight was included. Girls who ranked in the heaviest half of the study's sample reached menarche an average of 3.6 months earlier than the norm. They also view reproductive fitness as the ultimate function of these processes, a pattern or system of "causation", and the "strategy" may not be conscious.
Promoting the idea of a strategy for reproduction, earlier research suggested that boys who experience the absence of a father in divorce typically showed stereotypical and often exaggerated masculine childhood behaviors that would shape the way they look at relationships or pairs (Draper & Harpending, 1982). Adolescent girls were affected in a similar way, tending to act sexually "promiscuous." Basically, the researchers believed that children who did not have a father involved in their upbringing did not expect to have stable pair bonds or an interest in child rearing. Thus, these individuals were more likely to engage in sexual activity earlier and to be opportunistic and self-serving, since they believe that they don't need to invest effort into parenting, only mating. The researchers proposed that family conflict may predispose the girls to internalizing problems (high levels of sadness, depression, and social withdrawal) which relates to lowering metabolism and storing fat, which would in turn stimulate the onset of menarche. On the other hand, children who had an upbringing that involved a father expected that they would establish and maintain close relationships and have mutual commitment in that relationship, and therefore may have felt comfortable to put off sexual activity, having understood and anticipated having enduring close interpersonal relationships. These young adults in this latter category would be more concerned with the quality of relationships than the quantity. Moreover, a child comes to develop a sense of trust through the experience of availability and reliability of people around him or her. In other words, children become highly sensitive to their early developmental experience, they develop behavior patterns and ideas on that experience, and in turn base later mating and child-rearing behavioral patterns on that specific experience. Belsky et al. (1991)
took this theory to a broader level of early experience and psychological development and developed it into an evolutionary theory of socialization. Belsky and colleagues felt that through evolution, people develop under certain conditions and then vary their mating and child-rearing patterns based on their experience in those conditions.

Some problems seen in Belsky's model include ideas not supported by Moffitt et al.'s (1992) study. Moffitt et al. found that contextual stressors on menarche were not mediated by behavior problems or weight as Belsky et al. had predicted. Also, Belsky et al. posited that all three conditions had to be met to satisfy their theory of early onset of puberty: children who grew up in a stressful environment, and experienced rejecting or aversive parent-child relationships, and experienced pre-pubertal problem behaviors.

Belsky et al.'s (1991) hypothesis that children who grow up with family stress tend to experience behavioral and psychological problems, which then lead to earlier pubertal development and subsequent readiness for reproduction is a comprehensive model of socialization. One type of childhood stress considered was father absence. The researchers posit that if a child experiences a stressful upbringing with the absence of a father, he or she will have little trust in pair bonds and childrearing and instead focus on growth and mating. Moffitt et al. (1992) tested Belsky et al.'s model and found support for the assumption that father absence predicted an earlier age of menarche. However, they did not find support for Belsky et al.'s mediational model that all three conditions must be met to satisfy their theory of early onset of puberty.
Statement of Problem

Researchers have looked at puberty, the effects of its timing, drive for thinness, and the effects of father absence individually; however, it does not appear that researchers have investigated these together. The exception is Moffitt et al. (1992) who investigated Belsky et al.'s (1991) hypotheses using longitudinal data. Belsky et al. suggested that the important variables, rearing, subsequent attitudes, behaviors and reproductive strategies, have a cumulative additive quality. His is a large and complex sociobiological view; the theory posits that natural selection has "shaped pubertal and subsequent sexual and pair-bonding processes to be responsive to contextual conditions of childhood." (p. 682). Belsky et al. in fact found links between prepubertal rearing experiences such as father absence and early puberty. Further, Moffitt et al. (1992) found that having any two of four risk factors (weight, behavior problems at age 7, family conflict, father absence) was associated with an earlier onset of menarche by two months and having all four was associated with an eight month acceleration. By leaving out weight, girls experienced only a three-month acceleration. However, Moffitt et al. (1992) did not find the risk factors to be a cumulative influence, but did find family conflict and father absence to contribute the timing, "over and above the effects of weight" (p. 54). Further, research into the combined aspects of the effects of pubertal timing, the effects of father absence, and a drive for thinness has been approximated by researchers who have looked at the combined social, psychological, and biological issues facing adolescents (e.g., Brooks-Gunn & Warren, 1989; Susman et al., 1987). Again, however few have used a theoretical model and a combination of variables.
In addition to the ideas of effects of prepubertal family environment on early puberty, an adolescent girl who feels unloved, unworthy of love, and enters puberty early, is more likely to feel dissatisfied with herself and her body and to develop eating disordered behaviors or a drive for thinness. Low self-esteem associated with stressors and emotion-focused coping have been found to be strongly associated with eating disturbed attitudes (Fryer et al., 1997). In addition, disturbed eating attitudes were found as directly related to stressors alone. Researchers found that self-esteem was an imperfect mediator, suggesting the presence of multiple mediating factors. In addition, research has shown that eating behavior can be used as a coping mechanism (Lacey, 1986; Root & Fallon, 1989).

Moreover, the level of body dissatisfaction and drive for thinness is growing among adolescent populations. These problems affect many areas of an adolescent's life and deserve closer investigation. Past research has shown adolescent females to have many problems with body image and more problems if they reach menarche early as opposed to on-time or late. Many stressors can coincide with the onset and maintenance of these disordered image problems as well as lead to the early onset of puberty, as suggested by Belsky et al.'s evolutionary theory. One of these stressors could be father absence. Further, if a girl experiences the loss of a father as a stressful upbringing (and the understanding that pair bonds are unstable), then according to Belsky et al.'s theory, she might manifest this by early pubertal development. If early pubertal development creates added stress for this adolescent girl, she may develop a drive for thinness and/or body dissatisfaction that may exacerbate the effects brought on by puberty. Thus
indirectly, father absence would be a related factor in the development of a dissatisfied body image and drive for thinness. Thus, the purpose of the current study was to determine the associations between the stressful absence of a father with the onset of puberty and between the early onset of puberty with disturbances in eating or body image in adolescent females. Specifically, the question was asked: Does father absence exacerbate body image distortion that is normally brought on by puberty? In addition, it was asked if negative body image and a drive for thinness occur if any one of those situations occurs or more so if they happen to coincide. Koenig, Gladstone (1998) found that synchronous life changes in adolescents can “translate into clear symptoms of depression” (p. 351) which could additionally lead to other symptoms of emotional distress such as eating disorders.

It seems that these outcomes are multifactorial in nature and that stress is a complex construct. The complexity underscores the need to understand stressors and pubertal development and the different pathways that they influence disturbed eating in adolescent girls. Although Belsky’s theory most likely has some merit, it is difficult to show that it is related to specific reproductive strategies. It does seem possible that the stress can create early menarche in girls, and father absence is most definitely an important stressor. Research has posited that when normative events occur at certain times, they can be a significant source of stress (Coleman, 1978, 1989).

Hypotheses

This researcher focused on the identification of the past and present family constitution of adolescent girls, onset of menarche, identification body image
dissatisfaction, and dieting methods. Specifically, this researcher looked at the relationship between father absence in childhood and adolescence and timing of onset of menarche. Second, it was important to investigate the relationship between early onset of menarche and levels of body dissatisfaction expressed by weight management behaviors and whether father absence plays a role in these problems.

It was hypothesized that in an adolescent female population, father absence affects the onset of menarche. It was also hypothesized that the early onset of menarche influences body image satisfaction in female adolescents. Specifically, the following hypotheses were formulated:

1. Adolescent girls who experience father absence would begin puberty earlier than girls whose fathers are present;

2. Adolescent girls who experience early puberty would exhibit a higher level of body dissatisfaction and use of dieting methods than girls who are characterized as on-time or late maturers;

3. Adolescent girls who experience father absence and early onset of puberty would be more likely to show a higher level of body dissatisfaction and use of dieting methods than girls who experience early onset of puberty without father absence; and

4. It was hypothesized that there should not be a direct relationship between father absence and body dissatisfaction/dieting behaviors.

Although the focus of this study was on the effects of father absence, and sociobiological models posit that it is specifically father absence and not parental absence
which affects pubertal status, it was investigated if mother absence does play a role for the onset of puberty and/or body dissatisfaction/dieting behaviors. Therefore, all pertinent hypotheses were re-conducted using mother absence instead of father absence; however, it was expected that none of the analyses with mother absence would yield significant results.
CHAPTER II

METHOD

The data used in this study were collected as part of the National Longitudinal Survey of Adolescent Health (NLSAH). The following information, regarding data collection procedures, is directly from the user’s guide manual (Kelley & Peterson, 1998). The United States Congress commissioned NLSAH to collect data to measure the social environmental influences on adolescent health. The data was released to the American Family Data Archive (AFDA), Sociometrics Corporation, for distribution to the public for research purposes. The purpose of the AFDA is "to facilitate access to the highest quality data sets on topics related to the family, family structure and change, family interaction, and family well being" (Kelley & Peterson, 1998, p. iv). Several of the variables of interest included diet and nutrition, pubertal status, depression, criminal activity, suicide, exercise, health service use, and family influence. For purposes of this study, only select variables of influence were investigated. The list of explanatory variables for the current study is presented in Appendix A.

The data was collected in two waves, although only data from Wave I is used for this study. Wave I data was collected between September 1994 and December 1995, using both in-home interviews and in-school assessments. Data from the in-home interviews was the only data used in this study. The in-home interviews consisted of
responses to a detailed interview of a subset of adolescents selected from the rosters of sampled schools and their parent, preferably mother, or parent-figure (Kelley & Peterson, 1998). The data used for this study consisted of up to 6,504 cases and contain as many as 5,800 variables.

Participants

Participants were male and female adolescents in grades 7 through 12 and one parent or parent-figure of each adolescent. For this study, only female adolescents were utilized. The sample, designed to be representative of the United States, was comprised of African American, Caucasian, Puerto Rican, Cuban, Chinese, Vietnamese, South Korean, Nicaraguan, Mexican American, Filipino, and Japanese ethnic groups.

Students forming the in-home data set were comprised from rosters of students from 80 eligible sampled schools, stratified by region, urbanicity, school type, ethnic mix, and size. Students in each school were also stratified by grade (7-12) and sex, with approximately 200 adolescents selected from each of the 80 schools (Kelley & Peterson, 1998). Although a total of 12,105 adolescents were interviewed, this researcher has access to only the public-use data, consisting of 6,504 cases. This data was released in a form specifically designed to minimize the possibility of obtaining identifying information about any individual; therefore, it was not necessary to obtain institutional review board approval.

Measures

The measures consisted of an in-school questionnaire, an in-home interview, and a parent interview. The in-home interview and the parent interview were employed for
this study. Data was collected at two different intervals due to the longitudinal nature of
the NLSAH Study. However, this researcher used only the information collected during
Wave I. The following information comes from the procedure manual of Kelley and

In-home interview (Wave I). Prior to the home interview, adolescents were given
the NLSAH Picture Vocabulary Test (AHPVT) which is a shorter, computerized version
of the Peabody Picture Vocabulary Test-Revised consisting of 78 items. Raw scores were
standardized by age. Next, all participants were given the same in-home interview, with
sessions occurring between April and December 1995. The in-home interview required
approximately 1-2 hours completion time, depending largely on the age and experiences
of the participant. The majority of the interviews were conducted in the participants’
homes.

All data were collected on laptop computers to preserve confidentiality. For less
sensitive topics, interviewers would orally present the question and then enter the
participant’s response into the computer. However, for more sensitive topic areas, the
participant listened with earphones to pre-recorded questions and entered the answers
directly (audio-CASI). Some of the topics included the following: health status, nutrition,
social networks, family dynamics, educational aspirations and expectations, criminal
activities, sexual partnerships, and substance use.

Parent questionnaire (Wave I). The parent of each participant, preferably the
adolescent’s mother, was asked to complete a paper and pencil questionnaire with
assistance from an interviewer. The questionnaire included such topics as marriages
and/or marriage-like relationships, neighborhood characteristics, involvement in
volunteer or civic activities, health-affecting behaviors, education and occupation, annual
income, parent-adolescent communication and interaction (Kelley & Peterson, 1998).

Definition of new variables. Many variables in the data set were combined or
reorganized to better suit the needs of the hypotheses. Please see Appendix B, which lists
all of the new variables computed as well as the procedure for obtaining each new
variable.
CHAPTER III

RESULTS

Sample Characteristics

Due to the nature of this study, data was analyzed from only the female adolescents in the study (n = 3356), rather than the entire available sample (n = 6504). As shown in Appendix C, Table 1, the mean age of the girls was 15.50 years (SD = 1.78), with a range of ages from 11 to 21 years. Approximately one-quarter of the sample experienced an early onset of puberty (26.9%), and 2,041 had a BMI score indicating body weight in the normal range. Almost half of the girls did not live with their biological father (47.1%), with more than one-third living without a father-figure in the home (38.0%). In contrast, the vast majority of girls lived with their biological mother (84.4%), and almost no girls lived without a mother-figure in the home (2.9%) (see Appendix C, Table 1).

Hypothesis Results

The first hypothesis tested stated that girls who experience biological father absence have an earlier onset of puberty. Consistent with this hypothesis, girls without a biological father in the home are significantly more likely to have an early onset of puberty (52.1%) than an on-time (47.1%) or late (44.8%) onset of puberty (X^2(1) = 10.23, p < .005) (see Appendix C, Table 2). Specifically, the odds ratio revealed that those adolescent females who experienced biological father absence had a 1.15 greater...
chance of beginning puberty earlier than her peers ($X^2(1) = 10.21, p < .005$).

The second set of hypotheses tested stated that adolescent girls who experience early puberty exhibit a higher level of body dissatisfaction, and greater use of dieting methods, than girls who are characterized as on-time or late maturers. As predicted by this hypothesis (see Appendix C, Table 3a), adolescent girls who experienced early puberty exhibited a higher level of body dissatisfaction (46%) than girls characterized as on-time (39%) or late maturers (34%) ($X^2(1) = 27.01, p < .0001$). Specifically, the odds ratio revealed that those girls who experienced early timing of puberty were 1.27 times more likely to be dissatisfied with their body ($X^2(1) = 26.85, p < .0001$). However, contrary to the prediction from this hypothesis, girls with early onset of puberty did not use more dieting methods than girls characterized as on-time or late ($X^2(1) = 1.24, p < .5$) (see Appendix C, Table 3b). Of note is that three-quarters of girls in the sample used some type of weight loss method.

Given the relationship between timing of puberty and body dissatisfaction, additional analyses were conducted to determine if girls with an early onset of puberty were heavier than their peers or simply more dissatisfied with their bodies. Results found that while 29.9% of girls with a late onset of puberty were overweight, 44.4% of girls with a late onset of puberty were underweight. Additionally, 47.1% of girls with an early onset of puberty were overweight, while 20.5% were underweight ($X^2(4) = 40.878, p < .001$) (see Appendix C, Table 4). Girls with an on-time onset of puberty were equally likely to be at any weight. Nevertheless, the relationship between body dissatisfaction and
timing remained significant ($\chi^2(1) = 4.47, p < .05$) even after accounting for BMI level ($\chi^2(1) = 232.05, p < .001$).

The third set of hypotheses to be tested suggested that of those girls with an early onset of puberty, those with a biological father absent are more likely to show a higher level of body dissatisfaction and greater use of dieting methods than girls with biological father in the home. Contrary to the hypothesis, girls with early puberty and a biological father present (81.2%) were more likely to use dieting methods than were early-onset girls with a biological father absent (72.9%) ($\chi^2(1) = 7.43, p < .01$) (see Appendix C, Table 5b). There was no significant difference in the amount of body dissatisfaction for girls with early puberty and a biological father present and for girls with early puberty and no biological father present ($\chi^2(1) = .001, p = 1.0$) (see Appendix C, Table 5a).

The fourth set of hypotheses suggested that there is no direct relationship between biological father absence and body dissatisfaction and dieting behaviors. As predicted by the hypothesis, no direct relationship was found between body dissatisfaction and biological father absence ($\chi^2(1) = 2.0, p < .2$) (see Appendix C, Table 6a). Although there was a significant relationship found between biological father absence and use of dieting behaviors, this relationship was in the opposite direction as expected, with girls with a biological father present being 1.29 times more likely to use a weight loss method than girls with a biological father absent (Wald $\chi^2(1) = 8.01, p < .005$) (see Appendix C, Table 6b). Again, nearly three-quarters of the girls used some sort of weight loss method.

Given that there was an unexpected relationship between use of weight loss methods and biological father presence, the analysis was recomputed using timing of
puberty as a covariate. These results suggested that the obtained relationship between a biological father in the home (Wald $X^2(1) = 13.57, p < .001$) and the use of weight loss methods was not altered due to the effects of timing of menstruation (Wald $X^2(1) = 1.69, p < .2$).

Also in an attempt to understand the current results, relationship quality between girls and their fathers was included in previously computed analyses as a covariate. Relationship quality was defined as agreeing or disagreeing to some extent that a girl feels she has a good relationship with her resident father (no resident dad; strongly agree; agree; neither agree no disagree; disagree; or strongly disagree; see Appendix B.

When the analysis between biological father absence and use of weight loss methods was recomputed covarying for father relationship quality, it was found that relationship quality was not significantly associated with use of weight loss methods (Wald $X^2(1) = .0426, p < .10$). However, father relationship quality did effect the relationship between body dissatisfaction and early puberty for girls who had a biological father absent, but only when body dissatisfaction was defined as actively trying to lose weight and/or feeling overweight. Specifically, results indicate that body dissatisfaction was significantly associated with a negative father relationship quality, (Wald $X^2(1) = 4.072, p < .05$) but not biological father presence for early maturing girls (Wald $X^2(1) = 1.2472, p = .26$). An inspection of the data shows that for early maturers, girls with a very negative relationship with their father (e.g., score of 5 on good relationship with father) were the most likely to be dissatisfied (63.2%) than satisfied (36.8%) with their bodies, followed by girls who report a negative relationship with their father (48.0% dissatisfied).
Girls who reported that they did not have a biological or nonbiological father in the home were as likely to be dissatisfied with their bodies (39.2% dissatisfied) as girls with a neutral relationship (40.7% dissatisfied), a good relationship (40.1% dissatisfied), or a very good relationship (39.2% dissatisfied) with their father.

The initial analyses were computed using the absence of a biological father. However, of the 1581 girls without a biological father in the home, 305 girls had another male in the home in place of their father. Thus, all analyses were recomputed comparing girls with a biological or non-biological father in the home (n = 2080) and girls without a father figure living in the home (n = 1276). The obtained results were similar to the results presented above; however, all logistic regressions yielded much weaker $X^2$ values.

The hypotheses presented were based from a theoretical model specifying biological father absence as the significant variable of interest. Although Belsky's model was not tested in its entirety, the general belief is that there is a specific relationship between girls' timing of menses and body image. To verify that the obtained results were specific to the absence of a biological father and not simply to the absence of a biological parent, all analyses were recomputed using absence of a biological mother or absence of a mother-figure in the home as the variable of interest. None of the analyses were significant, indicating that the absence of a biological mother or the absence of a mother figure in the home is not associated with timing of menses, body dissatisfaction, or use of weight loss methods.
CHAPTER IV

DISCUSSION

Results suggest that as predicted, girls without a biological father in the home are more likely to have an earlier onset of menses than an on-time or late onset. This seems to be specific to the absence of a biological father and not just a male in the home; however, as the strength of the relationship actually weakened when the 305 girls with a non-biological father in the home were considered to have a father present. This finding is consistent with Moffitt et al. (1992), supporting an earlier study by Belsky et al. (1991), which found that the absence of a biological father predicted an earlier age of menarche. In the current study, girls with no biological father present were 1.15 times more likely to have an early rather than on-time or late onset of puberty.

Previous research found the least satisfaction with weight among early maturing females (e.g., Brooks-Gunn, 1987; Caspi & Moffitt, 1991; Duncan et al., 1985; Simmons & Blyth, 1987). Consistent with these findings, as well as the hypotheses of the current study, girls with an early onset of menses report a greater dissatisfaction with their body. This finding remained significant after covarying for BMI level, despite the fact that almost half of girls with an early onset of puberty were overweight (44.4%) and almost half of girls with a late onset of puberty were underweight (47.1%). Although early maturing girls were as likely as on-time or later maturing girls to use a method of weight
loss, this nonsignificant result may be due the fact that 75% of the girls trying to lose weight or maintain their current weight reported using some form of weight loss method, despite 74% having a BMI level in the normal range.

These first two hypotheses tested were based on findings of early puberty and biological father absence. However, the purpose of the current study was to attempt to find a more direct relationship between biological father absence and body dissatisfaction and thus, the next two hypotheses attempted to discover the specific role of the absence of a biological father. Unfortunately, the hypothesis that girls with an early onset of puberty whose fathers are absent would be even more dissatisfied with their bodies and use more weight loss methods, was not supported. Stated differently, it appears that although girls without a father are more likely to have an early onset of puberty rather than an on-time or late onset, and although girls with an early onset are more dissatisfied with their bodies than girls who were on-time or late, the combination of early puberty and father absence was not significantly related to body dissatisfaction or weight loss methods.

Finally, as predicted, there was no direct relationship between the absence of a biological father and body dissatisfaction. However, there was a relationship between quality of the relationship with their father and body dissatisfaction; girls with a very negative relationship with their fathers were the most dissatisfied with their bodies, and those with a negative relationship also highly dissatisfied. Girls with no biological or non-biological father in the home were as likely to report dissatisfaction with their bodies as girls having a neutral, positive, or very positive relationship with their fathers. The
impact of a girl’s bad relationship with her father could point to a relationship between negative body image and lack of a psychological attachment with a father. The need for this attachment, and lack thereof, could color how the girl views herself and her body, negatively. It is possible that a girl may feel that she is not good enough if she does not have a good relationship with her father, and this feeling translates into other parts of her belief system about herself as well.

Given the large sample size and the stringent procedure used by the National Longitudinal Survey of Adolescent Health (NLSAH) to collect data, it is likely that the results obtained are a good test of the proposed hypotheses. Thus, it is surprising that the hypothesis that girls with early puberty who also have a biological father absent would report more dissatisfaction with their bodies was not supported. However, it is interesting that girls with a negative relationship with their fathers are more likely to be dissatisfied with their bodies than girls with a biological father absent. Thus, there is evidence that fathers do play a role in their daughters’ view of their own bodies, but not in the ways expected.

Although Moffitt et al. (1992) found sharper contrasts between biological father absence for girls with an early, on-time, or late onset of puberty (49.4%, 33.2%, and 24.4%, respectively), the current findings also show the absence of a biological father for half of the girls with an early onset of puberty (52.1%), compared to on-time (47.1%) or late onset (44.8%) girls. One explanation for this finding may be that Belsky’s model is correct and girls with an absent biological father enter puberty earlier in order to enhance their reproductive strategies. However, acceptance of this interpretation may be
premature, given that several social, environmental, and biological aspects may influence the current results.

First, pubertal timing is in part genetically determined, thus it may be that girls in this study experienced an early onset of puberty because their mothers' also experienced an early onset. Although timing of puberty was not available for mothers in the current study, previous results have found menarcheal timing as highly heritable (Garn, 1980; Plomin & Fulkner, 1987). Thus, it is possible that much of the variance for timing of menstruation for the girls in the sample may be due to maternal pubertal timing rather than father absence.

Second, it may simply be the stress of having a biological father leave which is related to a girl's earlier onset of menses. However, the addition of a step-father or other father-figure would be expected to also be stressful. Given that the obtained results were stronger when nonbiological fathers were considered as "father present" rather than "father absent," this possible interpretation may be less plausible.

A third potential explanation for the finding that girls without a biological father were more likely to have an early onset of menses is that there may be a relationship between biological and situational factors. For example, Frick et. al (1991) found that maternal antisocial behavior was more likely to predict her own teenage pregnancy and her sons' antisocial behaviors and that there was no direct relationship between teen pregnancy and child conduct problems. In addition, research has shown that mothers with antisocial and sensation-seeking tendencies tend to enter relationships with antisocial men (e.g., Frick, Kuper, Silverthorn, & Cotter, 1995). Thus, it could be that antisocial
mothers are more likely to have an early onset of puberty and to bear children by antisocial men who are more likely to leave the family, thereby accounting for the relationship between early pubertal development and father absence for teen girls. Again, due to restrictions of the data, this hypothesis could not be tested in the current study.

There were several limitations of the current study, which may effect the interpretation of the results. First, although many of the findings are statistically significant, many may be of limited clinical significance. For example results from the current study showed that girls with an early onset of puberty were more likely to have a biological father absent (52.1%) than present (47.9%), whereas this pattern was reversed for girls with an on-time (47.1% and 52.9%, respectively) or late onset of puberty (55.2% and 44.8%, respectively). In addition, of girls with a biological father absent, only one-third actually experienced early menstruation. Although clinically significant, these percentages are close enough to warrant question of their clinical significance.

Second, certain variables needed to test alternatives to Belsky's model were not available in the current data set. For example, Belsky looked at the combination of pubertal timing, sexual activity, and pair bonding. Sufficient data on long-term pair bonding was not available in the current sample. In addition, Belsky assumed an evolutionary perspective in relation to humans varying their mating and child-rearing behavior to maximize these potentials in whichever context they had been raised. Again, although we had measures of sexual activity, the current data set did not include complete information on mating (dating or marriage) and child-rearing for the entire sample. Similarly, we had limited measures of the context of infancy/early childhood rearing
other than information on having lived with or without a parent and the last year lived with them.

Third, the impact of relationship with both parents or aspects of the parental relationship with the adolescent girls was not tested in the current study, which has been found to be a factor in pubertal onset in previous studies and also in Belsky’s study (e.g., Steinberg, 1988). Although the aim of the current study was to focus on father absence in particular, it also looked at mother absence and relationship with mother. However, it was the combination that was not focused on in this study, which may have offered important additional information.

In summary, the obtained results in the current study offer important contributions to the literature on body image, timing of puberty, and absence of a biological father. Girls who do not have a biological father in the home, regardless of whether there is a stepfather in the home, were more likely to have an early onset of puberty than an on-time or late onset of puberty. In addition, girls with an early onset of puberty were more likely to be overweight than underweight or of normal weight, and were more likely to be overweight than their on-time or later onset peers. Furthermore, although there was not a direct relationship between the absence of a biological father and body dissatisfaction, there was a relationship between quality of relationship with a biological or nonbiological father and body dissatisfaction. None of these findings occurred when the biological mother was absent, and it did not appear to matter if there was a stepfather in the home.

Taken together, there appears to be ample evidence to continue to investigate the role that the absence of a biological father plays in adolescent female development.
Future research should focus on more complex relationships between the variables of interest, using a structural equation model to determine whether or not biological father absence plays a mediating or moderating role in the relationship between early puberty and body dissatisfaction. It would also be important to understand the impact of parental relationships with each other on a girl's pubertal timing, body dissatisfaction, and use of dieting behaviors. Further, the difference, if any, found in the mother when the father is either in the home or absent and subsequently, and effect on the adolescent girl warrants investigation. In addition, assessing additional parental variables, including maternal pubertal timing, early childhood rearing practices, later pair-bonding, and parental personality and behavioral characteristics would allow for the interpretation of alternates to the Belsky model. Finally, the field would be improved if researchers investigated if there are effects of biological father absence for adolescent males. The importance of the current findings could be further enhanced with future studies.
APPENDIX A

SUMMARY OF RESPONSE AND EXPLANATORY VARIABLES FROM THE ADOLESCENT AND PARENT QUESTIONNAIRE
<table>
<thead>
<tr>
<th><strong>Response Variable</strong></th>
<th><strong>Explanatory Variables</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>What is your birth date?</td>
</tr>
<tr>
<td></td>
<td>So, you are {AGE} years old, then?</td>
</tr>
<tr>
<td>Race</td>
<td>What is your race? You may give more than one answer.</td>
</tr>
<tr>
<td>Grade</td>
<td>What grade {ARE/WERE} you in?</td>
</tr>
<tr>
<td>Pubertal Status</td>
<td>How old were you when you had your very first menstrual period?</td>
</tr>
<tr>
<td></td>
<td>How advanced is your physical development compare to other girls your age?</td>
</tr>
<tr>
<td>Father Absence</td>
<td>Did you ever live with him (your biological dad)?</td>
</tr>
<tr>
<td></td>
<td>How old were you when you last lived with him (biological dad)?</td>
</tr>
<tr>
<td></td>
<td>For how many years had you been living with him (biological dad) at that point?</td>
</tr>
<tr>
<td>Body Size</td>
<td>BMI calculated from: What is your height? What is your weight?</td>
</tr>
<tr>
<td></td>
<td>(Underweight: &lt;18.5; “Normal”: 18.5-24.9; Overweight: 25.0-29.9; Obesity: 30-34.9 and 35-39.9; Extreme obesity: &gt;=40).</td>
</tr>
<tr>
<td>Body Dissatisif.</td>
<td>How do you describe yourself in terms of weight? (very underweight; slightly underweight; about the right weight; slightly overweight; very overweight)</td>
</tr>
<tr>
<td></td>
<td>Are you trying to lose weight, gain weight, or stay the same weight?</td>
</tr>
<tr>
<td>Response Variable</td>
<td>Explanatory Variables</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Dieting Behaviors</td>
<td>During the last 7 days, which of the following things did you do in order to lose weight or to keep from gaining weight? (diet; exercise; made yourself vomit; took diet pills; took laxatives; other; none)</td>
</tr>
<tr>
<td>Mother Absence</td>
<td>Did you ever live with her (your biological mom)?</td>
</tr>
<tr>
<td></td>
<td>How old were you when you last lived with her (biological mom)?</td>
</tr>
<tr>
<td></td>
<td>For how many years had you been living with her (biological mom) at that point?</td>
</tr>
</tbody>
</table>
APPENDIX B

SUMMARY OF NEW VARIABLES COMPUTED AND DETAILED DESCRIPTION
OF SYNTAX USED
Variable Description

Dad1, Dad2, or Dad3 If parent 1, 2, or 3 is identified as biological father.

Dadtype If dad 1, 2, or 3 is biological father = dadtype 1 (biological father present).
   If dad 1, 2, or 3 is any other father "type" = dadtype 2 (non-biological father present).
   If no male is listed for dad 1, 2, or 3 = dadtype 3 (no male present).

Nobiodad If dadtype 1, then nobiodad = 1 (biological father present).
   If dadtype 2 or dadtype 3, then nobiodad = 2 (biological father absent).

Nodad If dadtype 1 or dadtype 2, then nodad = 1 (father present).
   If dadtype 3, then nodad = 2 (father absent).

Erlygrlb This variable indicates biofather presence for girls with early menarche.
   If timing is early and nobiodad = 1 (biological father present), then
      erlygrlb = 1 (early with biological father present).
   If timing is early and nobiodad = 2 (biological father absent), then erlygrlb
      = 2 (early with biological father absent).

Erlygrl This variable indicates biological and non-biological father presence for
girls with early menarche.
   If timing is early and nodad = 1 (father present), then erlygrl = 1 (early
      with biological father or non-biological father present).
   If timing is early and nodad = 2 (father absent), then erlygrl = 2 (early
      with biological father or non-biological father absent).

Mom1, Mom2, or Mom3 If parent 1, 2, or 3 is identified as biological mother.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
</table>
| Momtype  | If mom 1, 2, or 3 is biological mother = momtype 1 (biological mother present).  
If mom 1, 2, or 3 is any other mother "type" = momtype 2 (non-biological mother present).  
If no male is listed for mom 1, 2, or 3 = momtype 3 (no female present). |
| Nobiomom | If momtype 1, then nobiomom = 1 (biological mother present).  
If momtype 2 or momtype 3, then nobiomom = 2 (biological mother absent). |
| Nomom    | If momtype 1 or momtype 2, then nomom = 1 (mother present).  
If momtype 3, then nonmom = 2 (mother absent). |
| Erlygrld | This variable indicates biomother presence for girls with early menarche.  
If timing is early and nobiomom = 1 (biological mother present), then erlygrld = 1 (early with biological mother present).  
If timing is early and nobiomom = 2 (biological mother absent), then erlygrld = 2 (early with biological mother absent). |
| Erlygrlc | This variable indicates biological and non-biological mother presence for girls with early menarche.  
If timing is early and nomom = 1 (mother present), then erlygrlc = 1 (early with biological mother or non-biological mother present).  
If timing is early and nomom = 2 (mother absent), then erlygrlc = 2 (early with biological mother or non-biological mother absent). |
<p>| Percept1 | If self-perception of weight is very underweight or slightly underweight, then percept1 = 1 (underweight). |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI Level</strong></td>
<td>BMI was computed by multiplying the individual's current weight by 700 (bmi1) and current height by 12 (bmi2), then adding in current inches to get total height in inches (bmi3). Next, bmi1 was divided by bmi3 (bmi4), and finally bmi 4 was divided by bmi3 (bmi). If bmi is less than 18.5, then bmi = 1 (underweight). If bmi is between 18.5 and 24.9, then bmi = 2 (normal weight). If bmi is equal to or greater than 30, then bmi = 3 (overweight).</td>
</tr>
<tr>
<td><strong>Timing</strong></td>
<td>Menarche by age 11 or younger, then timing is early. Menarche at age 12, then timing is on-time. Menarche at age 13 or older, then timing is late.</td>
</tr>
<tr>
<td><strong>Wtchange</strong></td>
<td>Weight change was determined by indication of trying to lose, gain, or maintain the same weight. If trying to lose weight, then wtchange = 1. If trying to gain weight, then wtchange = 2. If trying to stay the same weight, then wtchange = 3. If not trying to change weight, then wtchange = 4.</td>
</tr>
<tr>
<td><strong>Bodydis1</strong></td>
<td>Body dissatisfaction was determined by a combination of self-perception of weight and if a girl was trying to lose, gain, or maintain weight.</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>bodydisl</td>
<td>If self-perception of weight is overweight or if the girl is trying to lose weight or maintain the same weight, then bodydisl = 2 (dissatisfied). If self-perception of weight is underweight or about the right weight, or the girl is trying to gain weight or not trying to change weight, then bodydisl = 1 (not dissatisfied).</td>
</tr>
<tr>
<td>anyloss</td>
<td>If a girl indicated that she uses dieting, exercise, vomiting, diet pills, laxative, or other as a weight loss method, then anyloss = 2 (use of diet, exercise, vomit, diet pills, laxative, other). If a girl indicated that she did not use dieting, exercise, vomiting, diet pills, laxative, or other as a weight loss method, then anyloss = 1 (no method).</td>
</tr>
<tr>
<td>Lom</td>
<td>Length of menstruation - how long since a girl reached menarche. This was calculated by subtracting menstruation age (first period) from agewavel (a girl’s current age).</td>
</tr>
<tr>
<td>bdadyrs</td>
<td>How many years has the girl lived with her biological father? This variable used the existing variable which was responded to by girls whose father is not a member of her current household. If the girl listed no years with a biological father and had a biological father present, then bdadyrs = 0 (always lived with biological father). If the girl listed years lived with biological father as less than a year and had a non-biological father or no male present, then bdadyrs = 1 (lived with biological father 1 year or less).</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>If the girl listed years lived with biological father as between 1 and 5 years and had a non-biological father present or no male present, then</td>
</tr>
<tr>
<td></td>
<td>( \text{bdadyrs} = 2 ) (lived with biological father 1 to 5 years).</td>
</tr>
<tr>
<td></td>
<td>If the girl listed years lived with biological father as between 6 and 10 years and had a non-biological father present or no male present, then</td>
</tr>
<tr>
<td></td>
<td>( \text{bdadyrs} = 3 ) (lived with biological father 6 to 10 years).</td>
</tr>
<tr>
<td></td>
<td>If the girl listed years lived with biological father as between 11 and 15 years and had a non-biological father present or no male present, then</td>
</tr>
<tr>
<td></td>
<td>( \text{bdadyrs} = 4 ) (lived with biological father 11 to 15 years).</td>
</tr>
<tr>
<td></td>
<td>If the girl listed years lived with biological father as more than 16 years and had a non-biological father present or no male present, then</td>
</tr>
<tr>
<td></td>
<td>( \text{bdadyrs} = 5 ) (lived with biological father 16 years or more).</td>
</tr>
<tr>
<td>Agewbdad</td>
<td>Girl's last age she lived with biological father. The current variable was combined into different groups by years lived with biological father.</td>
</tr>
<tr>
<td></td>
<td>If a girl did not list an age last lived with her biological father and her biological father is present, then ( \text{agewbdad} = 0 ) (always lived with biological father).</td>
</tr>
<tr>
<td></td>
<td>If a girl listed age last lived with her biological father as less than a year, then ( \text{agewbdad} = 1 ) (less than one year).</td>
</tr>
<tr>
<td></td>
<td>If a girl listed age last lived with her biological father between 1 and 5 years, then ( \text{agewbdad} = 2 ) (1 to 5 years).</td>
</tr>
<tr>
<td></td>
<td>If a girl listed age last lived with her biological father between 6 and 10 years, then ( \text{agewbdad} = 3 ) (6 to 10 years).</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>agewbdad</td>
<td>If a girl listed age last lived with her biological father between 11 and 15 years, then agewbdad = 4 (11 to 15 years). If a girl listed age last lived with her biological father as greater than 16 years, then agewbdad = 5 (16 years and older).</td>
</tr>
<tr>
<td>cls2bdad</td>
<td>The variable close to biological father was created by recoding an existing variable. cls2bdad = 1 (extremely close). cls2bdad = 2 (quite close). cls2bdad = 3 (somewhat close). cls2bdad = 4 (not very close). cls2bdad = 5 (not close at all).</td>
</tr>
<tr>
<td>dadgrel</td>
<td>The variable good relationship with resident dad was created by recoding an existing variable. dadgrel = 0 (no resident dad). dadgrel = 1 (strongly agree). dadgrel = 2 (agree) dadgrel = 3 (neither agree nor disagree). dadgrel = 4 (disagree) dadgrel = 5 (strongly disagree).</td>
</tr>
</tbody>
</table>
APPENDIX C

TABLES
Table 1

**Demographic Information for the Sample**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (std dev)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (Percentage)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>15.50 (1.78)</td>
<td>11 – 21</td>
</tr>
<tr>
<td>Grade</td>
<td>9.54 (1.68)</td>
<td>7 – 12</td>
</tr>
<tr>
<td>7th</td>
<td>507 (15.1%)</td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td>517 (15.4%)</td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td>567 (16.9%)</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>582 (17.3%)</td>
<td></td>
</tr>
<tr>
<td>11th</td>
<td>544 (16.2%)</td>
<td></td>
</tr>
<tr>
<td>12th</td>
<td>546 (16.3%)</td>
<td></td>
</tr>
<tr>
<td>Race:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>1,949 (58.1%)</td>
<td></td>
</tr>
<tr>
<td>African-Am.</td>
<td>743 (22.1%)</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>124 (3.7%)</td>
<td></td>
</tr>
<tr>
<td>Native American</td>
<td>188 (5.6%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>346 (10.3%)</td>
<td></td>
</tr>
</tbody>
</table>

(table continues)
## Demographic Information for the Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (std dev)/N (Percentage)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>515 (15.3%)</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>2,041 (60.8%)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>203 (6.0%)</td>
<td></td>
</tr>
<tr>
<td><strong>Pubertal Status:</strong></td>
<td></td>
<td>11.96 - 42.12</td>
</tr>
<tr>
<td>Early</td>
<td>901 (26.9%)</td>
<td></td>
</tr>
<tr>
<td>On-Time</td>
<td>971 (28.9%)</td>
<td></td>
</tr>
<tr>
<td>Late</td>
<td>1120 (33.4%)</td>
<td></td>
</tr>
<tr>
<td>No menstruation</td>
<td>364 (10.8%)</td>
<td></td>
</tr>
<tr>
<td><strong>Father Status:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological</td>
<td>1775 (52.9%)</td>
<td></td>
</tr>
<tr>
<td>Non-Biological</td>
<td>305 (9.1%)</td>
<td></td>
</tr>
<tr>
<td>No Father</td>
<td>1276 (38.0%)</td>
<td></td>
</tr>
<tr>
<td><strong>Mother Status:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological</td>
<td>2833 (84.4%)</td>
<td></td>
</tr>
<tr>
<td>Non-Biological</td>
<td>427 (12.7%)</td>
<td></td>
</tr>
<tr>
<td>No Mother</td>
<td>96 (2.9%)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: BMI = Body Mass Index*
Table 2

Logistic Regression for Father Absence and Onset of Menarche

<table>
<thead>
<tr>
<th>Timing of Menarche</th>
<th>Bio dad present</th>
<th>Bio dad absent</th>
<th>Wald $X^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>(n = 2,992)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>($\leq 11$ years)</td>
<td>432</td>
<td>47.9%</td>
<td>469</td>
<td>52.1%</td>
</tr>
<tr>
<td>On-Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(age 12)</td>
<td>514</td>
<td>52.9%</td>
<td>457</td>
<td>47.1%</td>
</tr>
<tr>
<td>Late</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>($&gt;1 = 13$ years)</td>
<td>618</td>
<td>55.2%</td>
<td>502</td>
<td>44.8%</td>
</tr>
</tbody>
</table>

***p < .005.
Table 3a

**Logistic Regression for Early Puberty with Body Dissatisfaction**

<table>
<thead>
<tr>
<th>Timing of Menarche</th>
<th>Body Dissatisfied:</th>
<th>Body Dissatisfied:</th>
<th>Wald $\chi^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Dissatisfied</td>
<td>Dissatisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>(n = 2,992)</td>
<td>1,824</td>
<td>61.0%</td>
<td>1,168</td>
<td>39.0%</td>
</tr>
<tr>
<td>Early</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&lt;/ = 11 years)</td>
<td>490 54.4%</td>
<td>411 45.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(age 12)</td>
<td>597 61.5%</td>
<td>374 38.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&gt;/&gt; = 13 years)</td>
<td>737 65.8%</td>
<td>383 34.2%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Body Dissatisfied = Body Dissatisfaction.

****p < .0001.
Table 3b

**Logistic Regression for Early Puberty with Any Weight Loss Method**

<table>
<thead>
<tr>
<th>Timing of Menarche</th>
<th>Weight Loss: No Methods used</th>
<th>Weight Loss: Methods used</th>
<th>Wald X^2</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>(n = 2,447)</td>
<td>603</td>
<td>24.6%</td>
<td>1,844</td>
<td>75.4%</td>
</tr>
<tr>
<td>Early</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&lt; 11 years)</td>
<td>176</td>
<td>23.1%</td>
<td>587</td>
<td>76.9%</td>
</tr>
<tr>
<td>On-Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(age 12)</td>
<td>202</td>
<td>25.2%</td>
<td>599</td>
<td>74.8%</td>
</tr>
<tr>
<td>Late</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&gt; 13 years)</td>
<td>225</td>
<td>25.5%</td>
<td>658</td>
<td>74.5%</td>
</tr>
</tbody>
</table>
Table 4

Chi-Square for Puberty and Body Mass Index Score

<table>
<thead>
<tr>
<th>Timing of Menarche</th>
<th>Early ($&lt;11$ years)</th>
<th>On-Time (age 12)</th>
<th>Late ($&gt;13$ years)</th>
<th>Wald $X^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 2,455)</td>
<td>n  %</td>
<td>n  %</td>
<td>n  %</td>
<td>40.88</td>
<td>****</td>
</tr>
<tr>
<td></td>
<td>694 28.3%</td>
<td>809 33.0%</td>
<td>952 38.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Underweight

| (BMI < 18.5)       | 84 20.5%            | 133 32.4%        | 193 47.1%        |

Normal Weight

| (BMI = 18.5 - 24.9)| 527 28.4%           | 628 33.8%        | 703 37.8%        |

Overweight

| (BMI $>25.0$)      | 83 44.4%            | 48 25.7%         | 56 29.9%         |

****p < .001.
Table 5a

Logistic Regression for Early Onset of Puberty, Father Absence, and Body Dissatisfaction

<table>
<thead>
<tr>
<th>Biological father presence for girls with early menarche</th>
<th>Body Dissatisf.: Not Dissatisfied</th>
<th>Body Dissatisf.: Dissatisfied</th>
<th>Wald $X^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 901)</td>
<td>490 54.4%</td>
<td>411 45.6%</td>
<td>.001</td>
<td>NS</td>
</tr>
</tbody>
</table>

Early puberty/

| Biological father present | 235 54.4% | 197 45.6% |

Early puberty/

| Biological father absent  | 255 54.4% | 214 45.6% |

Table 5b

Logistic Regression for Early Onset of Puberty, Father Absence, and Weight Loss

<table>
<thead>
<tr>
<th>Method</th>
<th>Biological father present</th>
<th>Weight Loss: No Methods used</th>
<th>Weight Loss: Methods used</th>
<th>Wald $X^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early puberty/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological father present</td>
<td>70</td>
<td>18.8%</td>
<td>302</td>
<td>81.2%</td>
<td></td>
</tr>
<tr>
<td>Biological father absent</td>
<td>106</td>
<td>27.1%</td>
<td>285</td>
<td>72.9%</td>
<td></td>
</tr>
</tbody>
</table>

**p < .01.
Table 6a

Logistic Regression for Father Absence and Body Dissatisfaction

<table>
<thead>
<tr>
<th>Biological father presence</th>
<th>Body Dissatisf.:</th>
<th>Body Dissatisf.:</th>
<th>Wald $X^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Dissatisfied</td>
<td>Dissatisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$n$</td>
<td>$n$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$%$</td>
<td>$%$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 3,353)</td>
<td>2,084 62.2%</td>
<td>1,269 37.8%</td>
<td>1.99</td>
<td>NS</td>
</tr>
<tr>
<td>Biological father present</td>
<td>1,123 63.3%</td>
<td>652 36.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological father absent</td>
<td>961 60.9%</td>
<td>617 39.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6b

**Logistic Regression for Father Absence and Weight Loss Method**

<table>
<thead>
<tr>
<th>Biological father presence</th>
<th>Weight Loss: No Methods used</th>
<th>Weight Loss: Methods used</th>
<th>Wald $X^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>(n = 2,715)</td>
<td>679</td>
<td>25.0%</td>
<td>2,036</td>
<td>75.0%</td>
</tr>
<tr>
<td>Biological father present</td>
<td>331</td>
<td>22.8%</td>
<td>1,120</td>
<td>77.2%</td>
</tr>
<tr>
<td>Biological father absent</td>
<td>348</td>
<td>27.5%</td>
<td>916</td>
<td>72.5%</td>
</tr>
</tbody>
</table>

***$p < .005$.|||
REFERENCES


