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Relationships among socio-economic status, parenting, academic achievement, and self-esteem in early and middle adolescence: A longitudinal study

by

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in partial fulfillment of the requirements for the degree of

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ABSTRACT

The purposes of this dissertation are threefold: first, to examine a model of how socioeconomic status, parenting, adolescents' academic achievement, and adolescents' self-esteem might be causally related; second, to examine whether or not the proposed model is structurally invariant across gender and grade; and third, to determine whether family income, paternal and maternal education, and paternal and maternal occupational prestige make unique contributions to nurturant and punitive parenting, adolescents’ academic achievement, and self-esteem. Structural equation results showed that socioeconomic status has a significant and positive effect on nurturant parenting and on adolescents’ academic achievement, which, in turn, affect adolescent self-esteem. MANOVA results showed a gender effect for academic achievement and a grade effect for parenting. Multiple regression results found a significant effect of parental education on adolescents’ academic achievement. Possible future research directions and implications are discussed.
CHAPTER 1. INTRODUCTION

The purposes of this longitudinal study are threefold. The first purpose of the study is to investigate a particular model of how socioeconomic status, parenting, adolescents’ academic achievement, and adolescents’ self-esteem might be causally related. A full structural equation model will be evaluated, in which SES is hypothesized to have a direct effect on parenting, on adolescents’ academic achievement, and on adolescents’ self-esteem, as well as indirect effects on adolescents’ self-esteem through parenting and adolescents’ academic achievement.

The second purpose of the study is to investigate whether or not gender acts as a moderator in the relationships among SES, parenting, academic achievement, and self-esteem. Thus, the study will examine whether or not the relationships among SES, parenting, adolescent academic achievement, and adolescent self-esteem are invariant across gender.

The third purpose of the study is to investigate whether or not parental income, parental education, and parental occupation make unique contributions to parenting, adolescent academic achievement, and adolescent self-esteem.

Theoretical perspectives and empirical studies on the relationships among socioeconomic status, parenting, academic achievement, and self-esteem will be reviewed in the next section.
Theoretical Framework

Bronfenbrenner’s bioecological theory

Up to 1986 Bronfenbrenner introduced the bioecological theory in several lectures, presentations, and symposia. In 1986 a book chapter on the theory was published. The bioecological model is distinguished from the earlier ecological model in several ways. In Bronfenbrenner’s ecological model (Bronfenbrenner, 1986), a child’s experience is embedded within four levels of the environment: the microsystem, the mesosystem, the exosystem, and the macrosystem. The microsystem contains the processes (interactions and activities) that promote or inhibit development; for instance, the child’s self-esteem is affected by what parents say to him; another example is that TV viewing can reduce the amount of parent-child interaction, which may influence the child’s behavior and cognitive development. The mesosystem includes processes occurring between two or more Microsystems containing the developing person; for instance, the children’s school performance is affected by the parent-child relationship at home. The exosystem contains the processes occurring between two or more environments, one of which does not include the developing person; an example would be that the child’s school performance may be affected by parental problems in their workplace. Lastly, the macrosystem is the overall cultural milieu that contains the microsystem, the mesosystem, and the exosystem; for example, how a society values the importance of sports may affect how parents arrange their children’s leisure time. Bronfenbrenner (1979) referred to the ecological environment as “a set of nested structures (p.3)”. In the bioecological model Bronfenbrenner (1986) added a fifth level of environment, that is, the chronosystem. The chronosystem refers the time dimension involved in unfolding developmental processes. For interactions between the developing
person and his or her physical and social environment to have an effect on development,
these interactions “must occur on a fairly regular basis over extended periods of time”
(Bronfenbrenner, 1998, p. 996). In addition to adding the chronosystem, another change in
the bioecological as compared to the ecological model includes the Process-Person-Context-
Time model.

Based on the bioecological theory, developmental processes are a joint function of
biological and environmental factors. He proposes the Process-Person-Context-Time Model
(PPCT) for developmental processes. Process is the first component and the core of the
model. This construct comprises all proximal processes that refer to the interaction between
an organism and the environment. The form, power, content, and direction of the proximal
processes (PROCESS) are a function of the characteristics of the developing person
(PERSON), the immediate and remote environments (CONTEXT), the nature of the
developmental outcomes, and the social continuities and changes occurring over time
(TIME). In his model, the processes refer to the interaction with people, objects, or symbols.
The interaction must occur over time. Several examples of processes are reading to the baby,
feeding the baby, playing with the child, performing complex tasks, and learning new things.
Person characteristics consist of three types: forces, resourses and demands. Forces refer to
dispositions that can either instigate or retard the proximal processes are developmentally
generative and developmentally disruptive characteristics, respectively. Developmentally
generative characteristics include curiosity, responsiveness, initiation or engagement in
activity, and readiness to pursue long-term goals; developmentally disruptive characteristics
involve impulsiveness, distractibility, apathy, inattentiveness, unresponsiveness or shyness.
Resource characteristics are of two types—biopsychological liabilities and assets. Examples
of biopsychological liabilities are genetic defects, low birthweight or physical handicaps that could limit the ability of the organism to function effectively and efficiently in proximal processes. Examples of developmental assets are knowledge, skill or experiences that could instigate the proximal processes. The last set of Person characteristics affecting development are demand characteristics. Demand characteristics refer to attributes such as an attractive versus unattractive physical appearance, or hyperactivity versus passivity. These characteristics influence development by eliciting reactions from the social environment that are either favorable or unfavorable for development. An example of such demand characteristics can be found in Elder’s study of Great Depression in which he found that economic hardship increased the fathers’ rejecting behavior mainly towards unattractive daughters (Elder, Nguyen, & Caspi, 1985).

In their study of preschoolers, Tudge and others (1996) applied the PPCT ecological models to the relationships between everyday activities (Process) of preschoolers (Person) and their teachers’ perceptions of their competence in the first years of school. Children were from either middle-class or working-class families (Context). They were observed before entry into the elementary school (Time 1) and after entry into elementary school (Times 2 and 3). They found that middle-class preschoolers engaged in more school-relevant activities, and teachers perceived children who initiated more conversations as more competent than other children who did not initiate conversations.

In what in the context of Bronfenbrenner’s theory would be called an ecological study, Maccoby (1951) investigated the impact of TV viewing on social interaction and physical proximity. She found that watching TV brought the family together (physical presence), but decreased the time children played with playmates and the time spent reading
and interacting with other family members. Hayes and Grether’s study (1983) focused on the impact of meso-level settings on children’s Metropolitan Achievement Tests (MAT). In their study of second graders over four summer vacations, students from ghetto schools lagged behind students from rich schools after four summer vacations. At the beginning of second grade, students from the rich schools performed better in reading than did students from the ghetto schools, but both were at the same level in word knowledge. By the end of sixth grade, there was a 2.8-year gap in word knowledge between the richest and poorest schools and there was a 2.7-year gap in reading between white and non-white achievement. Their findings suggested that not only do teachers, principals, or other school-related factors affect students’ learning (word knowledge and reading), but also that other environmental factors (affluent neighborhood and minority schools) influence the variations of academic achievement. In another study by Brooks-Gunn, Duncan, Klebanov, and Sealand (1993), the findings indicated that children who grew up in affluent neighborhoods did better than children who grew up in poor neighborhoods, even after controlling for family-level differences (family structure and economic resources). Their findings suggest that neighborhoods impact children’s development via collective socialization, in which neighborhood role models and monitoring influences a child’s socialization.

By studying the effect of maternal employment as an exosystem on developmental processes, Mathews (1934) included not only the child and the mother, but also the father in her study. Many working mothers in her study who worked as much as ten or eleven hours a day did not have time to make breakfast for their child. The fathers were less active in the home and few of them participated in playing games with their child or took childcare responsibilities. In their study of three-to four-year-olds in the National Longitudinal Survey
of Youth, Han, Waldfogel, and Brooks-Gunn (2001) found that maternal employment when the children were one year old negatively influenced white children’s cognitive outcomes and behavioral problems when the children were seven years old.

Using Bronfenbrenner’s (1986) ecological model, Meschke and Silbereisen (1998) examined the effects of the macrosystem (nation and gender) and microsystem (childhood play and parent-adolescent interaction) on 221 adolescents’ (aged fifteen to eighteen years) leisure activities (risky, social-romantic, and creative-introspective) in west and east Germany. Gender was used as a proxy measurement of gender socialization. Risky leisure activities include having a fight, enjoying riding public transportation without paying, listening to loud music, shoplifting, gambling, provoking older people, and staying away from home without telling family. Social-romantic activities include flirting, being with friends/boyfriends/girlfriends, listening to music, dancing, and going to parties. Creative-introspective leisure activities include painting or drawing, talking, taking a photography class, walking, making window displays, reading, participating in cultural activities, going to a classical music concert, writing a personal letter or in a diary, or dreaming about the future. Their findings showed that 1) females participated in more social-romantic leisure and creative-introspective activities than did males; and 2) west German adolescents participated in more risky leisure activities than did east German adolescents. The research studies above showed how the environmental systems (macrosystem, exosystem, mesosystem, and microsystem) influenced children’s developmental outcomes.

In Bronfenbrenner’s bioecological theory, socioeconomic indicators (family income, the father’s and the mother’s education, and the father’s and the mother’s occupational prestige) refer to exosystem and parenting refers to microsystems. By applying
Bronfenbrenner’s PPCT model, this dissertation will examine the effects of parent-adolescent relationships (PROCESS) on academic achievement and self-esteem in early- and middle-adolescence (PERSON) from different levels of social class (CONTEXT) (as defined as a composite measure of family income, paternal and maternal education, and occupational prestige) during three years of study (TIMES 1, 2, and 3).

**Elder’s life-course theory**

Elder’s life-course theory (Elder, 1998) shares many concepts with Bronfenbrenner’s (1986) bioecology of human development, including micro to macro levels of environment (Goldhaber, 2000). The theory has four major themes: the interplay of human lives and historical times, the timing of lives, the linking or interdependence of lives, and human agency in decision making. Elder is interested in demonstrating how different age groups respond differently to the same historical events. For example, in his research on the effects of the Great Depression with two birth cohorts (younger Berkeley and older Oakland cohorts), Elder found that older Oakland cohorts were old enough to help their families and they had a sense of human agency and purpose of lives, whereas the younger Berkeley cohorts were too young to help their families.

Elder also wants to know how social timing affects the impact of experienced events. Social timing is defined as how socially accepted roles should play in a particular context; for example, when should people get married and when should they have children after marriage. Another example is that girls and boys who mature biologically earlier or later than normal may have different experiences than children who mature physically on-time (Turkewitz & Devenny, 1993).

Elder also wants to demonstrate how the life of one person (e.g., a parent) affects the
life of another person (e.g., the child). As has been documented, the workplace and economic hardship affect parenting, which in turn affects the developmental outcomes of young children (Bradley & Corwyn, 2001; Conger et al., 1992, 1997; Elder et al., 1985; Lempers et al., 1989; McLoyd, et al., 1994). Elder also believes that a person’s perceptions of the availabilities of options and resources affects his or her decision making.

Life-course theory helps to explain how the social environment (as defined by socioeconomic status) changes parenting, which in turn affects the child’s academic achievement and self-esteem. How a person perceives the availabilities of the social resources (education and occupational prestige) and financial resources (family income) influences how choices are made. Changes in socioeconomic environment also influence the child’s emotional health (McLeod & Shannahan, 1996). Therefore, in this dissertation, the adolescents who perceive their family’s social status as low may have low self-esteem or low confidence. In addition, adolescents who perceive their families as lacking in family income may want to focus on finding a job instead of improving academic achievement. Therefore, those adolescents may not perform well at school.

By applying Elder’s life course theory, particularly the notion of the interdependence of lives, parental socioeconomic status may have an impact on their child’s life. For example, highly educated parents may be more likely to find a highly prestigious job and have higher levels of income. Parents with high and stable income may have better resources (financial and social resources) and psychological health, and a better marital relationship. Those parents are more likely to have good parenting skills and to share childrearing responsibilities. Furthermore, the adolescents whose parents are educated and have a stable income are more likely to perform better academically than are adolescents from
disadvantaged families.

**SES and Human Development**

The study of socioeconomic status (SES) in social science research has been well established. Socioeconomic status refers to a person’s or family’s social position or social standing (Graetz, 1995). It’s important to study the effects of socioeconomic status on developmental outcomes, since socioeconomic status has been associated with physical health, socioemotional functioning, and cognitive developmental outcomes in young children and adolescents (Brooks-Gunn & Duncan, 1997; Duncan & Magnuson, 2003). Parental education, income, and occupation, or the combinations of any two or three of these indicators are used frequently as indicators of socioeconomic status in social science research.

Socioeconomic status has also been linked to health, behavioral problems, and cognitive and socioemotional developmental outcomes (Bradley & Corwyn, 2002). Lower SES has been linked to several health problems, including growth retardation, birth defects, fetal alcohol syndrome, depression, and stunting during the teenage years (Brooks-Gunn & Duncan, 1997; Cassady et al., 1997; Vrijheid et al., 2000; Wasserman et al., 1998). Children who grow up in poor urban environments and neighborhoods are more likely to have more exposure to drugs, guns, knives, and acts of random violence. Crane (1991) and Loeber and Wikström (1993) also provide evidence that living in a low-SES neighborhood was related to more behavioral problems and a high percentage of out-of-wedlock births. Lower family income and lower parental education were associated with low academic achievement and low IQ in childhood (Alexander et al., 1993; DeGarmo et al., 1999; Duncan et al., 1994; Pianta et al., 1990; Zill et al., 1995). Compared to children from higher-SES families,
children from lower SES families are more likely to show psychiatric disturbances and maladaptive social functioning (Bolger et al., 1995; Brooks-Gunn & Duncan, 1997; Lahey et al., 1995; McCoy et al., 1999; McLeod & Shanahan, 1993; Moore et al., 1994).

**SES and Parenting**

Family income, parental education and occupation have been linked to parental values and behaviors. Parents who suffered financial problems were less likely to set goals for their children to be academically and psychosocially competent and less likely to emphasize self-regulation (Brody, Flor, & Gibson, 1999). Higher education is related to positive parental values that encourage self-direction (Kohn & Schooler, 1983; Luster, Rhoades, & Haas, 1989; Wright & Wright, 1976) and to more cognitively stimulating home environments (Bradley, 1985; Menaghan & Parcel, 1991). The complexity of maternal work influenced the home environment (Menaghan & Parcel, 1991).

A few longitudinal studies have found that low-SES levels lead to harsh or negative parenting, which leads to lower competence and to more maladaptive behaviors in children and adolescents (Bradley & Corwyn, 2001; Conger et al., 1992, 1997; Elder et al., 1985; Lempers et al., 1989; McLoyd et al., 1994). Lower-SES parents are more likely to suffer from low levels of energy and high levels of anxiety, hostility, and depression, have low social support levels, and experience distress from their jobs (Gallo & Matthews, 1999; McLoyd, 1990; Wilkinson, 1999). Therefore, those parents are more likely to use negative and harsh strategies to deal with parent-adolescent relationships, and provide less warmth, responsiveness, and monitoring.

**SES and Academic Achievement**

Children from families with higher socioeconomic status are more likely than their
peers from families with lower socioeconomic status to score higher on standardized achievement tests, to finish high school, and to attend college (Halle, Kurtz-Costes, & Mahoney, 1997). SES has been related to educational accomplishment (Hess & Holloway, 1984). In a study by Graetz (1995), adolescents from low-SES families did not perform academically as well as did adolescents from high-SES families. Conger, Conger, and Elder (1997) found that economic hardship negatively affected seventh grade adolescents’ school performance, particularly among male adolescents. Considine and Zappala (2002) found that parental education, but not family income, significantly predicted academic achievement. Bradley and Corwyn (2001) found that maternal education was strongly related to children’s PPVT and PIAT scores. In a study by Mercy and Steelman (1982), both the father’s and mother’s education and family income contributed to children’s intelligence test scores, with mother’s education being the strongest predictor. Parental education seemed to be an influential factor for differentiating children whose grades dropped and those whose grades were stable, in a study by Russell and Elder (1997). Some studies (Menaghan & Parcels, 1991; Parcels & Menaghan, 1990) have found that maternal occupational conditions and hourly wages, through a better home environment, affect verbal abilities.

**SES and Self-Esteem**

Few studies have investigated the relationship between SES and self-esteem in adolescence. When SES was measured by students’ possessions at home and their family’s participation in cultural activities, SES was found to be positively correlated with self-esteem in twelve-year-olds (Tremblay, Inman, & Willms, 2000). Wiltfang & Scarbecz (1990) found that fathers’ unemployment status, neighborhood unemployment status and conditions, and whether the family received welfare were more strongly related to adolescents’ self-esteem
than were paternal education and occupation. Neighborhood unemployment status refers to how people strongly agree to the statement that many men don’t have work here. Neighborhood conditions refer to whether the neighborhood is comfortable, average, below average, run down, or a slum. However, another study (Van Tassel-Baska, Olszewski-Kubilius, & Kulieke, 1994) did not find any significant effect of SES (as defined as the total family income and household size) on self-esteem (as measured by Rosenberg Self-Esteem Scale).

**Parenting and Self-Esteem**

High self-esteem is related to parental nurturance (Buri, Murphy, Richardsmeier, & Komar, 1992), parental authoritativeness (Buri, 1989), parental love and permissiveness (Buri, Murphy, Richtsmeier, & Komar, 1992; Ojha & Pramanick, 1995), family harmony (Scott, Scott, & McCabe, 1991), and positive communication between parents and adolescents (Larzelere, Klein, Schumm, & Alibrando, 1989). On the contrary, low self-esteem is related to parental rejection, restrictiveness, and punitive parental discipline (Buri et al., 1992; Ojha & Pramanick, 1995). High self-esteem was positively related to adolescents’ perceptions of maternal love (Peterson, Southworth, & Peters, 1983) and perceptions of positive parental verbal interactions (Blake & Slate, 1993), and was negatively related to perceptions of maternal punishment (Peterson, Southworth, & Peters, 1983) and perceptions of low maternal warmth (Haque, 1988).

**Academic Achievement and Self-Esteem**

Academic achievement is significantly related to self-esteem (Bachman & O'Malley, 1986; Calsyn & Kenny, 1977; Tremblay, Inman, & Willms, 2000). Several researchers (Rosenberg, Schooler, & Schoenbach, 1989) have found that general self-esteem affects
academic achievement. On the other hand, Calsyn and Kenny (1977) found evidence that self-esteem is a consequence of academic achievement. In their study on the relationships between self-esteem and academic achievement in seventh, eighth, and ninth graders, Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, and Pedro (2002) found differences in self-esteem between successful and unsuccessful academic students in seventh graders. Adolescents with lower level of academic achievement showed an increased negative attitude toward schools and less interest in school. On the same line of research, Schmidt and Padilla (2003) found that the school grades of tenth graders predicted their own self-esteem in twelfth grade in a longitudinal study. Both cross-sectional and longitudinal studies suggested that self-esteem was a consequence of academic achievement.

**Parenting and Academic Achievement**

From a bioecological perspective, school outcomes will be affected by family contexts (Bronfenbrenner, 1986; Bronfenbrenner & Morris, 1998). Academic achievement is influenced by the family socialization processes of supervision, acceptance, autonomy, conflict, responsiveness, and demandingness (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Wiest, Wong, & Kreil, 1998). High academic achievement is associated with authoritative parenting styles (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Dornbusch, Ritter, & Steinberg, 1991), positive communication, parental involvement (Patterson & Yoerger, 1991; Russell & Elder, 1997; Ryan & Powelson, 1991; Stevenson & Baker, 1987), parental support (Seginer, 1985), autonomy and motivation (Wiest, Wong, & Kreil, 1998), and parental beliefs and behavior (Halle, Kurtz-Costes, & Mahoney, 1997), and negatively related to parental negligence (Kendall-Tackett & Eckenrode, 1996) and parental indulgence (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997).
Indirect Effect of SES on Adolescents’ Self-Esteem via Academic Achievement

The hypothesized relationship is that SES has a direct effect on academic achievement, which in turn affects self-esteem. Generally, several studies had established the relationships between SES and academic achievement (Alexander et al., 1993; Bloom, 1964, Duncan et al., 1994; Escalona, 1982; Hess et al., 1982; McCall, 1981; Mercy & Steelman, 1982; Pianta et al., 1990; Walberg & Marjoribanks, 1976; Zill et al., 1995). Comparatively few studies (Bachman & O’Malley, 1986; Calsyn & Kenny, 1977; Tremblay, Inman, & Willms, 2000) have shown significant possible cause-and-effect relationships between academic achievement and self-esteem in adolescence. One longitudinal study showed the relationships among socioeconomic status, academic achievement, and self-esteem (Muijs, 1997). By studying fourth and fifth graders, Muijs (1997) found that parental socioeconomic status affected academic achievement; moreover, academic achievement was a predictor of academic self-concept.

Indirect Effect of SES on Adolescents’ Self-Esteem via Parenting

Low-SES parents are more likely to use physical discipline toward their children (Bronfenbrenner, 1986). Those practices are found to be associated with low self-confidence and self-esteem in children (Haque, 1988; Peterson, Southworth, & Peters, 1983). Haque (1988) found that young male and female undergraduates who recalled their mother as being less affectionate had negative self-esteem. A parental acceptance-rejection questionnaire was used to assess how they were treated when they were between seven and twelve years of age. Self-esteem was measured by the Rohner, Saavedra, and Granum (1978) nine-item Self-Esteem Scale, including items such as “I feel I am a good person and worthy of the respect of
others." By using multiple regression analyses, Peterson, Southworth, and Peters’ (1983) study showed that perceived maternal loving and demanding were related to fifth and sixth graders’ self-esteem.

**Indirect Effect of SES on Adolescents’ Academic Achievement via Parenting**

Lower-educated and lower-income parents are more likely to exert authority, require conformity, and provide less warmth in the family relationship, whereas higher-educated parents are more likely to encourage self-direction in their children (Kohn & Schooler, 1983; Luster, Rhoades, & Haas, 1989; Wright & Wright, 1976). Those practices are said to influence adolescents’ academic achievement (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987). Beyer (1995) proposed that maternal employment affects parenting style, which in turn affects academic achievement. DeGarmo, Forgatch, and Martinez (1999) studied the relationships among socioeconomic status, parent-child relationship, and academic achievement in six- through nine-year-old children from 238 divorced families. Based on SES path models, they found that each SES indicator (maternal education, maternal occupation, and income) was related to better parenting (maternal discipline and problem solving), which in turn influenced skill-building activities and school behavior that had affected the child’s reading and mathematics.

Social class seems to make a difference from the beginning. Children from working-class families may lag behind their peers from middle-class families when they enter the school (Tudge, Odero, Hogan, & Etz, 1996). One of the reasons may be due to different socializations. For example, middle- and working-class parents may socialize their children differently (Bronfenbrenner, 1958). Parents from different social classes have different
parental beliefs and values as well and how their values influence their beliefs (Hoff et al., 2002; Kohn, 1963, 1995). Kohn (1963) found that working-class parents emphasized conformity in their young children.

**Gender Differences in Academic Achievement**

Some researchers found gender differences in academic achievement, favoring either boys or girls in different subjects (Brooks & Mercincavage, 1991; Considine & Zappala, 2002; Fierros, 1999; Freeman, 2003; Han, 1993; Ross & Broh, 2000; Savin-Williams & Demo, 1984; Tremblay, Inman, & Willms, 2000). Are there real gender differences in academic achievement? Steinberg (2000) claims that there are no cognitive differences between females and males, but there are differences in academic achievement between males and females. Fierros (1999) reported few significant gender differences favoring males in mathematics achievement in eighth grade. Males were better at mathematics literacy (i.e., application of mathematics to everyday problems and in advanced mathematics).

On the other hand, other researchers have reported gender differences favoring female students (Brooks & Mercincavage, 1991; Freeman, 2003; Han, 1993; Lindgram et al., 1986; Schram, 1996). For example, high school female students with advanced mathematics background had higher scores than matched male students (Han, 1993). British gifted girls achieved better academically than did British gifted boys (Freeman, 2003). Female college students also have been found to outperform their male counterparts (Brooks & Mercincavage, 1991; Lindgram et al., 1986). Schram (1996) also found that female undergraduates outperformed their male peers in terms of total course performance.

Males and female are good at different areas of academic achievement, e.g., spelling or mathematics. In general, some researchers have found that males outperform females in
mathematics (Han & Hoover, 1994) and in science (Lupart, Cannon, & Telfer, 2004), while females outperform males in spelling (Allred, 1990) and in reading (Tremblay, Inman, & Willms, 2000). Male students (eighth to twelfth grade) did better than female students on multiple-choice questions (Bolger & Kellaghan, 1990; Fierros, 1999).

Some researchers (Klein, 2004) have believed that there is no significant gender difference in academic achievement until high school. The gender gap was not significant during the elementary school years, but it increased during the junior and high school years.

Gender differences in academic achievement can be attributed to gender stereotypes, norms, and expectation (Extrom, 1994; Grossman & Grossman, 1994), parental socialization (Steinberg, 2000), cultural stereotypes and perceptions (Klein, 2004), or traditional feminine values (Smith, 1992). For example, some female adolescents may think that performing well in mathematics and science is not as attractive as being good at reading poetry. At home, parents may attribute good mathematics performance to hard work for daughters, but to intelligence for sons. Therefore, parents also may encourage their sons to take more advanced mathematics courses, while they might not encourage their daughters who did as well to the same degree. In school, teachers who strongly believe in males’ advantage in mathematics may ask male students more questions. Such attribution and parenting styles may influence actual academic achievement.

**Gender Effects in Self-Esteem**

Many studies have shown that female adolescents tend to have lower levels of self-esteem than do male adolescents (Cairns, McWhirter, Duffy, & Barry, 1990; Chubb, Fertman, & Ross, 1997; Harter, 1998; Raymore, Godbey, & Crawford, 1994; Richards, Gitelson, Petersen, & Hurtig, 1991; Richman, Clark, & Brown, 1985; Roberts et al., 2000;

**Gender Effects in the Relationships among SES, Parenting, Academic Achievement, and Self-Esteem**

Little is known about gender differences in the relationships among socioeconomic status, parent-adolescent relations, adolescent’s academic achievement, and self-esteem. In this dissertation, possible gender effects will be examined. Furthermore, the hypothesized model will utilize Bronfenbrenner’s biocological systems model to study how microsystem (parent-adolescent interactions), exosystem (parental occupation and education), and macrosystem (gender) would affect adolescents’ academic achievement and self-esteem.

**The Contribution of this Study**

A considerable amount of research studied the effects of a family’s SES on the development of infants and young children (Gottfried, Gottfried, Bathurst, Guerin, & Parramore, 2003), but significantly less research has been done on the effects of SES on the development of adolescents (Bornstein, Hahn, Suwalsky, & Haynes, 2003; Garrett, Ng’andu, & Ferron, 1994; Gazeboom & Treiman, 1996).

The majority of research studies on socioeconomic status and on the relationships between academic achievement and self-esteem is cross-sectional and correlational in nature, and therefore provide only evidence that predictors and outcome variables were correlated with each other. They do not provide evidence for a possible causal relationship between predictors and outcome variables. To do so, longitudinal studies are needed (Lamborn, Mounts, Steinberg, & Dornbusch, 1991). The present study is a three-year longitudinal study.
In general, father’s education, occupation, and total family income are used as a composite measurement of socioeconomic status in most studies. In the past, fathers were usually the major breadwinner who had a job and brought the paycheck home. However, the number of working mothers has increased significantly in recent years. The effects of the workplace, skills, and education of mothers should not and cannot be ignored. Therefore, the proxy measures of socioeconomic status for this study are family income as measured by averaging father’s and mother’s report of family income, parental education, and occupational prestige. In addition, this study will use both parental and adolescents’ reports on parenting, academic achievement, and self-esteem. The variables of interest include maternal and paternal education, family income, maternal and paternal occupational prestige, maternal and paternal perceptions of his/her own parenting, adolescents’ perceptions of maternal and paternal parenting, maternal and paternal perceptions of adolescents’ academic achievement, adolescents’ perception of their own academic achievement, maternal and paternal perceptions of adolescents’ self-esteem, and adolescents’ perceptions of their own perception of self-esteem.

Little is known about how the three components of socioeconomic status (education, occupation, and income) interact synergistically with each other to affect parenting and the developmental outcomes of adolescents (Bradley & Corwyn, 2002). Some researchers have used a composite measurement of SES or a single SES indicator (e.g., father’s education, occupation, and income). Some have assessed SES by using a composite measurement. Several researchers have also argued for different effects of parental education and family income by investigating the unique contribution of each indicator of SES (e.g., income, parental education, and occupation) on a child’s developmental outcome (Bornstein, Hahn,
Suwalsky, & Haynes, 2003; Garrett, Ng’andu, & Ferron, 1994; Gazeboom & Treiman, 1996). In this study, the unique contribution of each SES indicator to parenting, adolescents’ academic achievement, and their self-esteem will be investigated.

This study will use structural equation modeling to investigate a model of how SES might affect parenting, adolescents’ academic achievement and self-esteem, and their interrelations.

Therefore, the features of this dissertation include: 1) trying to establish a possible cause-and-effect relationship among SES, parenting, academic achievement, and self-esteem in early- and middle- adolescence by using a longitudinal study conducted by Lempers and others (1997); 2) multiple persons’ reports, e.g., the academic achievement as measured by the father, the mother, and the adolescent child; 3) examining the possible differential effects of each SES indicator (family income, paternal and maternal levels of education, and paternal and maternal levels of occupational prestige); and 4) analyzing the data by using up-to-date statistical analysis, such as Structural Equation Model data.
CHAPTER 2. LITERATURE REVIEW

A large body of literature provides the background for the present studies on the relationship between the following: socioeconomic status (SES) and parenting, SES and academic achievement, parenting and academic achievement, parenting and self-esteem, and academic achievement and self-esteem. This chapter will review that literature.

The study of socioeconomic status in social science research has been well established. Parental education, income, and occupation, or the combinations of any two or all three of these indicators, are used frequently as indicators of socioeconomic status in social science research. Highly-educated parents are more likely to have high incomes (Santelli & Beilensen, 1992). Most of the researchers agree that a composite measure of socioeconomic status is a better form of measurement than a single indicator for assessing socioeconomic status. There is, however, a debate on how to combine and measure the components for assessing socioeconomic status, and which statistical analyses are better for studying the effect of a single indicator or a composite measurement of SES on child developmental outcomes.

Bradley and Corwyn (2002) have reviewed a large number of studies on the effects of SES on children’s development, particularly over health, cognitive and academic attainment, and socioemotional development. Regarding the relationship between SES and health, they found that low-SES children and adolescents are more likely to have several health problems. These health problems include growth retardation, birth defects, fetal alcohol syndrome, depression, obesity, and stunting during the teenage years (Brooks-Gunn & Duncan, 1997; Cassady et al, 1997; Crook, 1995; DiPietro et. al., 1999; Hawley & Disney, 1992; Kramer,
Regarding the relationship between SES and cognitive and academic attainment, low family income and low parental education were associated with low academic achievement and low IQ in childhood (Alexander et al., 1993; Bloom, 1964; DeGarmo et al., 1999; Duncan et al., 1994; Escalona, 1982; Hess et al., 1982; Mercy & Steelman, 1982; Pianta et al., 1990; Scarr & Weinberg, 1978; Walberg & Marjoribanks, 1976; Zill et al., 1995). The differences between low-SES children and high-SES children in language proficiency and performance are substantial (Hart & Risley, 1995; Hoff-Ginsberg, 1991). Regarding the relationship between SES and socioemotional development, low-SES children are more likely than high-SES children to show psychiatric disturbances and maladaptive social functioning (Bolger et al., 1995; Brooks-Gunn & Duncan, 1997; Lahey et al., 1995; McCoy et al., 1999; McLeod & Shanahan, 1993; Moore, et al., 1994; Patterson et al., 1989; Sameroff et al., 1987; Starfield, 1989; Takeuchi et al., 1991). Adolescents from low-SES families are also more likely to be depressed and delinquent (McLoyd, 1997).

While the research literature clearly substantiates the effects of SES on child development, much work needs to be done on examining the many mechanisms, such as environmental resources or constraints, family characteristics (such as the level of family conflict or parent-child interaction styles), and individual characteristics (such as resilience or coping styles), have been suggested by researchers to link SES and child well-being. Furthermore, little is known about how the three components of socioeconomic status (education, occupation, and income) interact synergistically with each other to affect parenting and developmental outcomes of adolescents (Bradley & Corwyn, 2002).

Bradley and Corwyn (2002) have argued that SES affects developmental outcomes.
For example, low-SES parents are less likely to regulate their child’s TV viewing (Bradley, Corwyn, Burchinal, Pipes, McAdoo, & Garcia Coll, 2001). They point out that researchers, in addition to investigating individual-level SES, should look at community-level SES because neighborhood of residence is related to health, achievement, and behavioral outcomes when the effects of individual-level SES are controlled. Children who grow up in poor urban environments and neighborhoods are more likely to have easy access to drugs, guns, and knives, and to be exposed to acts of random violence. Garbarino (1999) has suggested that such exposure may interfere with the child’s ability to think clearly and to solve problems (Osofsky, 1999). Crane (1991) and Loeber and Wikström (1993) also provide evidence that living in a low-SES neighborhood is related to behavior problems and getting pregnant without marriage. Earls et al. (1994) found that parents who live in dangerous neighborhoods are more likely to use harsh control discipline and aggressive language toward their own child. Parents may use more parental control and increase harsh language to protect their young children in dangerous neighborhoods.

Several researchers (Gallo & Matthews, 1999; McLoyd, 1990; Wilkinson, 1999) have found that low-SES parents are more likely to use negative and harsh strategies to deal with their children, to provide less warmth, responsiveness, and monitoring because of low levels of energy, to suffer from high levels of anxiety, hostility, and depression, to have low social support levels, and to experience distress from jobs. A few longitudinal studies have found that low SES levels lead to harsh or negative parenting, which leads to lower competence and to more maladaptive behaviors in children and adolescents (Bradley & Corwyn, 2001; Conger et al., 1992, 1997; Elder et al., 1985; Felner et al., 1995; Luster et al., 1995; Lempers et al., 1989; McCoy et al., 1999; McLoyd et al., 1994; Morrison & Eccles, 1995). In a study
of African American children aged six to nine, Brody, Flor and Gibson (1999) found that parents in economically distressed families are less likely to set goals for their children to be academically and psychosocially competent and less likely to emphasize self-regulation.

Several studies have investigated variables that act as either moderators or mediators in the link between SES and child well-being. Moderator variables are variables that interact with SES in its effect on well-being, whereas mediator variables are linking variables such that SES impacts the mediator variable and the mediator variable impacts the outcome variable (Baron & Kenny, 1986). Garmezy (1993) proposed three categories of variables that may function as moderators in the relationships between SES and child well-being: First, personality factors, such as self-esteem, locus of control, self-efficacy, and cognitive competence; second, family characteristics, such as cohesion, conflict, and consistency of rules, and third, availability of external support systems. Different people with different personalities, with different family relationships, and/or with different levels of peer support, may react to the same stressful situation in very different ways. Leventhal and Brooks-Gunn (2000) proposed three potential mediators in the relationship between SES and child well-being: Their first category of mediator variable are institutional resources such as the availabilities of schools, child care centers, hospitals, and employment opportunities. For example, Entwisle and others (1994) found that the mathematics reasoning of school-age boys was related to the neighborhoods they lived in. They suggested that this might be because different neighborhoods provide different opportunities of playing games with complex rules with peers. The second category of mediator variable Leventhal and Brooks-Gunn (2000) propose is relationships, that is, the characteristics of parents and of support networks available to parents. Their third type of mediator is norms, e.g., expectations of and
social control of behavior of children by teachers. For example, socializing with deviant peers may mediate the relationship between neighborhood SES and adolescent mental health and achievement (Darling & Steinberg, 1997; Elliott et al., 1996; Sampson et al., 1997). It is possible that a particular variable can act both as a moderator and a mediator.

In this study, parenting will be investigated as a possible mediator in the relationship between SES and adolescents’ self-esteem and between SES and adolescents’ academic achievement. First, studies on the relationship between SES and self-esteem will be reviewed. Second, research on the relationships among SES, parenting, and adolescents’ self-esteem will be presented. Third, empirical data on the relationships among SES, adolescents’ academic achievement, and self-esteem will be presented. Fourth, data on the relationships among SES, parenting, and adolescents’ academic achievement will be discussed. And fifth, the possible effects of gender on these relationships will be reviewed.

**SES and Self-Esteem**

The literature supporting the evidence that socioeconomic status is related to adolescents’ self-esteem will be reviewed in this section. Most of the research has found a significant relationship between socioeconomic status and self-esteem (Ross & Broh, 2000; Tremblay, Inman, & Willms, 2000; Wiltfang & Scarbecz, 1990). However, in their study of fifty-one high school students, Blackmon and Durm (1997) did not find a significant correlation between parents’ education and their children’s report of their self-esteem. In another study of 200 parents and their ten- to twelve-year-old children, parental education had little influence on the child’s self-esteem (Bouissou & Tap, 1998). Parental unemployment has been found to have aversive effects on the children’s self-esteem (Christoffersen, 1994).
Children from families with higher levels of income tend to have higher self-esteem (Ross & Broh, 2000). Tremblay, Inman, and Willms (2000) examined the relationship among SES, physical activity, self-esteem, and reading and mathematics scores for twelve-year-olds. They determined socioeconomic status by measuring students' possessions at home and their family's participation in cultural activities (e.g., going to the museum, concerts, and library). They found that SES was positively correlated to self-esteem. That is, children who had more possessions at home and were more involved in cultural activities were more likely to have higher self-esteem than children who had less possession and were less involved in cultural activities. Replicating and extending Rosenberg and Pearlin's (1978) research on social class and self-esteem, Wiltfang and Scarbecz (1990) studied the relationship between socioeconomic status and self-esteem in 4,077 adolescents between the ages twelve and nineteen years. They assessed socioeconomic status by using traditional (paternal education and occupation) and non-traditional measurements (welfare, neighborhood unemployment, neighborhood conditions, and fathers' unemployment status). Adolescents' global self-esteem was measured by Rosenberg (1965) Self-Esteem Scale and the Coopersmith (1967) Self-Esteem Inventory. Their findings showed that adolescents' self-esteem was more related to the nontraditional measurements of socioeconomic status than to the traditional measurements. That is, fathers' unemployment status, neighborhood unemployment status, and whether the family received welfare were more strongly related to adolescents' self-esteem than were paternal education and occupation. Their four nontraditional measurements of social class (paternal unemployment, whether the family receives welfare, and neighborhood conditions and unemployment) explained 5% of the variance in adolescents' global self-esteem; on the other hand, the traditional measures of social class (paternal
education and occupation) explained only 1% of the variance in adolescents' global self-esteem. Paternal occupation was not related to adolescents' global self-esteem. In addition, adolescents' academic achievement was more strongly related to their self-esteem than were paternal education and occupation.

In Wiltfang & Scarbecz’s 1990 study, non-traditional measures of socioeconomic status seem to be better predictors of self-esteem, compared to the traditional measures of socioeconomic status. In this study, the effects of family income, paternal and maternal education, and paternal and maternal occupational prestige on self-esteem will be examined.

**SES, Parenting, and Adolescent Self-Esteem**

The literature supporting the relationships among SES, parenting, and self-esteem will be presented by reviewing studies that correlated SES and parenting, SES and self-esteem, parenting and self-esteem, and parenting as a potential mediator in the relationship between SES and self-esteem.

**SES and parenting**

Parental education is one of three common indicators of socioeconomic status. Parental education may change parenting styles, behaviors, and beliefs. Less-educated parents have been found to be more likely than higher-educated parents to use coercive strategies (Miranda, 1985). Compared to higher-educated parents, less-educated parents may not have the resources and efficient strategies to improve their children’s academic problems. A few researchers have found that higher education is related to positive parental values encouraging self-direction (Kohn & Schooler, 1983; Luster, Rhoades, & Haas, 1989; Wright & Wright, 1976) and to more cognitively stimulating home environments (Bradley, 1985; Menaghan & Parcel, 1991). On the other hand, Veneziano and Rohner (1998) did not find
that the youths’ perceptions of paternal acceptance and paternal involvement were related to social class (as measured by current employment and occupational status). Studies have linked parental occupation to parental values and behaviors. Menaghan and Parcel (1991), in their study of 795 employed mothers and their child aged three through six years old, found that the complexity of maternal work influenced the home environment. Home environments were measured by the Home Observation for Measurement of the Environment (HOME) scales (Bradley & Caldwell, 1984), which measured cognitive variables, social variables, and physical environmental variables. Parents whose jobs required problem solving skills and complex cognitive activities provided more affective parenting and a more cognitively enriching environment than parents whose jobs required less complex cognitive activities. Not only do parents apply their problem solving skills to their jobs, but also to their parenting.

In a study of 184 mothers and their four-year-olds, maternal education and occupation were associated with maternal control, defined as maternal tendency to support the child’s autonomy, which is found to be the important ingredient to foster desirable developmental outcomes (Sullivan & McGrath, 1999). Based on previous studies, higher levels of education, occupation, and income are correlated with the optimal parenting styles.

**Parenting and self-esteem**

One of the purposes of this study is to investigate the relationship between parenting and the self-esteem of adolescents. During childhood, the quality of the parent-child relationship is more important than the peer relationship regarding the development of self-esteem. During adolescence, self-esteem still depends on the quality of the parent-child interaction and on parenting variables such as warmth, acceptance/rejection, and
autonomy/control (Ryan, Stiller, & Lynch, 1994). Several research studies have examined the relationship of parenting to the self-esteem of adolescents (Buri, Murphy, Richtsmeier, & Komar, 1992; Capaldi, Forgaph, & Crosby, 1994; Larzelere, Klein, Schumm, & Alibrando, 1989; Linver & Silerberg, 1995; Roberts & Bengtson, 1993; Scott, Scott, & McCabe, 1991). Studies have shown that parental variables, such as acceptance, rejection, warmth, autonomy, and closeness, are significantly correlated with self-esteem of children (Burnett & Demnar, 1996; Juhasz, 1989; Margolin et al., 1988; Openshaw et al., 1983, 1984; Paulson et al., 1991; Walker & Greene, 1986).

Studies (Buri et al., 1992; Ojha & Pramanick, 1995; Peterson et al., 1983) have shown that parental love and permissiveness are related to high self-esteem, while parental rejection, restrictiveness, and punitive parental discipline are associated with low self-esteem. Adolescents’ self-esteem is undermined when they feel rejected by their parents; they view themselves as not worthy of love and support. Buri (1989) found that both the mothers’ and the fathers’ nurturance as perceived by the adolescents were positively related to adolescent self-esteem, and that parental authoritativeness was positively related to self-esteem, whereas parental authoritarianism was inversely related to self-esteem. Buri, Murphy, Richtsmeier, and Komar (1992) investigated the relationship between parental nurturance and self-esteem in 784 adolescents and young adults. They found that parental nurturance was more strongly related to self-esteem during junior high school than during high school and college. Parental nurturance was still a robust predictor of self-esteem for high school adolescents and young adults.

Capaldi, Forgaph, and Crosby (1994) investigated the importance of the affective tie between parents and children for adolescents’ self-esteem over a two-year time period by
assessing the relationship of affects with self-esteem in 200 boys (aged thirteen through twenty-six) and their parents. They found that parents’ positive affects were related to adolescent self-esteem and to the quality of the parent-adolescent relationship. Positive communication between parents and children is a powerful predictor of self-esteem (Larzelere, Klein, Schumm, & Alibrando, 1989).

Scott, Scott, and McCabe (1991) found children's self-esteem to be associated with family harmony and parental nurturance. Linver and Silerberg (1995) established that parents providing respect and autonomy had adolescent children with higher self-esteem, fewer psychological symptoms, and greater self-reliance. Walker and Greene (1986) found that the quality of parent-child relationships contributed significantly to self-esteem for thirty-eight males and fifty-three females aged eleven to twenty-eight years, followed by peer relationships. Ojha and Pramanick's study (1995) with 340 adolescents aged sixteen to eighteen showed that nurturing behaviors of both parents contribute significantly and positively to self-esteem, while their rejecting behaviors contribute significantly and negatively to self-esteem. McCormick and Kennedy (1994) investigated the relationship between the parent-child relationship and self-esteem in adolescence, and found that self-esteem was related to attachment and to the dimensions of independence, encouragement, and acceptance. The research clearly indicates that the relationship with parents is a significant predictor of self-esteem from childhood to adulthood.

Other studies have examined the effects of children’s perception of parenting on their self-esteem (Blake & Slate, 1993; Buri, 1989; Demo, Small, & Savin-Williams, 1987; Haque, 1988; Paulson, Hill, & Holmbeck, 1991; Peterson, Southworth, & Peters, 1983). Peterson, Southworth, and Peters (1983) investigated the relationships between children’s
perceptions of maternal child-rearing behaviors and children’s self-esteem within low-income families. Multiple regression analyses showed that perceptions of maternal love and demands were positively related to self-esteem, whereas perceptions of maternal punishment were negatively correlated with fifth and sixth graders’ self-esteem. Demo, Small, and Savin-Williams (1987) found that various dimensions of parent-adolescent interactions predicted self-esteem of 139 adolescents and young adults aged ten to twenty-seven. They also found that parents and adolescents have independent but overlapping perceptions of their relationships. Most correlations between paternal, maternal, and adolescents’ reports of parent-adolescent relationship were significant, but the strength of the reported coefficients did not exceed 0.55. Male adolescents’ self-esteem was influenced by the parent-adolescent interaction more than was female adolescents’ self-esteem. Haque (1988) found that young adults’ perceptions of low maternal warmth were positively correlated with their own assessment of low self-esteem.

Paulson, Hill, and Holmbeck (1991), in their study of 200 parent-child dyads, reported that self-esteem of seventh graders was influenced by their perceptions of parental warmth. In addition, no differences in parental warmth were found between fathers and mothers, but the children perceived their mothers to be closer to them than their fathers, and the mothers also perceived more closeness with their children than did their fathers. Blake and Slate (1993) found that perceived positive parental verbal interactions were strongly related to the level of self-esteem in sixty-four high school students. Those who perceived high levels of positive parental verbal interactions tended to be confident and to like themselves, whereas those who perceived low levels of positive parental verbal interactions tended to have low levels of self-esteem.
SES, parenting, and self-esteem

A considerable number of research studies have established strong positive relationships between SES and parenting, and between parenting and self-esteem. In general, a variety of parenting variables seem to be robust predictors of adolescents’ self-esteem. However, few studies (Bolger et al., 1995; Elder, Nguyen, & Caspi, 1985; Lempers, Clark-Lempers, & Simons, 1989; McLoyd, 1990; Ruiz, Roosa, & Gonzales, 2002) have examined parenting as a mediator variable between SES and children’s well-being. Bolger, Patterson, Thompson, and Kupersmidt’s (1995) study of African American children ages six to nine found that maternal involvement mediated 31% of the variance in self-esteem. Lempers, Clark-Lempers, and Simons’ (1989) study of secondary school students found that economic hardship in lower- and middle-class families had direct and indirect effects on adolescent distress and an indirect effect on adolescents’ drug use via inconsistent parental discipline as a mediating variable. In a recent study of 188 sixth and 210 eighth graders along with their mothers and fathers, Lempers and Clark-Lempers (1997) found that the parent-child relationship mediated the association between mothers’ financial strain (resulted from economic hardship) and adolescents’ distress. Economic hardship led to financial strain, which led to adolescents’ distress via the mother-child relationship and the mothers’ level of marital happiness. In Ho, Lempers, and Clark-Lempers’ (1995) study of sixth and eighth graders, the parent-adolescent relationship mediated the association between economic hardship and adolescents’ self-esteem. Adolescents from families suffering from economic hardship were more likely to have lower self-esteem via lower levels of affective parental support. Elder, Nguyen, and Caspi (1985) studied how the impact of income change on children’s psychosocial well-being was mediated by parenting. During the economic
hardship of the Great Depression, the psychosocial well-being of unattractive daughters was more likely to be influenced by the father’s rejecting behavior. They indicated that the child’s unattractiveness and paternal rejection behavior increased the aversive impact of economic hardship on the child’s psychosocial well-being.

In her study of African-American children and adolescents, McLoyd (1990) also indicated that poor parents were more likely to use negative parenting and to provide less warmth, which led in turn to socioemotional problems such as low self-esteem. In a recent cross-cultural study of 161 European- and 70 Mexican-American youths, Ruiz, Roosa, and Gonzales (2002) found significant main effects of and interaction effects between SES, ethnicity, and parenting practices (acceptance, rejection, inconsistent discipline, and hostile control). Specifically, middle-class European parents had more influence on their children’s self-esteem than did low-income Mexican-American parents.

One purpose of the present study will be to investigate if and to what extent SES influences adolescent self-esteem both directly and indirectly, through parenting.

**SES, Academic Achievement, and Self-Esteem**

The literature supporting the relationship between socioeconomic status (SES) and academic achievement, and between academic achievement and self-esteem, will be reviewed and discussed next.

**SES and academic achievement**

Several studies have investigated the relationship between SES and intelligence and between SES and academic achievement (Alexander et al., 1993; Bloom, 1964; Conger, Conger, & Elder, 1997; Duncan et al., 1994; Escalona, 1982; Hess et al., 1982; McCall, 1981; Mercy & Steelman, 1982; Pianta et al., 1990; Walberg & Marjoribanks, 1976; Zill et
al., 1995). The findings of these studies document that lower parental education and lower income are associated with lower school achievement and lower IQ in childhood. Children from families with higher socioeconomic status are more likely to score higher on standardized achievement tests, finish high school, and attend college than their peers from families with lower socioeconomic status (Halle, Kurtz-Costes, & Mahoney, 1997).

Bornstein, Hahn, Suwalsky, and Haynes (2003) argued that the different components of SES (income, education, and occupation) may have differential effects on child outcomes. Their study of 324 European-American mother-infant dyads found that maternal education was a significant predictor for both maternal and infant behaviors. Infants from families of higher SES as measured by Hollingshead’s four-factor index (1957) engaged in more social exchange and showed lower levels of gross motor development. Infants whose mothers worked more hours were more likely to exhibit lower levels of physical development. Highly-educated mothers were more likely to provide their infants with more stimulating objects for exploration, encourage physical development more, and interact with their infants more. Bradley and Corwyn (2001) found that maternal education was strongly related to children’s PPVT and PIAT scores. Mercy and Steelman’s (1982) study of 2,994 children aged six through eleven found that mother’s education, father’s education, and the family’s income contributed to children’s intelligence test scores, with mother’s education being the strongest predictor.

Parental education seems to be an influential factor for differentiating children whose grades dropped and those whose grades were stable (Russell & Elder, 1997). Children whose parents had higher levels of education were more likely than children whose parents had lower levels of education to maintain their scores. Parental education may have both direct
and indirect influences on academic achievement, because more educated parents are more likely to engage themselves in intellectual/cognitive forms of parental involvement (Grolnick & Slowiaczek, 1994). Intellectual/cognitive parental involvement includes such things as taking the children to museums and libraries, planning trips to the zoo, reading to the children, and having the children read more intellectually-stimulating books. The amount of intellectual activities and interests at home has been associated with children’s academic achievement (Keeves, 1972). In terms of the effect of maternal occupation on achievement, Gottfried, Gottfried, Bathurst, Guerin, and Parramore (2003) did not find significant correlations between mothers’ occupational status and achievement. However, maternal occupational conditions and hourly wages predicted better home environment (Menaghan & Parcels, 1991), which in turn predicted three to six year-olds’ verbal abilities (Parcels & Menaghan, 1990). The importance of maternal occupational conditions should not be ignored.

Adolescents from low-SES families did not perform well academically compared to adolescents from high-SES families (Graetz, 1995). Conger, Conger, and Elder (1997) examined the relationships among family economic hardship, parents’ responses to the pressure of hardships, their children’s school performance, and their internalizing and externalizing problems in 357 seventh graders. Their findings showed that economic hardship negatively affected adolescents’ school performance. Male adolescents particularly were more influenced by parental financial conflict. Considine and Zappala (2002) examined the impact of socioeconomic, family, individual, and contextual factors on educational performance in 2,000 students from social and economically disadvantaged families. Parental education was a significant predictor of academic achievement, but family income did not
significantly predict school performance when other factors were controlled. Considine and Zappala (2002) argued that the social (e.g., parental education) and the economic components (e.g., family income) of SES have different and distinct influences on school achievement. For these reasons, the potentially differential effects of education, income, and occupation should be assessed.

**Academic achievement and self-esteem**

Several studies (Bachman & O'Malley, 1986; Bean, Bush, McKenry, & Wilson, 2003; Calsyn & Kenny, 1977; Lockett & Harrell, 2003; Tremblay, Inman, & Willms, 2000) have reported significant relationships between academic achievement and self-esteem. However, Leondari and Gialamas (2000) did not find significant relationships between academic achievement and self-esteem in their study of 415 high school students. In their study of European American and African American adolescents, Bean, Bush, McKenry, and Wilson (2003) found significant relationships between maternal support and academic achievement and self-esteem. Using hierarchical linear regression to analyze their data, Lockett and Harrell (2003) found that individual differences in adolescents’ self-esteem predicted over 50% of racial identity’s effect on academic achievement. Self-esteem also seems to have a protective function for psychological health. Alves-Martins, Peixoto, Gouveia-Pereira, Amaral and Pedro (2002) noted that low-achievement adolescents protected their self-esteem by attaching less importance to school-related subjects and showing more negative attitude toward schools.

It is still a lively debate on whether self-esteem is a cause or a consequence of academic achievement. Several researchers (Rosenberg, Schooler, & Schoenbach, 1989) have found that general self-esteem affects academic achievement. Bowles (1999) developed
a mode of linking time orientation, self-esteem, and academic achievement with self-esteem as a mediator between time orientation and academic achievement. Stewart, Bond, Abdullah, and Ma (2000) found that for female, but not male, adolescents self-esteem mediated the relationships between parental warmth and academic achievement.

On the other hand, Calsyn and Kenny (1977) found evidence that self-esteem is a consequence of academic achievement. By examining the effects of academic achievement on eighth graders’ self-esteem, Ross and Broh (2000) found that adolescents’ academic achievement and parental support at eighth grade increased their self-esteem at tenth grade. Self-esteem did not predict subsequent academic achievement or test scores.

The question whether self-esteem is a cause or an effect of academic achievement leads to another question with educational application. Based on two models of education—self-enhancement and skill development—the type of intervention one would consider is different. The first focuses on improving a child’s self-concept of ability, and the second on improving a child’s educational performance by devoting more time to the curriculum. In a longitudinal study of 556 adolescents, Calsyn and Kenny (1977) found that their data lent more support to the skill development model. That is, a strong self-concept of ability is more likely to be a consequence of academic achievement, rather than a cause of academic achievement. Doing well at school improves self-esteem; however, improving self-esteem does not improve test scores.

Most studies on the relationship between academic achievement and self-esteem are correlational studies, and thus cannot establish a potential causal relationship between academic achievement and self-esteem. The purpose of this study is to try to establish a possible causal relationship between academic achievement and self-esteem by using data
from a three-year longitudinal study.

**SES, academic achievement, and self-esteem**

Several studies have shown that young students from families of lower SES have lower academic achievement and cognitive attainments than their counterparts of higher SES (Alexander, Entwisle, & Dauber, 1993; Bloom, 1964; Duncan, Brooks-Gunn, & Klebanov, 1994; Escalona, 1982; Hess, Holloway, Price, & Dickson, 1982; McCall, 1981; Mercy & Steelman, 1982; Pianta, Egeland, & Sroufe, 1990; Walberg & Marjoribanks, 1976; Zill et al., 1995). Other studies (Bachman & O’Malley, 1986; Calsyn & Kenny, 1977; Tremblay, Inman, & Willms, 2000) have reported significant relationships between academic achievement and self-esteem. However, few studies (Muijs, 1997) have investigated the mediating effects of academic achievement in the relationship between SES and self-esteem. In a longitudinal study of 1,001 fourth and fifth graders (mean age 9.5 and 10.5 years, respectively) in Belgian, Muijs (1997) found that global self-esteem was not a significant predictor of academic achievement; however, academic achievement was a predictor of academic self-concept. In addition, parental SES significantly affected academic achievement in young children.

According to Bem’s (1965, 1967) Self-Perception theory, children’s self-esteem builds on their positive academic achievement. It is postulated that the relationship between children’s academic achievement and the child’s self-esteem is stronger than the relationship between parental achievement and the child’s self-esteem. However, Savin-Williams and Demo’s (1983) study of 118 fifth and sixth graders, in which social class, academic skills, and self-esteem were assessed by father’s occupational status, the Iowa Test of Basic Academic skills, and the Coopersmith Self-Esteem Inventory (1967), respectively, found no
significant relationships between social class and self-esteem nor between academic achievement and self-esteem.

Most studies on the relationships between SES and academic achievement and between academic achievement and self-esteem are correlational and cross-sectional in nature. In this study, the possible mediating effect of academic achievement in the relationship between SES and self-esteem will be examined. SES is hypothesized to have a positive effect on adolescents' academic achievement, and better achievement, in turn, is assumed to increase adolescents' self-esteem.

**SES, Parenting, and Academic Achievement**

One of the purposes of this study is to investigate the possible mediating effect of parenting in the relationship between SES and academic achievement. The literature supporting the relations between SES and parenting and between parenting and academic achievement will be presented. Quite a few studies have shown that SES influences parenting, which, in turn, influences academic achievement. Low-educated and low-income parents are more likely to exert authority, require conformity, and provide less warmth in the family relationship. Those practices are said to influence their young children's or adolescents' academic achievement.

**Parenting and academic achievement**

A large body of research has supported that parenting has an impact on academic achievement (Fan & Chen, 2001). From an ecological perspective, school outcomes will be affected by family contexts (Bronfenbrenner, 1986; Bronfenbrenner & Morris, 1998). Academic achievement is influenced by the family socialization processes of supervision, acceptance, autonomy granting, conflict, responsiveness, and demandingness. Authoritative
parenting styles (Dornbusch et al., 1991), positive communication, parental involvement (Patterson & Yoerger, 1991; Russell & Elder, 1997; Ryan & Powelson, 1991; Stevenson & Baker, 1987), parental support (Seginer, 1985), autonomy and motivation (Wiest, Wong, & Kreil, 1998), realistic expectations from parents for sons (Seginer, 1985), and parental beliefs and behavior (Halle, Kurtz-Costes, & Mahoney, 1997) all have been positively associated with high academic achievement as measured by grade point average (GPA) or by performance on standardized tests for mathematics and English.

**Parenting styles**

Baumrind (1991) associated three major parenting styles with child developmental outcomes: authoritative, authoritarian, and permissive. Maccoby and Martin (1983) differentiated two types of permissive parenting: indulgent and neglectful. Authoritative parenting is defined by high levels of responsiveness, defined by Baumrind (1991) as “the extent to which parents intentionally foster individuality, self-regulation, and self-assertion by being attuned, supportive, and acquiescent to children’s special needs and demands” (p. 62) and high levels of demandingness, defined by Baumrind (1991) as “the claims parents make on children to become integrated into the family whole, by their maturity demands, supervision, disciplinary efforts and willingness to confront the child who disobeys” (p. 61); authoritarian parenting is defined by low levels of responsiveness and high levels of demandingness, indulgent parenting is defined by high levels of responsiveness and low levels of demandingness, and neglectful parenting is defined by low levels of responsiveness and low levels of demandingness. Authoritative parenting has been found to correlate positively with educational achievement and healthy psychological development. Children from authoritative families get better achievement scores than do children from indulgent and
neglectful families. Dornbusch, Ritter, Leiderman, Roberts, and Fraleigh (1987) found that authoritative parenting styles were positively correlated with adolescents’ grades, whether they are from two-parent nuclear families, mother-custody families, or stepfather families. Neglect has a significantly detrimental impact on children’s abilities to perform at school (Kendall-Tackett & Eckenrode, 1996). Adolescents who perceived their parents as indulgent or neglectful had lower achievement scores than did adolescents who perceived their parents as authoritative (Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997). Glasgow, Dornbusch, Troyer, Steinberg, and Ritter (1997) also found that adolescents from non-authoritative homes are more likely to attribute success to external causes (such as luck) and failure to internal causes (such as ability). Parenting styles may influence adolescents’ attribution styles, which, in turn, might influence academic achievement.

Parental involvement

Parental involvement has been conceptualized in three ways: behavioral, personal, and cognitive/intellectual (Grolnick & Slowiaczek, 1994). Going to school and participating in school activities are categorized as parental behavioral involvement. Expressing interest in attending school events (e.g., PTA meeting) and asking the teachers questions about how the child does at school are examples of parental personal involvement. Going to the museum and the library and exposing children to stimulating books and magazines are examples of cognitive/intellectual involvement. Studies have shown that the number of books at home and the amount of intellectual activities and interests at home are significantly correlated with children’s academic achievement (Halle, Kurtz-Costes, & Mahoney, 1997; Keeves, 1972; Kurdek & Sinclair, 1988).

Results of studies on the effects of parental involvement on developmental outcomes
in early and middle childhood and adolescence are inconsistent. Patterson and Yoerger (1991), Ryan and Powelson (1991), and Stevenson and Baker (1987) found positive effects of parental involvement on academic achievement; however, significant relationships between parental involvement and academic achievement were not found by Keith (1986), Steinberg and others (1992), and Taylor (1996). Grolnick and Slowiaczek (1994) measured paternal and maternal involvement by asking students how much they perceive their parents involve in their academic and social lives with questions such as “My mother keeps close track of how well I am doing in school” and “My father always knows where I am and what I am doing.” They found that maternal involvement was negatively related to performance.

Keith and his colleague (1993) have attributed this inconsistency to how different researchers have defined components of parental involvement in their studies. For example, some researchers define parental involvement as educational aspiration, or as parent-child communications in terms of the amount of discussion related to classes, programs, and experiences at school, or as the amount of home structure (family rules about maintaining grade point average). Other researchers define parental involvement as participation in school activities (school meetings or volunteer work). As Grolnick and Slowiaczek (1994) indicated, parental involvement involves multiple dimensions instead of one unique dimension. Multiple dimensions may include expressing concern about the child’s school grade and homework, attending parent-teacher conferences, volunteering school activities or monitoring the child’s homework, or setting rules about how many hours of watching TV are allowed. Different dimensions of parental involvement may have different effects on academic achievement.
**SES, parenting, and academic achievement**

Few studies (DeGarmo, Forgatch, & Martinez, 1999) have shown that the parent-child relationship mediates the relationship between SES and academic achievement. Beyer (1995) presented several studies on the effects of parenting styles and maternal employment on children’s academic achievement. In her model, parenting style was a mediator between maternal employment and academic achievement. Patterns of employment, child care, role satisfaction, gender of the child, and father’s behavior moderated the relationship between maternal employment and children’s academic achievement. In DeGarmo, Forgatch, and Martinez’s (1999) study of young boys aged six to nine from divorced families, maternal income, education, and occupation were associated with positive parenting, which, in turn, influenced school behavior, leading to higher school achievement.

In this study, the direct effect of SES on academic achievement and the indirect effect of SES on academic achievement via parenting will be examined. Based on previous studies, SES is thought to have a positive impact on both parenting and adolescents’ academic achievement. Parenting is hypothesized to act as a mediator variable in the relationships between SES and adolescents’ academic achievement.

**Gender Differences in Academic Achievement**

A further purpose of this dissertation is to investigate whether the relationships among parental education, income, occupational prestige, parenting, academic achievement, and adolescent self-esteem are different for male and female adolescents.

Reports of both the absence and the presence of gender differences in academic achievement exist in the literature. Some have argued that there are gender differences in academic achievement (Considine & Zappala, 2002), particularly in mathematics and
reading. For example, in a study of gender differences in academic achievement from grades one through six, Allred (1990) found that girls performed better than boys in terms of spelling. Females had higher scores in reading but lower scores in mathematics than males (Tremblay, Inman, & Willms, 2000). High school female students with advanced mathematics achieved better than did male students with advanced mathematics; males with a medium level of mathematics outperformed their female counterparts with a medium level (Han, 1993). This shows the interaction of gender and the level of mathematics. In a study of the outstanding academic achievements of gifted girls in British grade schools, Freeman (2003) noted that British gifted girls had greater self-confidence than gifted boys. British curriculum and assessment appear to favor gifted girls more; there also is a great emphasis on equal gender opportunities in the classroom. Undergraduate female students had higher general achievement than did the males (Lindgram et al., 1986). Women achieved better in college statistics courses (Brooks, 1987), particularly in courses that were taught by women (Brooks & Mercincavage, 1991). In a meta-analysis study, Schram (1996) found that undergraduate women outperformed their male counterparts in total course performance as well as courses offered in the business college.

On the other hand, some researchers also argue that male students are better than female students in mathematics (Han & Hoover, 1994). From eighth to twelfth grade, male students increasingly outperformed female students in multiple-choice questions in practical and advanced mathematics and natural sciences (Fierros, 1999). Female students performed less well in science subjects than did male students (Lupart, Cannon, Telfer, 2004). In a study of gender differences in mathematics achievement with 739 boys and 758 girls (all were fifteen years old), Bolger and Kellaghan (1990) found that boys performed better than girls
on multiple-choice tests. Schram (1996) also found that undergraduate males outperformed females in a series of exams in university psychology, education, and business courses.

Such inconsistent results may be due to inter-group ethnic and SES differences in gender stereotypes, expectations and gender-related norms (Extrom, 1994; Grossman & Grossman, 1994), parental socialization (Steinberg, 2000), cultural perceptions (Klein, 2004), traditional feminine values (Smith, 1992), or the type of assessment (Freeman, 2003). In a study of third graders (94 girls and 100 boys) and junior high school students (143 girls and 136 boys), Stipek and Gralinski (1991) found that girls seem to have more negative perceptions of their own abilities, lower expectations, and were more likely to attribute failure to low ability as compared to boys. Those attribution styles may affect motivation of academic achievement, which influences actual academic achievement. Science teachers also asked boys more difficult questions and interacted with more boys than with girls (Altermatt et al., 1998). Furthermore, the type of questions asked in exams may influence the relationship between gender and academic achievement. For instance, high school boys did better than girls on multiple choice tests in history and civics, whereas there was no gender difference in open-question exams in history and civics (Levi, 1989). Other researchers (Borg & Falzon, 1993; Klein, 2004) have proposed that the gender of teachers affects gender-related academic outcomes in addition to the effects of gender of the students. In a study of 3,446 Israeli students (grades five through eleven) from middle-class families, Klein (2004) studied whether the teacher’s or student’s gender affects student’s scholastic achievement. The samples also included 1,720 female teachers and 1,726 male teachers who taught humanities (such as literature and history), mathematics, and exact sciences (such as chemistry and physics). The researcher suggested that gender-related academic achievement
could be more attributed to the gender of the teacher than to the gender of the students. His finding supports sociological explanations instead of biological explanations of gender differences in academic achievement. A sociological theory attributes the differences in academic achievement to cultural stereotypes and perceptions.

**Gender Differences in Self-Esteem**

Female adolescents tend to have lower self-esteem than male adolescents (Cairns, McWhirter, Duffy, & Barry, 1990; Chubb, Fertman, & Ross, 1997; Harter, 1998; Raymore, Godbey, & Crawford, 1994; Richards, Gitelson, Petersen, & Hurtig, 1991; Richman, Clark, & Brown, 1985; Roberts et al., 2000; Ross & Broh, 2000; Savin-Williams & Demo, 1984; Tremblay, Inman, & Willms, 2000). In a study of fifth and sixth graders, Kawash, Kerr, and Clewes (1985) reported that self-esteem for boys was related more strongly to parental acceptance and discipline, while girls’ self-esteem was related more strongly to parental autonomy. In Gecas and Schwalbe’s (1986) study of the relationship between parental behavior and self-esteem of 128 subjects (seventeen to twenty-nine years of age), boys’ self-esteem was related more strongly to control/autonomy aspects of parental behavior, whereas girls’ self-esteem was affected more strongly by parental support and participation. Hoffman, Ushpiz, and Levy-Shiff (1988) found that maternal support was more strongly related than paternal support with self-esteem in 76 Israeli male and female adolescents aged fourteen to twenty-six. Betz, Wohlgemuth, Serling, and Harshbarger (1995) found that females’ self-regard was significantly related to the unconditional positive regard they perceived from their mothers. Richards, Gitelson, Petersen, and Hurtig (1991) found male adolescents (aged seventeen and eighteen) who perceived their mother to be warm and supportive, to have higher self-esteem. Female adolescents who perceived their fathers to be warm and
supportive had higher self-esteem. Self-esteem of female adolescents was related more strongly to paternal behaviors, whereas self-esteem of adolescent boys was related more strongly to maternal behaviors. In Richards, Gitelson, Petersen, and Hurtig’s (1991) study, male and female adolescents’ self-esteem seems to be susceptible to the behaviors of the opposite-sex parents. Researchers have attributed the differences in self-esteem to parental socialization (Wentzel, 1994). That is, the different ways boys and girls are treated at home affect the development of their self-esteem. Parents may monitor their adolescent sons less than their adolescent daughters and might give their sons more freedom which may increase the adolescent son’s self-confidence and self-worth while parents may restrict their adolescent daughter’s behavior with parental control. Therefore, an adolescent daughter may have lower self-esteem than an adolescent son. Gender effects should be considered in the model to be evaluated in this study.

**Gender Differences in the Relationships among SES, Parenting, Adolescents’ Academic Achievement and Self-Esteem**

How does the gender of the child or the parents influence the relationships among parenting, academic achievement and self-esteem during the early and middle adolescent years? Parents may encourage boys and girls to engage in different play activities. They may encourage boys to play with blocks or other construction objects, while they encourage girls to play with dolls. Those activities may foster children’s cognitive and social development differentially (Liss, 1983; Miller, 1987). For example, playing with building blocks may develop spatial and mechanical skills and playing the dolls with friends may develop social and language skills (O’Brien & Nagle, 1987). This, in turn, may foster gender differences in particular academic areas.
From the early stages of development, caregivers may buy more feminine clothing and toys for little girls and more sports equipment for little boys (Roble & Martin, 1998). Does parenting affect self-esteem of boys and girls differently? Few studies (Gecas & Schwalbe, 1986; Kawash, Kerr, & Clewes, 1985) have shown that young children’s self-esteem is affected by different dimensions and natures of parenting. By means of different dimensions of parenting styles, Gecas and Schwalbe (1986) suggested that boys’ self-esteem was more affected by parental control, while girls’ self-esteem was more affected by parental support and participation. Richards, Gitelson, Petersen, and Hurtig (1991) found that female’s self-esteem was more related to paternal warmth and support while male’s self-esteem was more related to maternal warmth and support.

Few studies had examined the relationships among SES, parenting, academic achievement, and self-esteem. This dissertation will further investigate gender effects in the relationships among SES, parenting, academic achievement, and self-esteem in early and middle adolescence in a three-year longitudinal study. Specifically, the indirect effects of parental education, occupational prestige and income on adolescents’ self-esteem through parenting will be examined. The level of family income, paternal and maternal education, and occupational prestige will be composed into one latent construct (namely, SES) in the structural equation models. Paternal and maternal perceptions of their own parenting and adolescents’ perceptions of paternal and maternal parenting will be constructed into one parenting construct. Academic achievement will be based on parental and adolescents’ reports of how well the adolescent child does in four areas at school. Self-esteem will be based on parental and adolescents’ reports of the adolescent child’s self-esteem.
Hypotheses

Based on the studies reviewed, the following structural model is proposed (see Figure 1). SES is hypothesized to have a direct positive effect on nurturant parenting, on adolescents’ academic achievement, and on adolescents’ self-esteem, and a direct negative effect on punitive parenting. It is further hypothesized that nurturant parenting will have a direct negative effect on punitive parenting and a direct positive effect on adolescents’ academic achievement and on adolescents’ self-esteem, and that adolescents’ academic performance will have a direct positive effect on adolescents’ self-esteem. Punitive parenting will have a direct negative effect on adolescents’ academic achievement and on adolescents’ self-esteem. SES is hypothesized to have an indirect positive effect on adolescents’ academic achievement and self-esteem, through nurturant parenting, and to have an indirect negative effect on academic achievement and self-esteem, through punitive parenting. Nurturant parenting, too, will have an indirect positive effect on self-esteem through academic achievement. Punitive parenting will have an indirect negative effect on self-esteem through academic achievement.

It is hypothesized that gender will act as a moderator variable in the relationships among SES, nurturant parenting, punitive parenting, adolescent academic achievement, and adolescent self-esteem, and that the structural model of interest in the present study therefore will not be invariant across female and male adolescents.
Figure 1. Conceptual Model

- SES at wave 1
- nurturant parenting at wave 2
- punitive parenting at wave 2
- academic achievement at wave 2
- self-esteem at wave 3

Positive

Negative
CHAPTER 3. METHODOLOGY

Participants

Participants in this sample included 186 adolescent daughters and 188 adolescent sons with their parents and one sibling from 374 families. The sample came from twenty-seven public school districts with a K-6 (elementary school), 7-8 (junior high), and 9-12 (senior high) school structure in a Midwestern state. The twenty-seven school districts were chosen to constitute a stratified random sample (by size: small and large; and by geographical area: north-east, north-west, south-east, and south-west) of all state public school districts with that organizational structure. The participants were recruited for a three-wave longitudinal study conducted by Lempers and Clark-Lempers (1997) for evaluating stress-distress mediation models of the relationships among economic hardship, family relationships, and adolescent distress.

The parents were sent a letter describing the nature of the three-year longitudinal research project, a short consent form, a questionnaire, and a stamped return envelope. The short consent form was included for the parents to indicate whether or not they agreed to participate. The short questionnaire was used to ascertain if the family met the criteria for participation. These criteria were that the adolescent child was a sixth or an eighth grader, that there were two parents (a mother and father) in the home, and that the adolescent child had a sibling within three years of age. They were requested to participate as a family and were reimbursed $75.00 for each family visit. Of the 726 families that were screened, 464 were eligible for the study, and 398 agreed to participate. The total number of participants in this study was 398 adolescents and their parents, together with one sibling, during the first wave of measurement, 382 during the second wave of measurement, and 374 during the third
wave of measurement. Of the 186 female adolescents, 87 were sixth graders and 99 were eighth graders. Of the 188 male adolescent, 87 were sixth graders and 101 were eighth graders. After deleting missing values for the variables used in this dissertation study, the sample consists of 282 adolescents, 69 sixth-grade female adolescents, 65 sixth grade male adolescents, 78 eighth grade female adolescents, and 70 eighth grade male adolescents, and their parents (see Table 2).

**Measures**

**Paternal and maternal education at wave 1**

For each mother and father, the highest grade of regular school completed was obtained (see the Appendix 1). The descriptive statistics will be reported in the result section.

**Paternal and maternal occupational prestige at wave 1**

Mothers’ and fathers’ occupations were scored with a scoring system devised with the assistance of the Survey section of the Statistical Laboratory at Iowa State University. These occupation scores were changed into occupational prestige scores (see Appendix 2) by using the occupational prestige score coding manual of The National Opinion Research Center (NORC), which was developed initially by R. W. Hodge, P. S. Siegel and P. H. Rossi in 1963-1965 and updated for the 1989 General Survey Study (GSS) by R. W. Hodge, J. Treas, and K. Nakao. The prestige scores are derived from the ratings of respondents of the social standing of each occupation using a 1 to 9 rating scale, with 1 being labeled bottom, 5 being labeled middle, and 9 being labeled top. Each occupation has one prestige score. Because the list of occupations used in this study used categorical labels (e.g., skilled craftsman) instead of specific occupation labels (e.g., plumber), the mean prestige score of the category was assigned.
Family income at wave 1

Family income was determined by asking both mothers and fathers to specify both personal income and total family income for all members of the family before taxes for the tax year preceding the then current wave of measurement. Total family income was calculated by adding up both parental reports of family income and dividing by 2. For eleven missing cases of maternal reports of family income, only the paternal reports of family income were used.

Parenting at wave 2

Fathers’, mothers’, and adolescents’ perceptions of parenting were measured by twenty-one items taken from the Child’s Report of Parental Behavior Inventory (Schaefer, 1965) and the Child Rearing Practice Reports (Roberts, Block, & Block, 1984). The 21 items were selected to represent nurturant parenting, inconsistent, punitive parenting and parental monitoring. The 21 items were derived from both inventories, rewritten to follow the format of the other questionnaires used in the study, and all were coded so that higher scores indicated more positive parenting (see Appendix 3).

Cronbach’s alpha coefficients for paternal and maternal parenting, and for adolescents’ perceptions of paternal and maternal parenting at wave 2, are .79, .71, .83, and .77, respectively. Principal-axis factor analyses with quartimax rotation were run for each of the four sets of the 21 parenting items (the father’s perception of his own parenting, the mother’s perception of her own parenting, and the adolescents’ perceptions of paternal and maternal parenting) at wave 2. The factor analysis results are reported in Table 1. Only factor items with a loading of .40 or higher on one factor were retained for further analysis. A factor must have at least three items with loadings of .40 or higher to be retained.
Table 1. Rotated factor matrix for paternal, maternal, and adolescents’ perceptions of paternal and maternal parenting at wave 2

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<tr>
<th>Items</th>
<th>Father's perception of his own parenting at wave 2</th>
<th>Mother's perception of her own parenting at wave 2</th>
<th>Adolescent's perception of paternal parenting at wave 2</th>
<th>Adolescent's perception of maternal parenting at wave 2</th>
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<td>-.10  .47  -.12  -.10  .50  .04  -.08  .44  -.08  -.15  .39  .00  .02</td>
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<td>21</td>
<td>-.09  .40  -.01  -.22  .47  -.02  -.01  .43  -.05  -.11  .27  -.08  .70</td>
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As shown in Table 1, items 1, 2, 8, 12, 16, 18, and 19 all loaded on the same factor for fathers’ perception of their own parenting, for mothers’ perception of their own parenting, and for adolescents’ perceptions of paternal and maternal parenting. Example items are “let you know you were appreciated, loved, and respected,” “Say nice things to you,” “Feel proud of the things you did,” and “Listen to your ideas and opinions.” Given the nature of these items, they together constituted the factor of nurturant parenting. With 7 items on this factor, and with each item coded on a 1 – 5 scale, the range of possible scores on the nurturant parenting factor is from 7 to 35. Cronbach’s alpha coefficients for paternal and maternal perceptions of nurturant parenting, and for adolescents’ perceptions of paternal and maternal nurturant parenting for wave 2, are .89, .86, .91, and .90, respectively.

Table 1 also shows that parenting items 6, 7, 9, 13, and 14 loaded on the same factor for fathers’, mothers’, and adolescents’ perceptions of parenting at wave 2. Items 6, 7, 9, 13, and 14 are “threaten punishment more often than she used it,” “Nag you about little things,” “Scold you for disobeying or misbehaving,” “Get angry and yell at you,” and “Punish you by grounding you or sending you to your room.” Given the nature of these items, they constituted the factor of punitive parenting. The range of scores on this second factor is between 5 and 25. Cronbach’s alpha coefficients for paternal and maternal perceptions of punitive parenting, and adolescents’ perceptions of paternal and maternal punitive parenting, for wave 2 are .80, .79, .78, and .76, respectively.

**Adolescent’s academic achievement at wave 2**

Mothers, fathers, and the adolescents themselves rated the adolescent’s school performance in the most recent completed semester in four areas: (1) reading, English, and writing, (2) math, (3) spelling, and (4) other subjects such as history, science, geography, or
foreign language. The ratings used were 0 = not sure, 1 = failing, 2 = below average, 3 = average, 4 = above average, and 5 = way above average. The range of scores across the 4 areas is from zero to 20. Cronbach’s alpha coefficients for academic achievement as perceived by fathers, mothers, and adolescents are .94, .93, and .68, respectively.

**Adolescent self-esteem at wave 3**

The Rosenberg Self-Esteem Scale (Rosenberg, 1965, see Appendix 4) was used to assess fathers’ and mothers’ perceptions of adolescents’ self-esteem as well as adolescents’ perceptions of their own self-esteem. The ten questions were scored on a 4-point scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree), and the questions were coded so that higher scores indicated more self-esteem. The range of possible scores is between 10 and 40. Cronbach’s alpha coefficients for fathers’, mothers’, and adolescents’ perceptions of adolescent self-esteem are .88, .89, and .80, respectively.

**Procedure**

The twelve interviewers for the longitudinal project conducted by Lempers and Clark-Lempers (1997) were middle-aged females who were recruited by the Survey Section of the Statistical Laboratory at Iowa State University. Training workshops were held by the Survey Section for the twelve experienced interviewers to familiarize them with all the items and their coding on all the questionnaires that needed to be administered.

During the first home visit, the interviewers first reviewed the project with all family members (mother, father, the adolescent child, and sibling), then had them sign the informed consent form if they still were willing to participate, and informed them how to proceed in answering the questions on the questionnaire. If needed, the interviewer answered participants’ questions.
During the interview, each family member was requested to complete his or her questionnaire individually in a separate room if at all possible. The interviewer checked the completed questionnaire of each participant; if it was not answered completely, the interviewer requested that the respondent answer the unanswered questions. At the end of the interview, the family was thanked for their participation and provided with their reimbursement. They also were informed that the Survey Section would contact them for two more visits. The total visit time varied from an hour to an hour and a half.
CHAPTER 4. RESULTS

The Statistical Package for the Social Sciences (SPSS 11.1) was used to run descriptive statistics, correlations, factor analyses, multiple regression, analyses of variance, and multivariate analyses of variance. LISREL 8.5 (Jöreskog & Sörbom, 1989, 1996a, 1996b) was used to estimate the structural equation models (Byrne, 1998).

Descriptive Statistics

Descriptive statistics (means and standard deviations) for total family income, paternal and maternal levels of education, and paternal and maternal occupational prestige score are reported in Table 2.

Table 2. Descriptive statistics for total family income, paternal and maternal education, and occupational prestige score by gender and grade

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<th>Std. Deviation</th>
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</thead>
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<td>70</td>
</tr>
<tr>
<td></td>
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<td>Father's occupation prestige</td>
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<td>65</td>
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<td>78</td>
<td>70</td>
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<td>135</td>
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<tr>
<td>Mother's occupation prestige</td>
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<td>65</td>
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<td>78</td>
<td>70</td>
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<tr>
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<td>135</td>
</tr>
</tbody>
</table>

Notes:
F refers to female adolescents
M refers to male adolescents
Means and standard deviations for nurturant parenting and punitive parenting at wave 2 are reported in Table 3. Descriptive statistics for academic achievement at wave 2 and for self-esteem at wave 3 are reported in Table 4.

Table 3. Descriptive statistics for parenting by gender and grade

<table>
<thead>
<tr>
<th>Grade</th>
<th>N</th>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
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Notes:
F refers to female adolescents
M refers to male adolescents
Table 4. Descriptive statistics for adolescents’ academic achievement and self-esteem by gender and grade

<table>
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<tr>
<th>Gender</th>
<th>N</th>
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<th>Std. Deviation</th>
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<tr>
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</tr>
<tr>
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<tr>
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<tr>
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<tr>
<td>Adolescents’ academic achievement as perceived by the mother at wave 2</td>
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Notes:
F refers to female adolescents
M refers to male adolescents
Correlations

Bivariate correlation coefficients estimate the strength of the linear association between variables in the study. Correlations will be reported for paternal and maternal education, total family income, paternal and maternal occupational prestige, nurturant and punitive parenting as perceived by the fathers, the mothers and the adolescent children, adolescent academic achievement as perceived by the fathers, the mothers, and the adolescent children, and adolescent self-esteem, again as perceived by the fathers, the mothers, and the adolescent children.

The correlations are discussed, based on whether or not (1) the five indicators of SES are correlated with each other; (2) the eight measures of parenting are correlated with each other; (3) the three measures of academic achievement are correlated with each other; and (4) the three measures of self-esteem are correlated with each other.

Table 5 shows the correlations among total family income, maternal and paternal education, maternal and paternal occupational prestige, the parenting variables, the academic achievement variables, and the self-esteem variables for female adolescents. Sixty-five out of 171 correlations are significant; 106 correlations are not significant. Total family income, father’s occupational prestige score, father’s education, and mother’s education are significantly correlated with each other, but total family income and mother’s occupational prestige scores are not. Significant correlations among the eight measures of parenting are found between paternal nurturant parenting as perceived by the fathers and maternal punitive parenting as perceived by the mothers; between maternal nurturant parenting as perceived by the mothers and three measures of punitive parenting (maternal punitive parenting as perceived by the mothers and the adolescent child, paternal punitive parenting as perceived
by the adolescent child); and between maternal nurturant parenting as perceived by the adolescent child and two measures of punitive parenting (paternal and maternal punitive parenting as perceived by the adolescent child). All academic achievement measures are significantly correlated with each other; however, none of self-esteem measures are significantly correlated with each other.

Table 5. Correlations among SES, parenting, academic achievement, and self-esteem for female adolescents

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** Correlation is significant at the 0.01 level 2-tailed.
* Correlation is significant at the 0.05 level 2-tailed.
Table 6 shows correlations among total family income, paternal and maternal education, paternal and maternal occupational prestige, the parenting variables, the academic achievement variables and the self-esteem variables for male adolescents. Eighty-six out of 171 correlations are significant; 85 correlations are not significant. Total family income, fathers' occupational prestige scores, mothers' occupational prestige scores, fathers' education, and mothers' education are all significantly correlated with each other. Of the four measures of nurturant parenting all are significantly correlated with each other, except maternal nurturant parenting as perceived by the mothers and paternal nurturant parenting as perceived by the adolescent child. All four measures of punitive parenting are significantly correlated with each other. Significant correlations among eight measures of parenting are found for paternal nurturant parenting as perceived by the fathers and three measures of punitive parenting (paternal punitive parenting as perceived by the fathers and the adolescent child and maternal punitive parenting as perceived by the mothers), for maternal nurturant parenting as perceived by the mothers and two measures of punitive parenting (paternal punitive parenting as perceived by the fathers and maternal punitive parenting as perceived by the mothers), for paternal nurturant parenting as perceived by the adolescent child and two measures of punitive parenting (paternal and maternal punitive parenting as perceived by the fathers and maternal punitive parenting as perceived by the adolescent child); and for maternal nurturant parenting as perceived by the adolescent child and maternal punitive parenting as perceived by the adolescent child. All three measures of academic achievement are significantly correlated with each other. However, the three measures of self-esteem are not significantly correlated with each other.
Table 6. Correlations among SES, parenting, academic achievement, and self-esteem for male adolescents

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** Correlation is significant at the 0.01 level 2-tailed.
* Correlation is significant at the 0.05 level 2-tailed.

Table 7 shows correlations among total family income, maternal and paternal education, maternal and paternal occupational prestige scores, the parenting variables, the academic achievement variables, and the self-esteem variables for 6th-grade adolescents. Sixty-five out of 171 correlations are significant; 106 correlations are not significant. All five indicators of SES are significantly correlated with each other except for total family income and maternal occupational prestige scores. Paternal nurturant parenting as perceived by the fathers and paternal punitive parenting as perceived by the fathers are significantly correlated with each other. Maternal nurturant parenting as perceived by the mothers and three measures of punitive parenting (paternal punitive parenting as perceived by the adolescent
child, and maternal punitive parenting as perceived by the mothers and the adolescent child) are significantly correlated. All three measures of academic achievement variables also are significantly correlated with each other. However, the three measures of self-esteem are not significantly correlated with each other.

Table 7. Correlations among SES, parenting, academic achievement, and self-esteem for 6th-grade adolescents

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** Correlation is significant at the 0.01 level 2-tailed.
* Correlation is significant at the 0.05 level 2-tailed.
Table 8 shows correlations among total family income, maternal and paternal education, maternal and paternal occupational prestige scores, the parenting variables, the academic achievement variables, and the self-esteem variables for 8th-grade adolescents. Eighty-two out of 171 correlations are significant; eighty-nine are not significant. All five measures of socioeconomic status indicators are significantly correlated with each other. All four measures of nurturant parenting are significantly correlated with each other except maternal nurturant parenting as perceived by the mothers and paternal nurturant parenting as perceived by the adolescent child. All four measures of punitive parenting are significantly correlated with each other. Significant correlations among the nurturant and punitive measures of parenting are found between paternal nurturant parenting as perceived by the fathers and three measures of punitive parenting (paternal punitive parenting as perceived by the fathers, the mothers, and the adolescent child); between maternal nurturant parenting as perceived by the fathers and three measures of punitive parenting (paternal punitive parenting as perceived by the fathers and the mothers, and maternal punitive parenting as perceived by the adolescent child); between paternal nurturant parenting as perceived by the adolescent child and two measures of punitive parenting (paternal punitive parenting as perceived by the fathers and the adolescent child); and between maternal nurturant parenting as perceived by the adolescent child and three measures of punitive parenting (maternal punitive parenting as perceived by the mothers and the adolescent child as well as paternal punitive parenting as perceived by the adolescent child). All three measures of academic achievement are significantly correlated with each other. Of the measures of self-esteem, only the adolescents’ self-esteem as perceived by the mothers and as perceived by the adolescent child are significantly correlated with each other.
Table 8. Correlations among SES, parenting, academic achievement, and self-esteem for 8th-grade adolescents

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** Correlation is significant at the 0.01 level 2-tailed.
* Correlation is significant at the 0.05 level 2-tailed.

Correlations for female, male, 6th-grade, and 8th-grade adolescents showed certain patterns. First, all SES indicators are significantly correlated with each other for male adolescents and 8th-grade adolescents. Maternal occupational prestige scores are not significantly correlated with total family income for female adolescents and 6th-grade adolescents. Second, the self-esteem variables are not significantly correlated with each other or any socioeconomic status indicator for female, male, and 6th-grade adolescents. Maternal, paternal, and adolescent perceptions of adolescent self-esteem are not correlated, except for 8th-grade adolescents, in which adolescents’ report of their own self-esteem is
significantly correlated with maternal reports of adolescents’ self-esteem.

**Multiple Regressions**

Multiple regressions were performed with the parenting variables, the academic achievement variables, and the adolescent self-esteem variables as outcome variables, and total family income, paternal and maternal education, and paternal and maternal occupational prestige as predictor variables. The standardized partial regression coefficients for education, income, and occupational prestige tell how much the predicted value for the outcome variables changes positively or negatively with a unit change in a predictor variable with all other predictor variables partialled out. This way the unique contribution of each predictor variable to the outcome variable can be determined.

The only significant regression results were found among the academic achievement variables (see Table 9). Fathers’ and mothers’ education significantly predicted adolescents’ academic achievement as assessed by the mothers. Fathers’ education is a significant predictor of adolescents’ academic achievement as assessed by the fathers. Fathers’ and mothers’ education did not significantly predict adolescents’ academic achievement as assessed by the adolescent themselves.

**Table 9. Multiple regression analyses with standardized coefficients**

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<th>Dependent variables</th>
<th>Adolescents’ academic achievement as perceived by the fathers at wave 2</th>
<th>Adolescents’ academic achievement as perceived by the mothers at wave 2</th>
<th>Adolescents’ academic achievement as perceived by the adolescent child at wave 2</th>
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MANOVA

Several MANOVAs, with gender and grade as the categorical variables, were run for the socioeconomic variables (total family income, fathers’ and mothers’ education, fathers’ and mothers’ occupational prestige scores), for the parenting variables, the adolescents’ self-esteem variables, and the academic achievement variables.

Table 10. Wilks’ Lambda for socioeconomic status at wave 1

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Table 10 shows the MANOVA results for the SES indicators (family income, paternal and maternal occupational prestige scores, paternal and maternal educational levels).

There are no significant MANOVA effects for grade, gender, or gender by grade interaction.

Table 11. Wilks’ Lambda for punitive parenting at wave 2

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<td>.99</td>
<td>.66</td>
<td>4</td>
<td>275</td>
</tr>
</tbody>
</table>

As shown in Table 11, the MANOVA results for punitive parenting as perceived by the fathers, the mothers, and the adolescents at wave 2 showed that there is a significant effect for grade (Wilks’ Lambda (4, 275) = 0.950, F=3.597, p < .007). Table 12 show that the effect of grade was significant for father’s punitive parenting as perceived by the fathers at
wave 2 \((F(1, 280)=4.049, p < 0.045)\) and for mothers’ punitive parenting as perceived by the mothers at wave 2 \((F(1, 280)=4.345, p < 0.038)\). As shown in Figure 2, the fathers of 6th-grade adolescents have higher scores on punitive parenting than do the fathers of 8th-grade adolescents; the same is the case for the mothers (as shown in Figure 3). No significant grade effects were found for maternal or paternal punitive parenting as perceived by the adolescents.

Table 12. MANOVA for punitive parenting at wave 2

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>(F)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>t2punit</td>
<td>71.26(a)</td>
<td>3</td>
<td>23.75</td>
<td>2.02</td>
<td>.112</td>
</tr>
<tr>
<td></td>
<td>m2punit</td>
<td>79.48(b)</td>
<td>3</td>
<td>26.49</td>
<td>2.40</td>
<td>.068</td>
</tr>
<tr>
<td></td>
<td>t2fpunit</td>
<td>52.10(c)</td>
<td>3</td>
<td>17.59</td>
<td>1.02</td>
<td>.384</td>
</tr>
<tr>
<td></td>
<td>t2mpunit</td>
<td>80.40(d)</td>
<td>3</td>
<td>26.80</td>
<td>1.43</td>
<td>.234</td>
</tr>
<tr>
<td></td>
<td>f2punit</td>
<td>62685.46</td>
<td>1</td>
<td>62685.46</td>
<td>5320.30</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>m2punit</td>
<td>68211.20</td>
<td>1</td>
<td>68211.20</td>
<td>6185.81</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>t2fpunit</td>
<td>49439.20</td>
<td>1</td>
<td>49439.20</td>
<td>2898.63</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>t2mpunit</td>
<td>59411.01</td>
<td>1</td>
<td>59411.01</td>
<td>3174.57</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>t2punit</td>
<td>45.56</td>
<td>1</td>
<td>45.56</td>
<td>3.87</td>
<td>.050</td>
</tr>
<tr>
<td></td>
<td>m2punit</td>
<td>45.64</td>
<td>1</td>
<td>45.64</td>
<td>4.14</td>
<td>.043</td>
</tr>
<tr>
<td></td>
<td>t2fpunit</td>
<td>6.45</td>
<td>1</td>
<td>6.45</td>
<td>.38</td>
<td>.539</td>
</tr>
<tr>
<td></td>
<td>t2mpunit</td>
<td>62.21</td>
<td>1</td>
<td>62.21</td>
<td>3.32</td>
<td>.069</td>
</tr>
</tbody>
</table>

a R Squared = .021 (Adjusted R Squared = .011)
b R Squared = .025 (Adjusted R Squared = .015)
c R Squared = .011 (Adjusted R Squared = .009)
d R Squared = .015 (Adjusted R Squared = .005)
Figure 2. Grade effect of punitive parenting as perceived by the fathers of 6th-grade and 8th-grade adolescents at wave 2

Figure 3. Grade effect of punitive parenting as perceived by the mothers of 6th-and 8th-grade adolescents at wave 2
Table 13. Wilks’ Lambda for academic achievement at wave 2

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>Wilks’ Lambda</td>
<td>.03</td>
<td>2768.78</td>
<td>3.00</td>
<td>276.00</td>
</tr>
<tr>
<td>grade</td>
<td>Wilks’ Lambda</td>
<td>.99</td>
<td>.49</td>
<td>3.00</td>
<td>276.00</td>
</tr>
<tr>
<td>gender</td>
<td>Wilks’ Lambda</td>
<td>.95</td>
<td>4.61</td>
<td>3.00</td>
<td>276.00</td>
</tr>
<tr>
<td>grade * gender</td>
<td>Wilks’ Lambda</td>
<td>1.00</td>
<td>.33</td>
<td>3.00</td>
<td>276.00</td>
</tr>
</tbody>
</table>

As shown in Table 13, the MANOVA results for academic achievement as perceived by the fathers, the mothers and the adolescents showed that there is a significant effect for gender (Wilks’ Lambda (3, 276)= 0.95, \( p < 0.004 \)). Table 14 shows that there is a significant effect of gender for adolescents’ academic achievement as perceived by the fathers (\( F(1,280)= 10.357, \ p < 0.001 \)) and by the mothers (\( F(1, 280)=10.701, \ p < 0.001 \)). Figure 4 shows that the ratings of academic performance given by fathers of adolescent daughters were higher than the ratings of academic performance given by the fathers of adolescent sons. Figure 5 shows that the same is the case for the mothers.

Table 14. MANOVA for academic achievement at wave 2

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>( t^2_{acade} )</td>
<td>118.28(a)</td>
<td>3</td>
<td>39.43</td>
<td>3.94</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>( m^2_{acade} )</td>
<td>131.23(b)</td>
<td>3</td>
<td>43.74</td>
<td>3.83</td>
<td>.010</td>
</tr>
<tr>
<td></td>
<td>( t^2_{acade} )</td>
<td>22.78(c)</td>
<td>3</td>
<td>7.59</td>
<td>.91</td>
<td>.436</td>
</tr>
<tr>
<td>Interception</td>
<td>( f_2_{acade} )</td>
<td>59252.08</td>
<td>1</td>
<td>59252.08</td>
<td>5921.27</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>( m_2_{acade} )</td>
<td>58911.80</td>
<td>1</td>
<td>58911.80</td>
<td>5152.67</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>( t_2_{acade} )</td>
<td>59386.55</td>
<td>1</td>
<td>59386.55</td>
<td>7121.89</td>
<td>.000</td>
</tr>
<tr>
<td>grade</td>
<td>( f^2_{acade} )</td>
<td>14.06</td>
<td>1</td>
<td>14.06</td>
<td>1.41</td>
<td>.237</td>
</tr>
<tr>
<td></td>
<td>( m^2_{acade} )</td>
<td>5.81</td>
<td>1</td>
<td>5.81</td>
<td>.51</td>
<td>.476</td>
</tr>
<tr>
<td></td>
<td>( t^2_{acade} )</td>
<td>2.10</td>
<td>1</td>
<td>2.10</td>
<td>.25</td>
<td>.616</td>
</tr>
<tr>
<td>gender</td>
<td>( f^2_{acade} )</td>
<td>101.55</td>
<td>1</td>
<td>101.55</td>
<td>10.15</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>( m^2_{acade} )</td>
<td>123.05</td>
<td>1</td>
<td>123.05</td>
<td>10.76</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>( t^2_{acade} )</td>
<td>20.52</td>
<td>1</td>
<td>20.52</td>
<td>2.46</td>
<td>.118</td>
</tr>
</tbody>
</table>

\( a \) R Squared = .041 (Adjusted R Squared = .030)
\( b \) R Squared = .040 (Adjusted R Squared = .029)
\( c \) R Squared = .010 (Adjusted R Squared = .001)
Figure 4. Gender effect for male and female adolescents’ achievement as perceived by the fathers at wave 2

Figure 5. Gender effect for male and female adolescents’ achievement as perceived by the mothers at wave 2
Structural Equation Model

The following data analyses will try to answer six major questions relating to the hypothesized model:

1. Across all subjects, is the hypothesized model a well-fitted model?
2. Are one or more parsimonious models, which are models with less hypothesized relations between the latent constructs than the hypothesized model and which are also nested within the hypothesized model, better-fitting models than the hypothesized model?
3. Is the model with the best fit across all subjects a well-fitted model for the subgroups of female or male adolescents?
4. Are the structural coefficients in the structural model invariant across the subgroups of female and male adolescents?
5. Is the better-fitting model a well-fitted model for 6th- and 8th-grade adolescents?
6. Are the structural coefficients in the structural model invariant across the subgroups of the 6th- and 8th-grade adolescents?

The full structural equation model consists of a measurement model and a structural model. The measurement model specifies the relationships between a construct and its corresponding indicators or manifest variables, the structural model specifies the relationship between the various constructs or latent factors in the model.

In the measurement model the SES construct will be indicated by the reflective manifest variables of maternal and paternal education, maternal and paternal occupational prestige scores, and total family income. The nurturant parenting construct will be indicated by the variables of mothers’, fathers’, and adolescents’ perceptions of nurturant parenting; the punitive parenting construct will be indicated by the reflective manifest variables of
fathers', mothers', and adolescents' perceptions of punitive parenting. Adolescent academic achievement will be indicated by the reflective manifest variables of fathers', mothers', and adolescents' perceptions of academic achievement. The adolescent self-esteem construct will be indicated by adolescents' and parent's perceptions of adolescent self-esteem.

In the hypothesized structural model (see Figure 1), SES at time 1 is an exogenous construct; nurturant parenting at time 2, punitive parenting at time 2, adolescents' academic achievement at time 2, and self-esteem at time 3 are endogenous constructs, the variances of which are to be explained. SES at time 1 is hypothesized to affect both nurturant and punitive parenting at time 2 and adolescents' academic achievement at time 2, which, in turn, are hypothesized to influence adolescent self-esteem at time 3. Nurturant and punitive parenting and academic achievement thus are hypothesized to act as mediating latent variables in the link between SES and adolescent self-esteem. SES at time 1 is also hypothesized to affect adolescents' self-esteem at time 3 directly. Nurturant and punitive parenting at time 2 are hypothesized to affect academic achievement of adolescents at time 2, and academic achievement at time 2 is hypothesized to act as a mediating variable between nurturant and punitive parenting at time 2 and adolescent self-esteem at time 3.

The structural equation coefficients between SES and nurturant parenting, between SES and academic achievement, between SES and self-esteem, between nurturant parenting and self-esteem, between academic achievement and self-esteem, and between nurturant parenting and academic achievement, are expected to be significant and positive; the coefficients between SES and punitive parenting, between punitive parenting and self-esteem, and between punitive parenting and academic achievement, are expected to be significant and negative. The relationship between a predictor and an outcome variable (e.g.,
between parenting and adolescent self-esteem) should be reduced significantly after adding the mediator variable (e.g., academic achievement) (Baron & Kenny, 1986).

**Fit measures**

For model evaluation, the chi-square values, the Goodness of Fit (GFI) index, the Adjusted Goodness of Fit (AGFI) index, the Root Mean Square Errors of Approximation (RMSEA), and the Standardized Root Mean Square Residuals (SRMR) will be reported. The chi-square statistic is used to test “the closeness of fit between the unrestricted sample covariance matrix S, and the restricted covariance matrix Σ (θ)” (Byrne, 1998, p. 109). A smaller chi-square value, relative to its degrees of freedom, indicates a good fit—how well the model fits the data; a larger chi-square value indicates a bad fit. A chi-square value of zero indicates a perfect fit.

The GFI and AGFI indices measure how much better the model fits when compared to the null, or independence model in which there are no paths between the latent constructs (Jöreskog & Sörbom, 1989). The GFI and AGFI values should between .90 and 1.00 to indicate a good fit. A value of 1.00 indicates a perfect fit. The RMSEA value indicates a good fit, if it is equal to or less than .05; values between 0.05 and 0.08 indicate a reasonable fit and values larger than that a poor fit (Browne & Cudeck, 1993). The SRMR refers to the average standardized residual value between the hypothesized model’s variance-covariance matrix and the sample data’s variance-covariance matrix. Standardized RMR ranges from zero to one; a value between zero and 0.05 indicates a good fit.
**Structural equation modeling for all subjects**

To answer the first question whether the hypothesized model is a well-fitted model across all subjects, LISREL 8.5 was used to evaluate the structural equation model. The signs of the paths in the hypothesized, fully recursive model are all in the predicted direction. Based on the completely standardized coefficients and the corresponding $t$-values, socioeconomic status at time 1 significantly relates to nurturant parenting at time 2 ($\beta = 0.29$) and academic achievement at time 2 ($\beta = 0.18$) positively. Nurturant parenting relates significantly and negatively to punitive parenting at time 2 ($\beta = -0.57$) and significantly and positively to academic achievement at time 2 ($\beta = 0.45$). Adolescents’ academic achievement at time 2 has a positive and significant association with self-esteem at time 3 ($\beta = 0.19$). There are no significant relationships between SES and self-esteem, between nurturant parenting and self-esteem, and between punitive parenting and self-esteem. This model with a chi-square value of 297.37 and 135 degrees of freedom ($p = 0.00012$), a GFI index of 0.93, an AGFI index of 0.90, a RMSEA value of 0.043, and a SRMR value of 0.066, indicates that the model fits the data reasonably well.

To answer the second question, a sequence of nested models will be evaluated: a baseline, or null, model, four parsimonious models ($M_1, M_2, M_3,$ and $M_4$), and the fully recursive model ($M_5$: the hypothesized model). A baseline model ($M_0$) is a model with no paths between the latent constructs. A fully recursive model ($M_5$) is a model with unidirectional paths among all latent constructs.

In model 1 (shown in Figure 6), SES at time 1 is hypothesized to affect nurturant parenting significantly at time 2 positively, but to affect punitive parenting at time 2 negatively; nurturant parenting at time 2 is hypothesized to affect punitive parenting...
significantly at time 2 negatively and affect academic achievement significantly at time 2 positively; punitive parenting at time 2 is hypothesized to affect academic achievement significantly at time 2 negatively. Adolescents’ academic achievement at time 2 is hypothesized to affect adolescents’ self-esteem significantly at time 3 positively.

Figure 6. The first parsimonious model (M1) of the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and self-esteem.
The difference between the second parsimonious model (M2; shown in Figure 7) and the first parsimonious model (M1) is the path indicating a direct effect of SES on academic achievement.

Figure 7. The second parsimonious model (M2) of the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and self-esteem.
The difference between this third parsimonious model (M3; shown in Figure 8) and the second parsimonious model (M2) is the path indicating a direct effect of nurturant parenting on academic achievement.

Figure 8. The third parsimonious model (M3) of the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and self-esteem
The difference between this fourth parsimonious model (M4; shown in Figure 9) and the third parsimonious model (M3) is the path indicating a direct effect of punitive parenting on academic achievement.

Figure 9. The fourth parsimonious model (M4) of the relationships among SES, nurturant parenting, punitive parenting, adolescents' academic achievement, and self-esteem.
The differences between this fully recursive model (M5; shown in Figure 10) and the fourth parsimonious model (M4) is the path indicating a direct effect of SES on self-esteem. All paths are unidirectional.

Figure 10. A fully recursive model (M5) of the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and self-esteem
Model comparisons

The null model (M₀) will be compared to the first parsimonious model (M₁); the first parsimonious model (M₁) will be compared to the second parsimonious model (M₂); the second parsimonious model (M₂) will be compared to the third parsimonious model (M₃); the third parsimonious model (M₃) will be compared to the fourth parsimonious model (M₄); the fourth parsimonious model (M₄) will be compared to the fully recursive model (M₅).

Table 15. Model comparisons

<table>
<thead>
<tr>
<th>Model Comparisons</th>
<th>RMSEA</th>
<th>90 Percent Confidence Interval for RMSEA</th>
<th>RMR</th>
<th>SRMR</th>
<th>GFI</th>
<th>AGFI</th>
<th>χ² or Δχ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₀</td>
<td>0.044</td>
<td>(0.032 ; 0.055)</td>
<td>0.070</td>
<td>0.070</td>
<td>0.93</td>
<td>0.90</td>
<td>χ²(171)=1620.01</td>
</tr>
<tr>
<td>M₁</td>
<td>0.042</td>
<td>(0.030 ; 0.054)</td>
<td>0.069</td>
<td>0.069</td>
<td>0.93</td>
<td>0.90</td>
<td>χ²(139)=217.58</td>
</tr>
<tr>
<td>M₂</td>
<td>0.042</td>
<td>(0.030 ; 0.054)</td>
<td>0.066</td>
<td>0.066</td>
<td>0.93</td>
<td>0.90</td>
<td>χ²(138)=212.38</td>
</tr>
<tr>
<td>M₃</td>
<td>0.042</td>
<td>(0.030 ; 0.054)</td>
<td>0.067</td>
<td>0.067</td>
<td>0.93</td>
<td>0.90</td>
<td>χ²(137)=208.8</td>
</tr>
<tr>
<td>M₄</td>
<td>0.043</td>
<td>(0.030 ; 0.054)</td>
<td>0.066</td>
<td>0.066</td>
<td>0.93</td>
<td>0.90</td>
<td>χ²(135)=207.37</td>
</tr>
<tr>
<td>Comparing M₀ to M₁</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Δχ²(32)=1402.43, ρ &lt; 0.05</td>
</tr>
<tr>
<td>Comparing M₁ to M₂</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Δχ²(1)=5.2, ρ &lt; 0.05</td>
</tr>
<tr>
<td>Comparing M₂ to M₃</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Δχ²(1)=3.58, ρ &gt; 0.05</td>
</tr>
<tr>
<td>Comparing M₃ to M₄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Δχ²(1)=0.77, ρ &gt; 0.05</td>
</tr>
<tr>
<td>Comparing M₄ to M₅</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Δχ²(1)=0.66, ρ &gt; 0.05</td>
</tr>
</tbody>
</table>
As shown in Table 15, when comparing model 1 to the null model, there is a significant drop in the value of the chi-square, which indicates that model 1 is significantly better than the null model.

When comparing model 2 with model 1, there is a significant drop in the value of the chi-square, indicating that model 2 is a better model than model 1.

When comparing model 3 to model 2, there is a non-significant drop in the chi-square values, indicating that the less parsimonious model 3 is not a significantly better model than the more parsimonious model 2.

When comparing model 4 to model 3 and model 5 to model 4, the decreases in the values of the chi-squares are also non-significant.

In sum, based on the significant drop in chi-square values and the evaluation of fit measures, model 2 is the most parsimonious model for the data. In that sense it will be called from now on the better fitting model.

**Model comparison by gender**

To answer the third question whether the better-fitting model (M_2) is a well-fitted model for the subgroups of female or male adolescents, LISREL 8.5 will be used separately for females and males.
Based on the within-group completely standardized solution (shown in Figure 11), the results of the model evaluation for the female adolescents showed that SES at time 1 significantly influences academic achievement at time 2 positively ($\beta = .28$). Nurturant parenting significantly influences punitive parenting negatively ($\beta = -0.53$). Female adolescents’ academic achievement at time 2 significantly influences adolescents’ self-
esteem at time 3 positively ($\beta = 0.27$). A chi-square value of 196.06 with 138 degrees of freedom ($p = 0.0078$), a RMSEA value of 0.048, a SRMR value of 0.081, a GFI value of 0.88 and an AGFI value of 0.84 indicated that the model is not a well fitting model for female adolescents because the values of GFI and AGFI are less than 0.90. Only 8% of the variance in female adolescents' self-esteem at time 3 is explained by SES at time 1, nurturant parenting at time 2, punitive parenting at time 2, and academic achievement at time 2.

Based on the within-group completely standardized solution (shown in Figure 12), the results of the model evaluation for the male adolescents showed that SES at time 1 significantly influences nurturant parenting at time 2 positively ($\beta = 0.45$). Nurturant parenting significantly influences punitive parenting negatively ($\beta = -0.51$). Male adolescents' academic achievement at time 2 significantly influences their self-esteem at time 3 positively ($\beta = 0.44$). A chi-square value of 162.70 with 138 degrees of freedom ($p = 0.074$), a RMSEA value of 0.028, a SRMR value of 0.080, a GFI value of 0.89 and an AGFI value of 0.85 indicated that the model is not a well-fitted model for male adolescents because the values of GFI and AGFI are less than 0.90. In addition, 20% of the variance in male adolescents' self-esteem at time 3 is explained by socioeconomic status at time 1, nurturant parenting, punitive parenting, and academic achievement at time 2.
Figure 12. A model (M2) of the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and self-esteem for male adolescents.
Multigroup comparisons by gender

To answer the fourth question whether or not the coefficients are invariant across females and males, LISREL 8.5 was used to run a multigroup model comparison for the 147 females and 135 males.

The global goodness of fit statistics, with a RMSEA value of 0.039 and a highly significant chi-square value of 358.76 with 276 degrees of freedom \((p = 0.00058)\), indicated that the structural coefficients are not invariant, meaning some or all of the structural coefficients for the females are significantly different from those for the males. Female group goodness of fit statistics, with a RMR value of 0.081, a SRMR value of 0.081, and a GFI value of 0.88, indicated that the model is not a well-fitted model for female adolescents. Male group goodness of fit statistics, with a RMR value of 0.08, a SRMR value of 0.08 and a GFI value of 0.89, indicated that the model is not a well-fitting model for male adolescents.

Model comparisons by grade

Based on the within-group completely standardized solutions (shown in Figure 13), the results of the M2 for 134 6th-grade adolescents showed that nurturant parenting significantly influences punitive parenting negatively \((\beta = -0.47)\). Sixth-grade adolescents’ academic achievement at time 2 significantly influences their self-esteem at time 3 positively \((\beta = 0.41)\). A chi-square value of 198.94 with 138 degrees of freedom \((p = 0.00053)\), a RMSEA value of 0.047, a SRMR value of 0.082, a GFI value of 0.88 and an AGFI value of 0.83 indicated that model 2 is not a well fitting model for 6th-grade adolescents because the values of GFI and AGFI are less than 0.90. In addition, 17% of the variance in 6th-grade adolescents’ self-esteem at time 3 is explained by SES at time 1, nurturant parenting, punitive parenting, and academic achievement at time 2.
Figure 13. A model (M2) of the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and self-esteem for 6th-grade adolescents.
Based on the within-group completely standardized solutions (shown in Figure 14), the results of the M2 for 148 8th-grade adolescents showed that SES at time 1 significantly influences nurturant parenting at time 2 positively ($\beta = 0.35$). Nurturant parenting significantly influences punitive parenting negatively ($\beta = -0.67$). Eighth-grade adolescents’ academic achievement at time 2 significantly influences their self-esteem at time 3 positively.
(\beta = 0.27). A chi-square value of 169.14 with 138 degrees of freedom ($p = 0.037$), a RMSEA value of 0.037, a SRMR value of 0.080, a GFI value of 0.89, and an AGFI value of 0.85 indicated that M2 is not a well-fitted model for 8th-grade adolescents because the values of GFI and AGFI are less than 0.90. Only 7% of the variance in 8th-grade adolescents' self-esteem at time 3 is explained by SES at time 1, nurturant parenting, punitive parenting, and academic achievement at time 2.

**Multigroup comparisons by grade**

To answer the sixth question whether or not the coefficients are invariant across the 6th-and 8th-grade adolescents, LISREL 8.5 was used to run the multigroup comparison model.

The global goodness of fit statistics, with a RMSEA value of 0.042 and a highly significant chi-square value of 368.08 with 276 degrees of freedom ($p = 0.00017$), indicated that the structural coefficients are not invariant, meaning some or all of the structural coefficients for sixth graders are significantly different from those for eighth graders. Sixth grade group goodness of fit statistics, with a RMR value of 0.082, a SRMR value of 0.082, and a GFI value of 0.88, indicated that the model is not a well-fitted model for sixth grade adolescents. Eighth grade group goodness of fit statistics, with a RMR value of 0.08, a SRMR value of 0.08 and a GFI value of 0.89, indicated that the model is not a well-fitted model for eighth grade adolescents.
CHAPTER 5. DISCUSSION AND CONCLUSION

The purpose of this longitudinal study was to investigate a structural equation model of how SES, parenting, adolescents’ academic achievement, and adolescents’ self-esteem might be causally related, and to investigate if and how the relationships between the various constructs might be different for males and females or for sixth grade and eighth grade adolescents. Another purpose was to examine the unique contribution of each indicator of SES to parenting, adolescents’ academic achievement, and adolescents’ self-esteem as reported by both parents and the adolescents themselves.

Based on previous studies, several hypotheses were formulated and they will now be discussed in light of the results of the data analyses.

The Unique Contribution of Each Indicator of SES

It was hypothesized that each SES indicator would make an unique contribution to nurturant parenting, punitive parenting, adolescents’ academic achievement, and adolescents’ self-esteem.

The results of the multiple regression analyses showed that fathers’ level of education significantly predicted adolescents’ academic achievement as perceived by the fathers. The multiple regression results also showed that both maternal and paternal levels of education significantly predicted adolescents’ academic achievement as perceived by the mothers. These results are consistent with the finding by Considine and Zappala (2002) in their study that parental education significantly predicted academic achievement.

Parents with higher education may be more able to give academic guidance to their adolescent children on how to be successful at school. It is also possible that parents with higher education are more likely to be intelligent and to have intelligent children who are
able to succeed at school. There are other possible factors. Parents with higher education may be practicing more child rearing practices such as monitoring of school work, emphasizing the importance of education, participating in school activities and other behaviors that can result in academically and psychologically competent children.

Some studies (DeGarmo et al., 1999; Greenberger & O’Neil, 1991; Kohn & Schooler 1983; Menaghan & Parcel, 1991) have found that occupation is related to parenting. However, this study did not find any significant relationship between paternal and maternal occupational prestige scores or total family income and parenting, adolescents’ academic achievement, and adolescents’ self-esteem. Overall, there is no strong evidence in this study for the unique contribution of each indicator of SES to the variance in nurturant parenting, punitive parenting, academic achievement and self-esteem.

**Direct Effects of SES**

SES was hypothesized to have a direct and positive effect on nurturant parenting, on adolescents’ academic performance, and a negative direct effect on punitive parenting.

For all subjects, the results of the evaluation of structural equation model 2 indicated that SES at time 1 had a significant positive effect on nurturant parenting at time 2, but not on punitive parenting at time 2. However, the significant direct effects of SES were different for female, male, sixth, and eighth grade adolescents. Based on the evaluation of multigroup model comparisons for model 2, for female adolescents, the results showed a direct and significant positive effect of SES on academic achievement at time 2, but not on nurturant parenting at time 2 or punitive parenting at time 2. For male adolescents, the results of multigroup comparisons showed a direct and significantly positive effect of SES on nurturant parenting at time 2, but not on punitive parenting at time 2 or academic achievement at time
2. So the direct effect of SES on academic achievement was significant for female adolescents, but not for male adolescents and the direct effect of SES on nurturant parenting was significant for male adolescents, but not for female adolescents. For sixth grade adolescents, no significant direct effects of SES on nurturant parenting, punitive parenting, and academic achievement were found. For eighth grade adolescents, SES at time 1 significantly influences nurturant parenting at time 2 positively.

The findings for all subjects and for the female adolescent subgroup are consistent with other studies (Conger, Conger, & Elder, 1997; Hall, Kurtz-Costes, & Mahoney, 1997). SES in this study was found to have a significantly positive effect on adolescents’ academic achievement. Parental education, occupation, and income are positively correlated with each other. Higher-SES families may have more financial and physical resources to help their children be successful at school; parents in higher-SES families may also be more likely to encourage self-direction in their children and to provide an intellectually and cognitively stimulating environment for their children. Children from affluent families are more likely to have higher standardized achievement tests and go to high school and college (Hall, Kurtz-Costes, & Mahoney, 1997). Evidence showed that economic hardships affect 7th-grade adolescents’ school performance negatively (Conger, Conger, & Elder, 1997).

**Direct Effects of Nurturant Parenting**

Another prediction in the current study was that nurturant parenting would have a direct and positive effect on adolescents’ academic performance and punitive parenting.

For all subjects, the evaluation of the most parsimonious model (M2) indicated that nurturant parenting at time 2 had a significant and negative effect on punitive parenting at time 2 and a significant and positive effect on academic achievement at time 2. When the
multigroup model comparisons were examined, the significant effect of nurturant parenting on academic achievement had disappeared. Based on the evaluation of multigroup model comparisons for model 2, for female and male adolescents, the results showed that nurturant parenting influences punitive parenting significantly and negatively, but nurturant parenting does not influence academic achievement at time 2 significantly. The direct and negative effect of nurturant parenting on punitive parenting for female adolescents is just slightly larger than that for male adolescents. For sixth and eighth grade adolescents, nurturant parenting significantly influences punitive parenting significantly and negatively, but it does not influence academic achievement at time 2 significantly. The direct and negative effect of nurturant parenting on punitive parenting for eighth grade adolescents is larger than that for sixth grade adolescents.

Several researchers (Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Dornbusch, et al., 1991; Fan & Chen, 2001; Hall, Kurtz-Costes, & Mahoney, 1997; Patterson & Yoerger, 1991; Russell & Elder, 1997; Ryan & Powelson, 1991; Seginer, 1985; Stevenson & Baker, 1987; Wiest, Wong, & Kreil, 1998) have found a positive relationship between parental involvement, parental styles, parental beliefs, parent-adolescent communication, parental responsiveness, parental supervision, parental acceptance, and autonomy granting by parents and academic achievement. The finding in this study of a significant and positive effect of nurturant parenting at time 2 on adolescents’ academic achievement at time 2 is consistent with the findings of these other studies of positive correlations between parenting and adolescents’ academic achievement.

**Direct Effects of Punitive Parenting**

Punitive parenting was predicted to have a significant and direct and negative effect
on adolescents’ academic achievement.

However, for all subjects, the model evaluation for model 2 did not find that punitive parenting at time 2 had a significant and direct and negative effect on academic achievement at time 2. The same result also applied to the multigroup model comparisons. Based on the evaluation of multigroup model comparisons for model 2, for female and male as well as for sixth and eighth grade adolescents, the results did not show any significant effect of punitive parenting at time 2 on academic achievement at time 2.

Direct Effects of Academic Achievement

Adolescents’ academic performance was predicted to have a significant and direct and positive effect on adolescents’ self-esteem.

The evaluation of model (M2) indicated that adolescents’ academic achievement at time 2 directly and significantly influenced adolescents’ self-esteem at time 3 positively. The significant effects also applied to the four subgroups. Based on the evaluation of multigroup model comparisons for model 2, for female adolescents, the results showed that academic achievement at time 2 significantly influences adolescents’ self-esteem at time 3 positively. For male adolescents, the results showed that male adolescents’ academic achievement at time 2 significantly influences their self-esteem at time 3 positively. The effect of males’ academic achievement on self-esteem is stronger than the effect of females’ academic achievement on their own self-esteem. For sixth and eighth grade adolescents, academic achievement at time 2 influences their self-esteem at time 3 positively. The effect of academic achievement at time 2 on self-esteem at time 3 is stronger for sixth grade adolescents than for eighth grade adolescents.

The finding in this study of a significant relationship between academic achievement
and self-esteem is consistent with those of other studies, showing positive associations
between academic achievement and self-esteem (Bachman & O’Malley, 1986; Clasyn &
longitudinal study, also found that tenth graders’ academic achievement (as measured by
school grades) predicted their own self-esteem in twelfth grade.

**Parenting as a Mediator between SES and Academic Achievement**

It was further hypothesized that nurturant and punitive parenting would act as
mediators in the relationship between SES and adolescents’ academic achievement.

For all subjects, the evaluation of model (M2) indicated that nurturant parenting at
time 2 acted as a mediator between SES at time 1 and adolescents’ academic achievement at
time 2. However, no evidence was found that punitive parenting at time 2 acted as a mediator
between SES at time 1 and adolescents’ academic achievement at time 2. In contrast to the
findings across all subjects, for female adolescents, male adolescents, sixth graders, and
eighth graders, the results showed that both nurturant parenting and punitive parenting did
not act as mediators between SES and academic achievement.

The finding for model 2 across all subjects is consistent with the findings of previous
studies (DeGarmo, Forgatch, & Martinez, 1999) and in support of Beyer’s (1995) assumption
that parenting styles mediate the relationship between maternal employment and children’s
academic achievement. In DeGarmo, Forgatch, and Martinez’s (1999) study of young boys
aged 6-9 from divorced families, parenting mediated the relationship between maternal SES
(income, maternal education, and occupation) and school achievement. No other studies on
the mediator role of punitive parenting in the relationships between SES and academic
achievement were found in the literature search.
Academic Achievement as a Mediator between SES and Self-Esteem

It was further hypothesized that adolescents’ academic achievement would act as a mediator in the relationship between SES and adolescents’ self-esteem.

For all subjects, the evaluation of model 2 indicated that adolescents’ academic achievement at time 2 acted as a mediator between SES at time 1 and adolescents’ self-esteem at time 3. The same significant results applied only to the female subgroup. Based on the evaluation of multigroup model comparisons for model 2, for female adolescents, but not for male, sixth grade and eighth grade adolescents, the results showed that academic achievement acts as a mediator between SES and self-esteem.

The findings across all subjects and for female adolescents are consistent with the findings of the study by Muijs (1997), in which parental SES affected academic achievement, which led to self-esteem. Savin-Williams and Demo’s (1983) study of 118 fifth and sixth graders found no significant relationships between social class and self-esteem and between academic achievement and self-esteem. The differences in the findings between their cross-sectional study and this three-year longitudinal study may be due to different measurements of social class (father’s occupational status versus a composite measures of family income, paternal and maternal levels of education, paternal and maternal occupational prestige scores), academic achievement (the Iowa Test of Basic Skills versus a composite measurements of paternal, maternal, and adolescents’ perceptions of academic achievement), and self-esteem (the Coopersmith Self-Esteem Inventory versus the Rosenberg Self-Esteem Scale).

Academic Achievement as a Mediator between Parenting and Self-Esteem

Adolescents’ academic achievement was predicted to act as a mediator in the
relationships between both nurturant or punitive parenting and adolescents' self-esteem.

For all subjects, the evaluation of model 2 indicated that adolescents' academic achievement at time 2 acted as a mediator between nurturant parenting at time 2 and adolescents' self-esteem at time 3. However, adolescents' academic achievement did not act as a mediator between punitive parenting at time 2 and adolescents' self-esteem at time 3. The significant mediating relationships did not apply to the four subgroups. Based on the evaluation of multigroup model comparisons for model 2, for female and male adolescents as well as for sixth and eighth grade adolescents, the results showed that academic achievement did not act as a mediator between nurturant parenting and self-esteem, nor between punitive parenting and self-esteem. The differences between the model for all subjects and the model across the four subgroups might be attributed to statistical power. More subjects for data analyses increases statistical power, which makes it more likely to find significant relationships among variables (or among constructs).

Ample evidence has showed direct positive effects of parenting on academic achievement (Dornbusch, Ritter, Leiderman, Roberts, & Fraligh, 1987; Dornbusch et al., 1991; Fan & Chen, 2001; Glasgow, Dornbusch, Troyer, Steinberg, & Ritter, 1997; Halle, Kurtz-Costes, & Mahoney, 1997; Patterson & Yoerger, 1991; Russell & Elder, 1997; Ryan & Powelson, 1991; Seginer, 1985; Stevenson & Baker, 1987; Wiest, Wong, & Kreil, 1998). Some studies (Bachman & O’Malley, 1986; Bean, Bush, McKenry, & Wilson, 2003; Calsyn & Kenny, 1977; Lockett & Harrell, 2003; Tremblay, Inman, & Willms, 2000) showed some evidence of positive relationships between academic achievement and self-esteem. Most of these studies are cross-sectional and correlational in nature. Very few studies have a longitudinal design to examine whether or not academic achievement acts as a mediator
between parenting and self-esteem.

**Gender Effects**

It was hypothesized that gender would be a moderator variable in the relationships among SES, nurturant parenting, punitive parenting, adolescents’ academic achievement, and adolescents’ self-esteem. This hypothesis implies that the relationships among the latter variables for the female adolescents would be different from the relationship among these variables for the male adolescents.

First, the MANOVA results showed that there is a gender effect for academic achievement as assessed by the fathers and the mothers. Both mothers and fathers of adolescent daughters gave ratings of their daughters’ academic achievement that were higher than the ratings given by mothers and fathers of the academic achievement of their adolescent sons. These results are consistent with those of previous studies (Brooks & Mercincavage, 1991; Freeman, 2003; Han, 1993; Lindgram et al., 1986; Schram, 1996). In general, female adolescents’ academic achievement as perceived by both parents is higher than that of male adolescents.

Second, the results of the structural equation model analyses showed that the models are not invariant across female adolescents and male adolescents. The relationships among the latent constructs are different for female than for male adolescents. Two mediating relationships were found: one for the female subgroup and the other for the male subgroup.

The first mediating relationship is that female adolescents’ academic achievement acted as a mediator variable in the relationship between SES and self-esteem. However, male adolescents’ academic achievement did not act as a mediator variable in the relationships between SES and self-esteem. Female adolescents from higher-SES families are more likely
to have better academic achievement, which leads to higher levels of self-esteem.

The second mediating relationship is that nurturant parenting acted as a mediator variable in the relationships between SES and punitive parenting for male adolescents. Parents from higher-SES families are less likely to use punishment towards their adolescent sons and the effect of SES is an indirect effect with parental nurturance as the linking variable.

The significant direct effect of SES on nurturant parenting was found for male adolescents, but not for female adolescents. Parents with higher social status are likely to be more nurturing toward their adolescent sons. On the other hand, the significant direct effect of SES on academic achievement was found for female adolescents, but not for male adolescents. Female adolescents from higher social status families are more likely to perform better at school. The results of the structural equation model analyses for both female and male adolescents showed a significantly negative effect of nurturant parenting on punitive parenting. Nurturant parents are less likely to use punishment toward their adolescent children.

**Grade Effects**

It was also investigated whether grade also acted as a moderator variable in the relationships among SES, nurturant parenting, punitive parenting, adolescents' academic achievement, and adolescents' self-esteem. This hypothesis implies that the relationships among the latter constructs for sixth grade adolescents would be different from the relationships among these constructs for eighth grade adolescents.

First, the MANOVA results showed that fathers of 6th-grade adolescents have higher scores on punitive parenting as perceived by the fathers than fathers of 8th-grade adolescents.
In addition, mothers of 6th-grade adolescents also have higher punitive parenting scores as perceived by the mothers than mothers of 8th-graders.

Second, based on the results of the structural equation model analyses, the models are not invariant across sixth and eighth grade adolescents. One mediating relationship found for eighth grade adolescents is that nurturant parenting mediated the relationships between SES and punitive parenting. Both models for the sixth and eighth grade adolescents showed a significantly direct and positive effect of adolescents’ academic achievement on their self-esteem and a significantly direct and negative effect of nurturant parenting on punitive parenting. The higher the adolescents’ academic achievement is, the higher their self-esteem is. Nurturant parents are less likely to use punishment toward their sixth and eighth grade adolescent children.

**Limitation of the Research**

This study used data from a three-year longitudinal study conducted in Iowa in 1989, 1990, and 1991 on a group of sixth and eighth graders and their parents. There may be at least three limitations to the study. First, the findings for the sixth and eighth graders in this study might not be applicable to other grades. Second, the sample includes only white families. The result may not be able to generalize to other populations (Asians, Africans, African-Americans, or Asian-Americans). Third, the effect of social interaction in intact families may be very different from those in divorced or single-parent families. For example, parental nurturing has been found to be positively correlated with adolescents’ academic achievement for intact families; however, parental supervision or involvement may be found to be strongly positively correlated with academic achievement for adolescents in single or divorced families. The results of this study may not be applicable to other family structures.
Implications

Based on model 2 for all subjects, SES significantly influences nurturant parenting and adolescents’ academic achievement positively; nurturant parenting significantly influences punitive parenting negatively and academic achievement positively. Four mediating relationships were found across all subjects. Nurturant parenting acted as a mediator between SES and adolescents’ academic achievement and between SES and punitive parenting. Adolescents’ academic achievement acted as a mediator between SES and their own self-esteem and between nurturant parenting and their own self-esteem.

The same significant effects of nurturant parenting on punitive parenting and academic achievement on self-esteem across all subjects also applied to female and male adolescents as well as to sixth and eighth grade adolescents. The significant effect of SES on nurturant parenting across all subjects applied to male adolescents and eighth grade adolescents, but not to female adolescents and sixth grade adolescents. The significant effect of SES on academic achievement across all subjects was found for female adolescents, but not for male adolescents, or sixth and eighth grade adolescents. The significant effect of nurturant parenting on academic achievement across all subjects was not found across the four subgroups. The differences in significant paths across all subjects and across the four subgroups may result from differences in statistical power. That is, a larger number of subjects increases statistical power; a smaller number of subjects decreases statistical power. Therefore, significant relationships among constructs are more likely to be found for all subjects, but not for each subgroup.

By applying Bronfenbrenner’s PPCT model, this study examined the effects of parent-adolescent relationships (PROCESS) on academic achievement and self-esteem in
early- and middle-adolescence (PERSON) from different levels of social class (CONTEXT) (defined as a composite measure of family income, paternal and maternal education, and paternal and maternal occupational prestige) during three years of study (TIMES 1, 2 and 3).

The finding on the mediator role of academic achievement in the relationships between SES and self-esteem for female adolescents showed that female adolescents from higher social status families (as measured at time 1) are more likely to have better academic achievement (as measured at time 2), which, in turn, leads to higher levels of self-esteem (as measured at time 3). The finding can be interpreted as the effect of the exosystem (the organization of society in terms of varying levels of SES) on the developing persons’ academic achievement and self-esteem.

The finding showed that parents of male adolescents and eighth-grade adolescents from higher-SES families are more likely to be nurturing toward their adolescent children. The finding can be interpreted as the effect of exosystem (the organization of society in terms of varying levels of SES) on the microsystem (the parent-adolescent relationship) of the adolescents.

Furthermore, the evidence of non-invariant models for male and female adolescents showed that the model for female adolescents is different from the model for male adolescents. This finding may be interpreted as the effect of macrosystem (gender a proxy measurement of gender socialization in the society) on the microsystem (parent-adolescent relationships).

By applying the principle of the interdependence of lives from Elder’s life course theory, parental SES is hypothesized to have an impact on their child’s life. The finding on the mediating effect of nurturant parenting between SES and adolescents’ academic
achievement for all subjects showed that parents from higher social class families are more likely to be nurturant toward their adolescent children, which leads to better academic achievement in adolescent children. In addition, the finding for all subjects on the mediating role of adolescents’ academic achievement between SES and their own self-esteem and between nurturant parenting and their own self-esteem showed that adolescents from higher social class families are more likely to have parents who are more nurturing which leads to higher academic achievement, which, in turn, leads to higher self-esteem. However, the significant mediator role for academic achievement in the relationship between SES and self-esteem was found only for female adolescent subgroup, but not for male, sixth grade or eighth grade adolescents. The significant mediator role for nurturant parenting in the relationships between SES and academic achievement was not found in any subgroup.

Higher social class might mean better financial and social resources available to the family. Those parents who can provide a better financial and social environment may also be more likely to have good parenting skills. Therefore, the adolescents from advantaged families are likely to be more academically and psychologically competent than other adolescents from less advantaged families. Elder’s interdependence of lives notion might simply mean in the context of the present study that parents’ SES influences their parent-adolescent child relationship which affects adolescents’ academic achievement, which affects higher self-esteem.

The longitudinal data of the present study demonstrated that SES as indicated by family income, paternal and maternal education, and paternal and maternal occupational prestige, impacted nurturant parenting and adolescents’ academic achievement. The relationship between SES and academic achievement is also mediated by parenting. The
benefits of higher education and income, as well as of a prestigious occupation, not only influence parenting and academic achievement directly, but they also influence academic achievement indirectly. Parents from affluent families are less likely to be stressed between two or more jobs. They may also have more time available to spend with their children, and to have social and financial resources for creating an intellectually and cognitively stimulating environment for their teens.

The findings may have different meanings and implications for parents, educators, and policy makers. One of the main issues of parenting is determining how to provide an intellectually stimulating and safe environment for youth. It seems unwise to promote increased parental involvement without affective parenting and warmth (Veneziano & Rohner, 1998). Therefore, it is also important to learn how to actively involve the adolescents’ school with nurturant parenting (e.g. warmth and responsiveness). For educators, how to increase adolescents’ academic achievement and boost self-esteem is important. School counselors, teachers, and principals may also collaboratively design programs to encourage interaction between the family and the school as well as the whole community (Hall, Kurtz-Costes & Mahoney, 1997). For policy makers, reducing poverty may be one of the primary issues. In the long run, the government may offer parents free occupational training. In the short run, to reduce the severe impact of poverty, the government may establish more public libraries equipped with all up-to-date books, magazines, visual-and audio-stimulating toys or other learning materials in poor neighborhoods.

**Future Direction**

To improve academic achievement and self-esteem, one should not only focus on
parent-teen relationships, but also construct an integrated model to build a three-way communication between parents, schools and the community at large.

Developmentalists address developmental issues of adolescents; educators address school reform. Researchers examine how different social environment and social interaction processes affect many areas of development. For instance, parental supervision, monitoring, acceptance, warmth, demandingness, closeness, communication and involvement with school or at home should be examined. In addition, it is important to understand the impacts of different indicators of SES (e.g., income, education, occupation, occupational prestige scores, the neighborhood conditions, welfare recipients, the number of books and possession or cultural activities attended in a year) on a person’s life. Based on other studies (Leventhal & Brooks-Gunn, 2000; Wasserman et al., 1998), the community-level SES is associated with achievement and behavioral outcomes when individuals’ income and education are controlled. Therefore, it is important to study the effects of neighborhood SES on developmental outcomes. Future research should focus on studying the relationships among SES, parenting, academic achievement and self-esteem in different families, cultural and ethnic groups.
REFERENCES


APPENDIX 1: PARENTAL EDUCATION CODING

______ Years if less than 8th grade

09 = 9th grade
10 = 10th grade
11 = 11th grade
12 = High school graduate (GED or equivalent)
13 = 1 year college, vocational or technical school
14 = 2 year college, vocational or technical school
15 = 3 year college, vocational or technical school
16 = Bachelor’s degree
17 = Some graduate work
18 = Master’s degree or equivalent
19 = Ph.D., M.D., J.D., D. D. S. or equivalent
APPENDIX 2: PARENTAL OCCUPATIONAL CODING

For each mother and father, the current occupational categories were coded into mean prestige scores as follows.

<table>
<thead>
<tr>
<th>Occupation coding in the current dataset</th>
<th>Mean prestige score</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 = Professional or technical (such as lab technician, teacher, accountant, engineer, doctor, lawyer)</td>
<td>62.33</td>
</tr>
<tr>
<td>02 = Administrative, manager, or owner (such as manager or owner of a business, school administrator, inspector)</td>
<td>62.33</td>
</tr>
<tr>
<td>03 = Farm operator</td>
<td>35.63</td>
</tr>
<tr>
<td>04 = Foreman or supervisor</td>
<td>40.44</td>
</tr>
<tr>
<td>05 = Skilled craftsman (such as plumber, locomotive engineer, baker, carpenter, electrician, jeweler)</td>
<td>35.57</td>
</tr>
<tr>
<td>06 = Clerical or sales (such as dispatcher, postal clerk, insurance salesman, retail or wholesale salesperson, real estate agent)</td>
<td>40.44</td>
</tr>
<tr>
<td>07 = Operative (such as assembler, tailor, meat cutter, welder, truck driver, fork lift operator)</td>
<td>38.54</td>
</tr>
<tr>
<td>08 = Farm laborer</td>
<td>35.63</td>
</tr>
<tr>
<td>09 = Nonfarm laborer</td>
<td>33.41</td>
</tr>
<tr>
<td>10 = Service worker (such as janitor, childcare worker, waiter, cook, fireman, sheriff, barber)</td>
<td>35.57</td>
</tr>
<tr>
<td>11 = Disabled entire adult life</td>
<td>0.00</td>
</tr>
<tr>
<td>12 = Unemployed entire adult life</td>
<td>0.00</td>
</tr>
<tr>
<td>13 = Homemaker</td>
<td>0.00</td>
</tr>
<tr>
<td>14 = Farm wife (assist with farm work)</td>
<td>35.63</td>
</tr>
<tr>
<td>15 = Full-time student</td>
<td>0.00</td>
</tr>
<tr>
<td>16 = Full-time farmer and other full-time job</td>
<td>35.63</td>
</tr>
<tr>
<td>00 = Not working or not looking for work</td>
<td>0.00</td>
</tr>
</tbody>
</table>
APPENDIX 3: PARENTING QUESTIONNAIRE

Now we'd like you to think about your parents and answer some questions about each of them.

Please read each of the following statements and use the choice that best describes the way your mother (father), in general, has acted toward you during the last year. In rating the statements, use the following choices:

1 = Never
2 = Seldom
3 = Sometimes
4 = Often
5 = Very often

1. Let you know you were appreciated, loved, and respected?
2. Say nice things to you?
3. Enforce a rule or not enforce a rule depending upon her mood?
4. Want to know exactly where you were and what you were doing?
5. Make her whole like center around you?
6. Threaten punishment more often than she used it?
7. Nag you about little things?
8. Feel proud of the things you did?
9. Scold you for disobeying or misbehaving?
10. Provide supervision and check up on you?
11. Take an interest in where you were going and who you were with?
12. Listen to your ideas and opinions?
13. Get angry and yell at you?
14. Punish you by grounding you or sending you to your room?
15. Punish you physically (spank, slap, etc.)
16. Tell others about the good things you did?
17. Tell you what time to be home when you went out?
18. Show interest in what you were learning at school?
19. Give you a lot of care and attention?
20. Only keep rules when she wants to?
21. Punish you for doing something one day, but on a different day not punish you for the same thing?
APPENDIX 4: THE ROSENBERG SELF-ESTEEM SCALE

This set of questions is about you. We’d like to know how you feel about yourself.

Read each statement and circle the number that tells how much you agree or disagree with how it describes you. Your choices are:

1 = strongly disagree
2 = disagree
3 = agree
4 = strongly agree

1. On the whole, I am satisfied with myself.
2. At times I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I am a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.
9. All in all, I am inclined to feel that I am a failure.
10. I take a positive attitude toward myself.