SHYNESS, SOCIAL ACCEPTANCE, AND SELF-ESTEEM IN EARLY ADOLESCENCE: INTERRELATIONSHIPS AND THE ROLE OF PARENTS' PROBLEM SOLVING

by

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(Under the direction of Gene Brody)

ABSTRACT

Learning to be successful in social interactions is one of the hallmarks of late childhood and early adolescence. Children who lack social initiative may be hesitant to engage in the social practice necessary to become socially skilled and successfully integrated into social networks. Lack of social integration may be manifested as poor social acceptance for these youth who tend toward shy behavior. Poor social acceptance, furthermore, may lead to decreases in self-esteem as the importance of social integration increases in developmental importance. Data from the Adolescent Development Research Program (ADRP) at the University of Georgia were used to assess the relationships among shyness, social acceptance, and self-esteem during the transition to adolescence. Three waves of data were collected from adolescents aged 11 to 15 years, their parents, and a favorite teacher between April 1994 and December 1997. Structural equation modeling via LISREL 8.54 (Joreskog & Sorbom, 2003) was used to test the relationship of shyness to both social acceptance and self-esteem and to also test social acceptance as a possible mediator of the relationship between shyness and self-esteem three years later. Also, the moderating influence of parents' positive problem solving on the relationship of shyness to both social acceptance and self-esteem was assessed using two-group analyses involving high and low problem-solving groups. Shyness showed a negative association with social acceptance one year later and accounted for a residual decline in self-esteem over the last two waves of the study. Social acceptance, however, was not supported as a mediator of the relationship between shyness and self-esteem, but showed a trend toward moderating this relationship. Parents' positive problem solving did not moderate the relationship of shyness to self-esteem. Youth with high problem-solving fathers *and* mothers, however, showed a significant negative association between shyness and self-esteem three years later when self-esteem at time 2 was included as a predictor. Results suggest the importance of encouraging social exploration in late childhood and early adolescence and the possible dangers of excessive parental involvement during these years.

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My father completed his Ph.D. in 1966, the year after I was born. I am the last of five children, and my mother had her hands full with all of us. Over my last four years at University of Georgia, my father's perseverance in completing his Ph.D. has served as an example and inspiration to me. I do not know if I would have had the strength and discipline to reach this point, however, without the additional support of my wife, Carlin. She entered my life in 1997 and has never let me settle for mediocrity in my professional development. She, like my father, inspired me through her example and constant encouragement. My mother, furthermore, has never doubted my potential, even at the point when I had quit two other graduate programs. All of these individuals share in this accomplishment.

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CHAPTER 1

INTRODUCTION

The late childhood and preadolescent years are a time in which elevated self-consciousness and preoccupation with social status are increasingly normative (Harter, 1999). As early as age 8, for example, children can identify themselves as either popular or unpopular and can evaluate their global self-worth due to their emerging ability to reflect upon other's evaluations of them. (Harter, 1999). Furthermore, the onset of puberty brings an acutely new awareness of one's physical appearance, and also the ability to take both one's own perspective and the perspectives of others into account (Bruch, 1989; Harter, 1999). Therefore, others' positive or negative evaluations become an increasingly salient component of self-appraisals as children approach adolescence.

The ability of preadolescents to evaluate their self-worth has important ramifications for other areas of their functioning (Gurney, 1987; Delugach, Bracken, Bracken, & Schicke, 1992; Zimmerman, Copeland, Shope, & Dielman, 1997; McWhirter, Besett-Alesch, Horibata, & Gat, 2002). Gurney (1987) found a positive association between self-esteem and academic achievement in students aged 10 to 12 years, as did Zimmerman and colleagues (1997) in a cluster analysis of students in grades 6 to 10. In Zimmerman et al. (1997), students in a cluster described as "steadily decreasing self-esteem" also showed elevated levels of alcohol abuse and susceptibility to peer pressure, whereas those with consistently high or increasing self-esteem showed the opposite trend in these areas. Additionally, in a study of students in grades 5 and 6,

Delugach and colleagues (1992) found self-esteem to be associated with more positive interpersonal relationships. McWhirter and colleagues (2002), in a slightly older sample (M = 17 years), found low self-esteem to predict high levels of loneliness. Therefore, self-esteem appears to have important implications in multiple domains.

Conceptualizing Self-Esteem

William James (1890) conceptualized the self as consisting of three parts: the material self, the spiritual self, and the social self. He further postulated that the social self is based primarily on one's relationships with significant individuals and social groups. Later writers also saw one's relationships with significant others as significant influences upon one's self-perceptions (Cooley, 1902; Mead, 1934; Sullivan, 1953). Cooley conceptualized a looking-glass self framework in which relationships with significant others serve as a mirror through which one may construct a view of the self. Therefore, according to Cooley, one's self-worth is primarily the result of what one perceives to be the evaluations of significant others. Mead (1934) affirmed the link between social relationships and self-esteem, postulating that interpersonal relationships in later childhood require one to internalize the perceptions of all other social participants toward him or her. Sullivan (1953), furthermore, asserted that positive interpersonal relationships with both parents and peers are a primary avenue through which one's global self-worth is affirmed and validated.

Empirical findings from more recent researchers (e.g. Harter, 1998) suggest that interpersonal relationships within specific contexts may be the best predictor of self-esteem within those contexts, therefore challenging traditional views of self-concept as a unitary construct. Harter (1998), for example, found females who are socially accepted

and supported by their female peers to be most likely to report their highest level of relational self-esteem within the female-peer context. This finding suggests social acceptance by one's peers as especially important in encouraging self-esteem. However, Harter (1998) has also found modest correlations between social acceptance in one context and relational self-esteem in other contexts, thereby suggesting that social acceptance at multiple ecological levels may be important in encouraging greater self-esteem.

The importance of positive social relationships in the development of self-esteem is perhaps best articulated by Leary's (1995) self-presentation theory and sociometer hypothesis. In his self-presentation theory, Leary proposed the existence of a private self and a public self, the former consisting of personal values, thoughts and feelings, and the latter consisting of one's perceptions of how others are evaluating them (Leary, 1995). According to Leary, a warning system, which he has labeled a sociometer, within the public self alerts the individual to decreases in social acceptance that might jeopardize ties with the peer group and, consequently, one's global self-worth (Leary, Tambor, Terdal, & Downs, 1995). Therefore, changes in self-esteem are inextricably tied to one's social behavior in relationship to others via the sociometer's sensitivity to changes in social acceptance.

Correlates of Predolescent and Adolescent Self-Esteem

Peer orientation and the concomitant importance of social acceptance reach their peak during the preadolescent and adolescent years (Eccles, Lord, & Midgely, 1991). As suggested by Leary's (1995) sociometer hypothesis, fluctuations in social acceptance by peers during these years have important implications for the self-esteem of these youth

(e.g. Bullock, 1992; Dayan, Doyle, & Markiewicz, 2001). In addition, the child's temperament (e.g. Crozier, 1995; Lazarus, 1982) and parent-child relationships (e.g. Reiss, Neiderhiser, Hetherington, & Plomin, 2000; Roberts et al., 2000) may have a significant influence upon preadolescent and adolescent self-esteem.

Peers and self-esteem. Several studies of self-esteem have supported its roots in interpersonal relationships (Dayan et al., 2001; Bullock, 1992). In a sample of adolescents, social support from a best friend predicted higher self-esteem in those youth characterized as independent and self-reliant, but not in more reticent youth (Dayan et al., 2001). Furthermore, in another adolescent sample, the inability to establish positive friendships was associated with deficits in both social competence and self-esteem (Bullock, 1992). Fenzel (2000), although finding strained relationships with peers to be associated with diminished self-esteem, also found perceptions of one's social competence and social support from close friends to moderate this relationship such that competence and support predicted increased self-esteem.

Temperament and self-esteem. Another factor that has been associated with self-esteem in preadolescents and adolescents is temperament (e.g. Rubin, Hymel, & Mills, 1989; Crozier, 1995; Lazarus, 1982). Rubin and colleagues (1989) suggested that shyness may not engender any serious problems until after age 6. After this point in development, however, children who fail to develop positive relationships with peers may be at risk for both low levels of social acceptance (Hymel, Rubin, Rowden, & LeMare, 1990) and poor self-esteem (Rubin et al., 1989; Hymel et al., 1990). Shyness in grade 2, for example, has been found to predict negative social self-perceptions in grade 5, and also to be concurrently associated with negative social self-perceptions across grade levels (Rubin

& Mills, 1988, Hymel et al., 1990). Others (Lazarus, 1982; Crozier, 1995) have also found a significant negative association between shy temperament and self-esteem in young preadolescent children.

Socially anxious youth who exhibit shy behavior may also be at risk for poor social acceptance and self-esteem (Ginsberg, La Greca, & Silverman, 1998; Block & Robins, 1993). Social anxiety involves a "marked and persistent fear of social or performance situations in which embarrassment may occur" (Diagnostic and Statistical Manual of Mental Disorders, 4th ed., APA, 1994, p. 411). This fear response may cause noticeable discomfort, avoidance of specific social situations, and interference with daily functioning. This is highly consistent with Asendorpf's (1990) conceptualization of shyness, which combines a high desire to interact socially with a pronounced tendency to avoid social interactions due to fear of negative evaluation. Furthermore, Henderson (1997) has found a strong association between shyness and social anxiety.

As is the case with shyness, empirical studies support the negative association between social anxiety and self-esteem. Ginsberg and colleagues (1998) found that socially anxious children aged six to eleven reported low social acceptance, low self-esteem, and generally negative peer interactions. Furthermore, in a longitudinal sample, males who exhibited high social anxiety and females who avoided close relationships at age 14 were likely to exhibit below-average self-esteem nine years later (Block & Robins, 1993).

Parent-child relationships and self-esteem. Although temperament may be relatively stable across time, salient environmental factors, such as positive parental involvement, may effect behavioral change (Rutter, 1996). Parents who engage in

positive problem-solving behaviors with their shy and socially anxious children may encourage the development of greater self-esteem (Reiss & Neiderhiser, 2000; Henderson, Banerjee, Smith, & Buell, 2000). Henderson and colleagues, for example, found that socially anxious children aged eight to eleven, though not reporting any decrease in anxiety, were able to learn prosocial skills through interaction with competent adults (Henderson et al., 2000).

Positive parental involvement has also been found to encourage self-esteem in more general youth samples (e.g. Dekovic & Meeus, 1997; Deihl, Vicary, & Deike, 1997; Roberts et al., 2000). In a preadolescent sample, Roberts and colleagues (2000) found positive parental involvement to be positively associated with self-esteem, especially for those youth whose peers were supportive. Furthermore, Deihl et al. (1997) found positive family and peer relationships to be consistently related to both consistently high and increasing levels of self-esteem in students from sixth to tenth grade. Finally, maternal acceptance has been associated with both positive peer relations and high self-esteem in a sample ranging in age from 12 to 18 years (Dekovic & Meeus, 1997).

In sum, the history of the parent-child relationship establishes patterns and processes that are associated with both current and later child functioning (Rutter, 1989). Although physiological mechanisms may initiate a risk process, like that involved with shyness, other mechanisms, such as parent-child interaction, may either maintain the continuity of social withdrawal or change the course of its developmental trajectory (Rutter, 1996). Therefore, it is plausible that the pathway from shyness to social adjustment is moderated by positive parental involvement (Schmitz, Saudino, Plomin, Fulker, & DeFries, 1996). More specifically, parents who engage in effective problem-

solving behaviors with their shy children may encourage the development of prosocial behaviors that promote greater social acceptance with peers.

A Model of Shyness, Social Acceptance, and Self-Esteem

Existing studies suggest a typical developmental path for many shy children. As shy children enter middle childhood, the increasing importance of positive peer interactions appears to make shy children more acutely aware of their lack of social acceptance. Even as early as grades 2 to 5, shyness is able to predict decreases in both social acceptance and self-esteem (Hymel et al., 1990), and poor peer relations in grade five have been shown to predict decreases in self-esteem from grade 5 to grade 6 (Fenzel, 2000).

The extant literature, however, has not examined the precise ordering of this process. The evidence suggests that shy and socially anxious youth continue to suffer in their peer relationships well into adolescence (LaGreca & Lopez, 1998; Asendorpf & Wilpers, 1998), but it is less clear whether self-esteem necessarily declines in all shy children (Wachs, 1994; Kagan, 2001). Furthermore, although Ginsberg and colleagues (1998) found socially anxious children aged 6 to 11 to report low social acceptance, poor peer relations, and low self-esteem, it remains unclear whether low social acceptance is a necessary condition for negative self-perceptions and diminished self-esteem.

As the extant literature suggests, positive parental involvement is one avenue through which positive psychosocial outcomes may be encouraged in shy children over the adolescent transition. Reiss and colleagues (2000) found fathers' warmth and support to account for about a quarter of the variance in adolescent sociability, a construct typically associated with competent, prosocial behavior and positive peer interactions

(Rydell, Hagekull, & Bohlin, 1997). A need remains, however, for studies that examine the extent to which positive parental involvement moderates the tendency for shy children to experience diminished social acceptance over the adolescent transition. Multiple studies have found a significant positive association between positive parental involvement and social acceptance during the adolescent transition (e.g. Dekovic & Meeus, 1997; Roberts et al., 2000), but a clear need remains for studies that examine how positive parental involvement influences social acceptance in shy children making the transition to adolescence.

An additional issue yet to be resolved in the extant literature is the role of social acceptance in the relationship between shyness and self-esteem during the transition to adolescence. Several studies have reported a positive association between social acceptance and self-esteem during adolescence (Deihl et al., 1997; Roberts et al., 2000; Dubois et al., 2002). Dekovic and Meeus (1997), furthermore, found support for self-esteem as a mediator between parental acceptance and peer acceptance during adolescence, but only for mothers. Fenzel (2000) found a bi-directional influence of social acceptance and self-esteem with students in grades 5 and 6, but did not include shyness in his model. Therefore, although the preceding studies have provided much valuable information, an important question remains unanswered: What is the precise relationship between shyness, social acceptance, and self-esteem during this transitional period?

Purpose of the Present Study

The present study sought to answer four general questions.

1. Does shyness account for a decrease in social acceptance and self-esteem over the adolescent transition?
2. Does shyness lead to poor self-esteem only for youth who are not socially accepted?
3. To what extent does the relationship between shyness and social acceptance depend on the amount of successful problem solving parents do with children?
4. To what extent does the relationship between shyness and self-esteem depend on the amount of successful problem solving parents do with children?

In accordance with this fourfold purpose, the following hypotheses were proposed.

Hypotheses

1) Time 1 shyness will be negatively associated with time 2 social acceptance over the transition to adolescence and will account for a significant decrease in social acceptance from time 1 to time 2. Decreases in social acceptance will be evidenced by a statistically significant negative association between time 1 shyness and time 2 social acceptance after the predictive influence of time 1 social acceptance is taken into account.
2) Time 1 shyness will be negatively associated with time 3 self-esteem and will account for a significant decrease in self-esteem from time 2 to time 3. Decreases in self-esteem will be evidenced by a statistically significant

negative association between time 1 shyness and time 3 self-esteem after the predictive influence of time 2 self-esteem is taken into account.

3) Social acceptance will mediate the tendency for shyness to be associated with significantly diminished self-esteem over the transition to adolescence. Specifically, a significant proportion of the total effect of time 1 shyness on time 3 self-esteem will be accounted for by the indirect paths from shyness to social acceptance, and social acceptance to self-esteem.
4) The tendency for shyness to predict decreases in social acceptance and self-esteem will be moderated by parents' positive problem-solving such that high levels of problem-solving will be associated with increased social acceptance and self-esteem. Specifically, the predicted negative association between shyness and both social acceptance and self-esteem will reduce to statistical non-significance under the condition of high parental problem solving, but will remain statistically significant and negative under the condition of low parental problem solving.

CHAPTER 2

REVIEW OF LITERATURE

The review of literature first summarizes those studies that have examined the association of social acceptance with self-esteem during both preadolescence and adolescence. This is followed by a summary of studies that have examined the association of shyness with self-esteem during these years. Studies that have examined the association of shyness with social acceptance are also reviewed, as are studies that suggest social acceptance as a potential mediator of the link between shyness and self-esteem. This is followed by a review of those studies that have examined the influence of parental problem-solving on the link between shyness and social acceptance. The chapter concludes with a discussion of two theoretical frameworks, developmental systems theory and self-presentation theory, each of which serves as a foundation for the hypotheses to be tested.

Social Acceptance by Peers and Self-Esteem

Children in early and middle childhood develop an increasing ability to engage in social comparison and evaluate their global self-worth, both of which are closely tied to assessments of their social acceptance (Harter, 1999). As early as age 11, for example, positive social relationships have been associated with greater self-esteem (Delugach et al., 1992), and poor relationships with peers has been associated with low self-esteem in a middle school sample (Fenzel, 2000). Positive relationships with friends predicted greater self-esteem in the same middle school sample (Fenzel, 2000).

Adolescents who struggle with social acceptance have also been found to be at risk for low self-esteem. High school students who perceive themselves to be lonely have been found to be at greater risk for low self-esteem (McWhirter et al., 2002), and those who experience low levels of social acceptance have been found to have significantly more negative self-perceptions (Ginsburg et al., 1998). According to Bullock (1992), adolescents who reported few positive friendships were significantly more likely to report low self-esteem. Data from Ginsburg and associates (1998) suggests that children who experience low levels of social acceptance can become habitual targets of their peers' teasing and have difficulty establishing any close friendships.

Shyness and Self-Esteem

One particular group in which low levels of social acceptance may present an increased risk for low self-esteem is children with a shy temperament (Rubin & Krasnor, 1986). According to Rubin and Krasnor (1986), shyness may begin to engender negative psychosocial outcomes when children are between the ages of 8 and 10 years because mutual respect for peers' opinions and values becomes more important during this time. Strauss and colleagues (1986), for example, found 7- to 10-year-old children whose classmates had nominated them as socially withdrawn to have lower self-concepts than did outgoing students (Straus, Forehand, Smith, & Frame, 1986). Additionally, shyness at age 10 has been associated with low levels of social acceptance and global self-worth (Fordham & Stevenson-Hinde, 1999).

Shy children may continue to be at increased risk for poor self-esteem as they approach adolescence (Younger, Schneider, Wadeson, Guirguis, & Bergeron, 2000). In a sample ages 8 to 13, for example, shy children described as self-conscious-anxious had

self-perceptions that were significantly more negative than controls (Younger et al., 2000). This trend may continue in later years, as shyness has been found to negatively affect the quality of older adolescents' peer relationships (Asendorpf & Wilpers, 1998), and alienation from peers has been associated with low self-esteem (Henderson, 1997). Low levels of social interaction in early adolescence, for example, has been found to predict low self-esteem in early adulthood (Block & Robins, 1993).

Shyness, Social Acceptance, and Self-Esteem: A Mediational Link?

The previous studies suggest that the association between shyness and self-esteem is often linked to the low social acceptance often experienced by shy children and youth. At age 11, for example, shyness has been associated with both loneliness and low levels of peer acceptance (Rubin, 1993). During middle childhood, shyness may be associated with lower levels of peer acceptance because other children, perceiving shyness as a non-normative behavior, may develop more negative perceptions of shy children (Rubin & Krasnor, 1986; Rubin et al., 1989). According to Bowlby (1969), children in middle and later childhood are expected to build a working model of social interaction based on the accumulation of social experiences with peers. Children who are shy may lack the requisite social initiative to accumulate a sufficient history of social experiences and build adequate working models of social interaction. The normative expectation that children will construct these working models, coupled with high demands for conformity to group social norms, lead to lower social acceptance among children who are hesitant to engage in social interactions with peers.

Additional empirical evidence supports the link between shyness, social acceptance, and low self-esteem. Spence and colleagues (1999) examined the social

acceptance of shy children ranging in age from 7 to 14 years. Not only were these children described as less socially competent by peers, parents, and the children themselves, but they also received significantly fewer positive responses from peers when compared to more sociable children. These authors also found a significant association between shyness, low social acceptance, and low self-esteem, but noted the need for longitudinal studies to untangle the direction of effects involving these associations (Spence, Donovan, & Brechman-Toussaint, 1999).

Parenting and Social Adjustment

The preceding studies paint a bleak picture for children whose shyness or other attributes places them at increased risk for low levels of social acceptance. Results from behavioral genetics studies, however, suggest that positive social adjustment is far from genetically determined (McGuire, Neiderhiser, Reiss, Hetherington, & Plomin, 1994; Edelbrock, Rende, Plomin, & Thompson, 1995). The ways in which parents respond to their children may play a critical role in children's development of social competence, social acceptance, and self-esteem (Barber & Harmon, 2002). Edelbrock and colleagues (1995), for example, though finding genetic factors to account for more than half of the variance in social withdrawal and social problems, found shared environmental factors, such as parenting, to account for about two-thirds of the variance in the quality of children's relationships.

Parents who are emotionally supportive and responsive to their child's individual needs may be especially critical in promoting health and wellness in children, especially as parents contribute to dispositional resources, such as self-confidence, that help to regulate emotional and behavioral functioning in multiple contexts (Repetti, Taylor, &

Seeman, 2002; Wyman, Sandler, Wolchik, & Nelson, 2000). Wyman and colleagues suggest that multiple positive interactions over time can lead to "cumulative competence promotion and stress protection (p. 156)," especially as resources are coordinated across multiple levels, such as school, community, and family.

Empirical findings support these assertions (Goodman & Brumley, 1990; Dekovic & Meeus, 1997; Deihl et al., 1997; Mantzicopoulos & Oh-Hwang, 1998; Roberts et al., 2000). Goodman and Brumley (1990) found maternal responsiveness and involvement to predict children's social success in an economically depressed African American sample. Consistent with attachment theory, these authors hypothesized that parental responsiveness may provide a secure base for children to reciprocate responsiveness to their parents, and eventually to peers. In a preadolescent sample, Roberts and colleagues (2000) found parental involvement and support to be positively associated with positive peer relationships, and found both parent and peer support to predict greater self-esteem. A significant interaction between parent and peer support was also found with high levels of both being especially predictive of high self-esteem. Deihl et al. (1997), using a cluster analysis of groups either increasing, remaining high, or remaining low on self-esteem, found positive family and peer relationships to be most consistently associated with the former two groups in students ranging from sixth to tenth grade. Finally, in a Dutch sample ages 12 to 18, maternal acceptance predicted both positive peer relations and high self-esteem (Dekovic & Meeus, 1997).

Parental responsiveness to their children through mutual problem-solving has also been associated with children's social success. In later adolescence, for example, parent-child discussions about appropriate behavior have been associated with psychosocial

maturity (Mantzicopoulos & Oh-Hwang, 1998). The authoritative parenting style, which typically includes high levels of mutual problem-solving (Maccoby & Martin, 1983), has also been associated with positive psychosocial outcomes in children and adolescents (e.g. Durbin, Darling, Steinberg, & Brown, 1993; Baumrind, 1995; McClun & Merrell, 1998). Durbin and colleagues (1993) found authoritative parenting to be associated with successful peer interactions, and Baumrind (1995) has reported a positive association of authoritative parenting with social responsibility. Furthermore, McClun and Merrell (1998) found authoritative parenting to be positively associated with both social competence and self-esteem in a sample of eighth and ninth grade students.

Specific outcomes with shy children. Finding those factors that are beneficial to the social adjustment of all children is only a preliminary step in understanding how children are differentially affected by the same factors operating at various ecological levels. An important development in the parent-child socialization literature has been an enhanced recognition of the importance of child temperament when considering the relationship of parenting practices to child outcomes. Current research suggests that social development is not only influenced by parenting, but also by the dynamic interchange between children's unique characteristics, such as shy temperament, and their experiences in the family and other social settings (Quinton et al., 1993 cited in O'Connor & Rutter, 1996).

Although some parenting practices may be beneficial across multiple temperaments, recent evidence suggests parenting and children's physiological processes, which vary according to temperament (Kagan, Snidman, & Arcus, 1993), are interrelated in their influence on child social behavior. Very few studies have examined the

interaction of parenting and temperament in predicting children's social adjustment. Kagan and colleagues have speculated that as many as 40% of adolescents who shift from shyness to greater sociability during childhood may be the recipients of optimal parenting strategies (Kagan, Reznick, & Snidman, 1987). Although family environments in which positive communication is modeled and parents are responsive to the child's individual needs may be universally beneficial (Gray & Steinberg, 1999), these parenting practices may be especially effective in encouraging positive social adjustment in shy children (Fox & Calkins, 1993, Wachs, 1994).

Some studies of shy children have documented the use of directive, controlling parenting (LaFreniere & Dumas, 1992; Messer & Beidel, 1994; Rogers, Buchanan, & Winchell, 2002), but others (e.g. Hastings & Rubin, 1999) have reported more responsive parenting behaviors with shy children. Protective mothers of shy children, for example, reported that they would most likely use warmth and involvement to socialize their children, especially their shy daughters (Hastings & Rubin, 1999). Empirical support for the importance of nurturant, involved parenting has been found in both animal studies and studies of human families. In a recent animal study, rat pups whose mothers were nurturant (licking, grooming) displayed diminished levels of anxiety while in stressful situations (Meaney et al., 1988, cited in Repetti et al., 2002). These rat pups also showed more exploration of their environment than pups whose mothers were not nurturant. In research with rhesus monkeys, Suomi (1987) found that infants with high sympathetic reactivity became more exploratory than low-reactive infant monkeys after nurturant caregiving from an unrelated female.

In human samples, parental responsiveness and positive problem-solving has been associated with greater social competence in early childhood (Mize & Pettit, 1997) and middle childhood (Eisenberg, Fabes, & Murphy, 1996) and diminished levels of shyness in early adolescence (Miller, 2001). Mize and Pettit (1997) found parental responsiveness to moderate the effect of poor social skill modeling on preschoolers' social competence. Although parents' poor social coaching was positively associated with children's diminished competence, parental responsiveness served a compensatory function in encouraging greater social competence.

In sum, the social adjustment of moderately shy children may be highly sensitive to environmental influence (Buss & Plomin, 1984). Parents whose responsiveness and positive problem-solving allow these children sufficient autonomy while providing important modeling and guidance may encourage greater social acceptance, especially if interactions within the home serve as positive models of constructive social interaction.

Theoretical Framework

Two primary theoretical frameworks were used as a foundation for the hypothesized model to be tested in the present study. First, developmental systems theory will be discussed, followed by a more recently developed framework, self-presentation theory.

Developmental systems theory. According to developmental systems theory, developmental possibilities are constrained by three primary factors: personal characteristics, contextual factors, and the individual's current health (Ford & Lerner, 1992). In any subpopulation of children, none of these factors are static. For example, although shy children are constrained by a relatively stable behavioral inhibition system

that has a low threshold of excitability to novel stimuli, Kagan (2001) found that only 25% of children who were classified as inhibited in their second year of life were classified as shy at age 7. This is consonant with the idea of relative plasticity, which assumes that constraints on developmental possibilities are somewhat flexible. Furthermore, these constraints, which may be conceptualized as influences at various ecological levels, are reciprocally influencing one another in a process known as dynamic interactionism (Ford & Lerner, 1992), which renders developmental outcomes even more probabilistic.

Applying the ideas of developmental systems theory to the social development of shy children requires examining how genetic and contextual factors interrelate to promote either change or stability in social trajectories. Even if genotype is stable, there are many different ways that a particular genotype can be expressed phenotypically depending on environmental context (Ford & Lerner, 1992). Therefore, the possibility certainly exists that children with behaviorally inhibited temperaments can learn to interact effectively given the appropriate parenting context.

Chess and Thomas (1989), pioneers in the field of temperament, viewed positive child adjustment as the result of the goodness of fit between child temperament and the demands of the environment, which includes parenting practices. Indeed, the proximal processes involved in parent-child relationships, according to Bronfenbrenner and Morris (1998), are the primary forces driving child development Therefore, different parenting strategies should be highly influential in encouraging different outcomes for children with different temperaments (Sanson & Rothbart, 1995).

Self-presentation theory. Self-presentation theory, like developmental systems theory, highlights the importance of social context in children's social and psychological adjustment. The central proposition of Leary's self-presentation theory (Schlenker & Leary, 1982) is that social anxiety arises when people desire to make a positive impression on others, but doubt that they are able to make that impression. To the extent that individuals are unable to garner others' social acceptance by making positive impressions, their self-esteem is hypothesized to suffer.

From this perspective, interpersonal relationships marked by social acceptance are seen as fundamental for human survival. Indeed, self-presentation theory sees social acceptance as being so significant that it proposes the existence of a motivational-affective system within each individual throughout most of human history. This system, which Leary calls the sociometer, monitors one's level of social acceptance or devaluation in various environments. According to Leary, decreases in self-esteem warn the individual of potential drops in social acceptance. Additionally, individuals whose social acceptance continues to suffer are hypothesized to experience further decreases in self-esteem, thus suggesting a reciprocal relationship between these constructs (Leary et al., 1995). Individuals who fail to take remedial action, such as withdraw, or attempt to act in a more agreeable fashion, may continue to experience deficits in self-esteem as a result of social exclusion from the peer group (Leary, 2001).

Self-presentation theory, therefore, proposes the self-esteem system to act as a sociometer to monitor the extent to which one is accepted or excluded by relevant peer groups (Leary et al., 1995). From this perspective, events and interactions that are perceived as threats to self-esteem are essentially situations that threaten one's social

acceptance. Leary and colleagues have found empirical support for this relationship in undergraduate samples (Leary et al., 1995). Leary and colleagues (1995), for example, reported the correlation between perceived social exclusion and self-perceptions to closely approach the reliability of their scales, thus leading them to designate self-perceptions as a proxy for perceived exclusion. Empirical results suggest that the sociometer is especially sensitive to drops in social acceptance. Leary and colleagues (1995), for example, found that failure to be accepted in a peer group was a much stronger predictor of self-esteem than acceptance by the group. This finding suggests the present study's hypothesized positive association between social acceptance and self-esteem may be especially true for youth who fail to be accepted socially.

Self-presentation theory proposes several key factors that influence one's social acceptance and self-esteem. These factors include social competence, physical appearance, violation of accepted codes of behavior, and the extent to which individuals are boring or unappealing as partners in social interaction (Leary, 2001). An important corollary of self-presentation theory is that increases in interpersonal competence tend to be associated with greater social acceptance. Parents who instill this competence in their children through engaging in positive problem-solving with them may, therefore, encourage their children's social acceptance. Furthermore, due to the self-presentation theory's proposed link between social acceptance and self-esteem, children who learn important social skills through positive problem-solving with their parents may gain the interpersonal competence needed to not only bolster their social acceptance, but also their self-esteem.

CHAPTER 3

METHODS

Participants

The sample used in the present study was recruited for the Adolescent Development Research Program (ADRP) under the direction of Gene Brody at the University of Georgia. Three waves of data were collected between April of 1994 to December of 1997 as part of a longitudinal study of family processes and alcohol use norms. Data were collected from young adolescents ages 11 to 15 years, their parents, their peers, their favorite teacher, and the older siblings of youths who had siblings. From north and central Georgia and two counties in South Carolina, 231 rural families were recruited for the study.

All demographic information is summarized in Table 1. The sample consisted primarily of White (76%) and African American (23%) families. All parents were biological parents of a target child, with approximately equal numbers of boys (N = 115) and girls (N = 116) participating. Age ranges at wave 1 were 30 to 70 for fathers (M = 41.28, SD = 5.60), 28 to 50 for mothers, (M = 38.58, SD = 4.61), and 10 to 13 for target children (M = 12.02, SD = 0.63). Total annual income ranged from $3,522 to $226,032 ($M$ = $52,251, SD = $27,765). Approximately 73% of mothers and 77% of fathers had received at least some college or trade school training beyond high school. This was the most common level of education in the sample (Brody & Ge, 2001).

Table 1

Demographic Characteristics of Sample at Time 1 (N = 231)

Variable	M or %	SD
Child		
Age (years)	12.02	0.63
% Female	50.2	
Mother		
Age (years)	38.58	4.61
Education		
Less than high school	3.9%	
High school or GED only	23.5%	
More than high school	72.6%	
Father		
Age (years)	41.28	5.60
Education		
Less than high school	8.5%	
High school or GED only	14.5%	
More than high school	77.0%	
Family		
Annual income	$52251	$27765

The families were recruited by randomly sampling from a telephone directory. Families who were selected were sent a letter familiarizing them with the purposes of the study and informing them that someone would contact them regarding their desire to participate. Ultimately, 231 families participated in the first wave, 176 families participated in the second wave, and 183 families participated in the third wave of the study. Because teacher participation was more difficult to secure, only 177 teachers provided data for wave 1 of the study, 131 for wave 2, and 152 for wave 3 (Brody & Ge, 2001). Due primarily to teacher data not being available in wave 2 for many students, complete data on all study variables is available for only 52 target children across all three waves.

The proportion of wave 1 families with complete data in waves 2 or 3 was 0.29, the result of dividing the number of targets with complete data across all waves by the number of targets with complete data in wave 1. Therefore, about 29% of the families who provided complete data in wave 1 continued to provide complete data in waves 2 and 3. This attrition rate is similar to those found in other studies using reporters outside the family, such as teachers (Forehand, 1990). Differences between families with complete data and those with incomplete data were assessed using t-tests. The variables on which these families were compared included parents' education, parents' income, parents' reports of problem-solving at wave 2, targets' reports of self-esteem at waves 2 and 3, teachers' reports of the targets' shyness at wave 1, and teachers' reports of the targets' social acceptance at waves 1 and 2. The only area in which statistically significant differences emerged was teachers' reports of the targets' social acceptance at wave 2 (t = -3.25, p = .001). Targets with complete data scored about one-half a standard

deviation higher at wave 2 than targets with incomplete data. Therefore, consideration should be given to this result being a source of bias in the interpretation of findings involving wave 2 social acceptance.

Procedure

Wave 1 data were collected between April 1994 and December 1995 from the target child, an older sibling when available, a best friend of the child, and parents during visits to families' homes. Wave 2 data were collected between July 1995 and December 1996 from 176 of the original 232 families. Wave 3 data were collected between August 1996 and December 1997 from 183 of the original families. Complete data were provided by 159 families across waves 1 and 2, and 158 families across waves 1 and 3.

Family data. Two interviewers visited each family on two different occasions, approximately one week apart. Interviewer and family were matched on ethnicity to reduce potential reporting bias. Laptop computers were used to enable data to be entered conveniently and stored on a disk, as well as to reduce errors associated with data transcription and entry. The respondents were presented with one question at a time and entered the answers themselves (Brody & Ge, 2001).

Procedures for collecting family data in waves 2 and 3 were similar to those employed in wave 1. For wave1, parents were paid $50 for their participation and targets were paid $10. In wave 2, parents were paid $60 and targets were paid $20. In wave 3, parents were again paid $60, but targets' honoraria increased to $30.

Teacher data. Data were gathered from children's teachers via questionnaires mailed to the schools. Informed consent was obtained from the parents of the adolescents prior to test administration. Permission and cooperation were also secured from each

school district and school that participants attended. Secretaries distributed the questionnaires to the teachers, then returned them after teachers had completed them. Teachers were sent up to three reminder letters if packets were not returned promptly. In wave 1, teachers were paid $5 for each questionnaire completed. In wave 2, teachers' honoraria was increased to $10 per completed questionnaire, and was increased to $20 per questionnaire in wave 3. Secretaries were paid $5 per completed questionnaire that was returned in each of the three waves.

Measures

Shyness. The target child's shyness was assessed only at wave 1. Shyness was assessed based on reports from teachers using the Shyness subscale of the Early Adolescent Temperament Questionnaire (Capaldi & Rothbart, 1992). The subscale includes nine items rated on a five-point scale ranging from 1 (very false) to 5 (very true). Items tapped the child's general shyness, quietness and social initiative. Reliability analyses with ADRP data indicated an alpha of .92 for teachers' report of shyness. Capaldi and Rothbart (1992) reported an alpha of .79 and test-retest reliability of .84. Capaldi and Rothbart (1992) replicated their original study to verify the validity of their scale's temperament dimensions. The discriminant validity was established by eliminating those scales that had a higher correlation with another scale than the item-total correlation with its own scale (Capaldi & Rothbart, 1992).

In the present study, shyness assesses a reluctance to exercise social initiative with both familiar and unfamiliar individuals. This conceptualization is highly consistent with Asendorpf's (1990) definition, which includes a pronounced tendency to avoid social interaction, even though the child may wish to interact. It should be noted that the

present sample consists primarily of individuals with low to moderate levels of shyness. Specifically, only 13.6% of the wave 1 sample scored greater than one standard deviation above the mean on the shyness subscale. The mean of 2.47 (out of 5), furthermore, represents about the halfway point between a score of 2 (mostly false) and 3 (neither true nor false) in response to statements indicative of shy behavior. The average score, therefore, indicated at least mild disagreement with statements suggesting that the target child was shy. In sum, the present sample contains only a small subset of youth who demonstrate noticeably shy behavior. The range of scores are best conceptualized as reflecting a continuum of social initiative, with higher scores indicating less social initative, especially with unfamiliar peers and adults.

Social acceptance. The target child's level of social acceptance with peers was assessed at both wave 1 and wave 2. Social acceptance was assessed using teachers' reports on the Social Acceptance Measure (SAM), which was constructed by ADRP staff for the purposes of their initial study. The scale consists of 17 items rated on a five-point scale, ranging from 1 (always false) to 5 (always true). Items tapped the extent to which the targets were accepted and liked by their peers. Item analyses with ADRP data indicated excellent reliability, with alphas ranging from .91 at wave 1 to .88 at wave 2. Harter (1998) has asserted a strong link between social acceptance and social competence. ADRP data indicate a strong correlation ($r = .90$, $p < .001$) at wave 2 between social acceptance as measured by the SAM and social competence as measured by the Harter Scale (Harter, 1982), thus providing evidence of concurrent validity. Typical SAM items include "Well liked by classmates," "Can easily join in with a group of children," and "Makes friends easily."

Parental responsiveness. Parental responsiveness to the target child was assessed via parents' reports at wave 2. Parental responsiveness was based on each parent's individual report of positive problem-solving with the target child. The Positive Problem-solving Scale was developed by Conger and colleagues (1992) to measure warm and involved parenting. Because each parent perceives each child, and therefore responds to each child in unique ways (Mills & Rubin, 1992), models involving mothers' and fathers' problem-solving were analyzed separately.

The Positive Problem-solving subscale includes four items rated on a five-point scale ranging from 1 (never) to 5 (always). High scores indicate high levels of positive problem-solving. Positive problem-solving was conceptualized as having good listening skills, considering another's feelings, and being able to resolve disagreements. Alphas for Positive Problem-solving were .62 for father's report and .68 for mother's report.

Self-esteem. Targets' self-esteem was assessed via targets' self-report at both wave 2 and wave 3. The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) was used to assess targets' level of self-esteem. This scale consists of 10 items rated on a six-point scale ranging from 1 (completely false) to 6 (completely true). Five items tapping negative self-esteem and five items tapping positive self-esteem are summed for form a total self-esteem score. ADRP data indicate alphas of .86 at wave 2 and .81 at wave 3 for the overall scale. Typical items include "You feel like you have a number of good qualities," and "On the whole, you are satisfied with yourself."

Statistical Analyses

LISREL 8.54 (Joreskog & Sorbom, 2003) was used to test each of present study's four hypotheses. This version of LISREL is especially beneficial due to its full

information maximum likelihood (FiML; Finkbeiner, 1979) feature, which uses a likelihood function at the individual level to predict model parameters. FiML differs from multiple imputation, another common missing data procedure, in that FiML computes parameter estimates directly from the raw data (Enders, 2001). Multiple imputation creates multiple sets of imputed values and a matching number of complete data matrices, which are then analyzed by standard methods (Little & Rubin, 1989). FiML, in contrast, does not include any preliminary data preparation steps. For each individual with missing data on a particular variable or variables, the maximum likelihood function uses available data and parameter estimates involving variables with available values to obtain a likelihood value or values for that individual. The overall estimates are obtained by summing the casewise likelihood functions (Enders, 2001). Assigning each of the missing data points an arbitrary value, such as –9 or –999, and specifying this on the data (da) line of the LISREL model syntax is sufficient to activate the FiML function in LISREL 8.54. Missing data points were assigned a value of –999.00 in the present study.

The percentage of missing values ranged from 20-24% depending on the model being tested. Full information maximum likelihood is preferred to pairwise or listwise deletion procedures in that much less bias is associated with parameter estimates using the former method (Arbuckle & Wothke, 1999). In a recent Monte Carlo study, for example, full information maximum likelihood provided superior parameter estimates when compared to pairwise and listwise deletion for all levels of missing data (Enders & Bandalos, 2001).

Measurement issues. In each of the models tested, each variable was represented by only a single indicator. Therefore, all variables were manifest variables, resulting in

what is most appropriately termed a path analysis. Using LISREL syntax, this involved specifying lambda-y as an identity matrix due to each indicator loading perfectly (1.0) on its corresponding variable. For example, the Social Acceptance Measure had a perfect 1.0 loading on the latent construct social acceptance, and had loadings of zero on all other constructs in the model.

The perfect 1.0 loading from each observed measure to its latent counterpart does not mean that each of the constructs was measured without error. The imperfect reliability of each measurement instrument represents the measurement error inherent in estimating the latent constructs from observed measures. In the absence of perfect reliability, the path coefficients representing the relationships among the observed variables is decreased relative to the corresponding path coefficients in the latent variable model (Bollen, 1989). To correct for measurement error, Bollen (1989) recommends specifying the proportion of variance in each variable that may be attributed to less than perfect reliability. This is accomplished by multiplying the total variance (σ^2) of each variable by the proportion due to measurement error ($1-\rho_{yy}$), where ρ_{yy} represents the reliability of the variable. Bollen's recommendation was incorporated into each of the current study's models by fixing the error variance of each observed variable in the theta-epsilon matrix to a value equal to (σ^2) ($1-\rho_{yy}$).

Nested models and goodness of fit. In addition to correcting for measurement error, directly specifying the amount of error for each measured variable also allowed for stronger goodness of fit tests via an increased degree of freedom for each error term that was fixed to a specific value. Another common strategy for assessing the relative goodness of fit of competing models is the use of nested models (Widamon, 1985). Using

this approach begins with testing the fit of a baseline model in which none of the parameters of interest are freely estimated. The covariance matrix for the five variables of interest in the present study includes 15 pieces of information. The only parameters estimated in the baseline model are the five variances in the Psi matrix, so the baseline model will have 10 degrees of freedom. Testing this model will provide a baseline chi-squared value to which the chi-squared values of less restrictive models will be compared. For example, freeing the path from time 1 shyness to time 2 social acceptance should improve the fit of the model and will also provide an estimate of the strength of this association. The difference in chi-squared values with the associated difference in degrees of freedom can then be plotted on a standard chi-squared distribution table to assess whether freeing the path of interest resulted in a statistically significant improvement in fit. Both the statistical significance of path coefficients and statistically significant improvements in fit will be used to test each of the following two hypotheses.

Hypothesis 1. The first hypothesis asserts that time 1 shyness will be negatively associated with time 2 social acceptance over the transition to adolescence and will account for a significant decrease in social acceptance from time 1 to time 2. The association between time 1 shyness and time 2 social acceptance was expected to remain negative and statistically significant after the predictive influence of time 1 social acceptance was taken into account. Many factors may account for change in social acceptance from time 1 to time 2. These factors include the child's maturation, other unmeasured factors, and random fluctuations in the measurement of social acceptance at two time points. Although measurement error is accounted for in the model (σ^2) $(1-\rho_{yy})$,

other factors that may account for change in social acceptance must be considered in the interpretation of results.

The association of wave 1 shyness to wave 2 social acceptance was tested by freely estimating this path in the beta matrix, the full matrix typically used to test causal relations among the latent variables. Freeing this path was expected to result in a statistically significant improvement in fit over the baseline model. Furthermore, the path from shyness to social acceptance was expected to be negative with a t-value whose absolute value exceeded 1.64, which indicates statistical significance at the .05 level for a unidirectional hypothesis. Although all five variables were included in analyses, only the freely estimated path is represented in Figure 1. Each of the observed measures (rectangles) is expected to be influenced by both the latent construct (ovals) and measurement error.

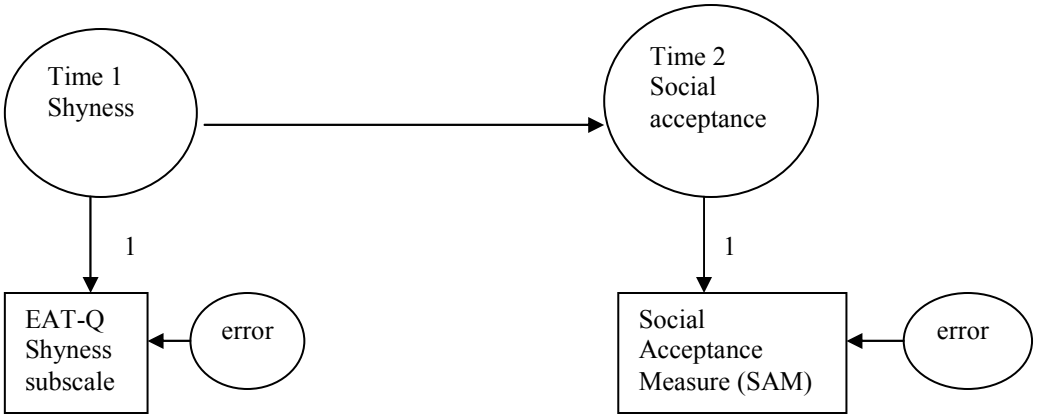


Figure 1. Estimating the association of time 1 shyness to time 2 social acceptance.

Testing the second part of hypothesis 1 involved freely estimating the paths from both shyness and social acceptance at wave 1 to social acceptance at wave 2. Freely

estimating the path from wave 1 to wave 2 social acceptance allowed the model to assess the amount of variability in time 2 social acceptance that was not accounted for by time 1 social acceptance. The unique variance accounted for by time 1 shyness is called the residual gain score, and tends to provide increased reliability over a simple difference score (Cronbach & Furby, 1970), although Rogosa (1995) has noted that residual gain scores may be a biased estimate of true residual change. Results of the present analyses should therefore be interpreted with caution.

In accordance with hypothesis 1, the path from shyness to social acceptance was expected to remain significant and negative, thereby supporting shyness as a contributor to declines in social acceptance. This model is represented in Figure 2. Improvement in fit of this model over each of the more restrictive models was also used to assess the extent to which the second part of hypothesis 1 was supported. In addition to a model with only the paths from time 1 shyness to each of the time 2 variables freely estimated, a model in which time 1 covariance of shyness and social acceptance was also estimated. This is represented in Figure 2 by the double arrows connecting shyness and social acceptance at wave 1. This covariance was estimated in the Psi matrix, the covariance matrix of latent residuals. Although the improvement in fit of this model over previous models will be tested, this test does not bear directly on hypothesis 1.

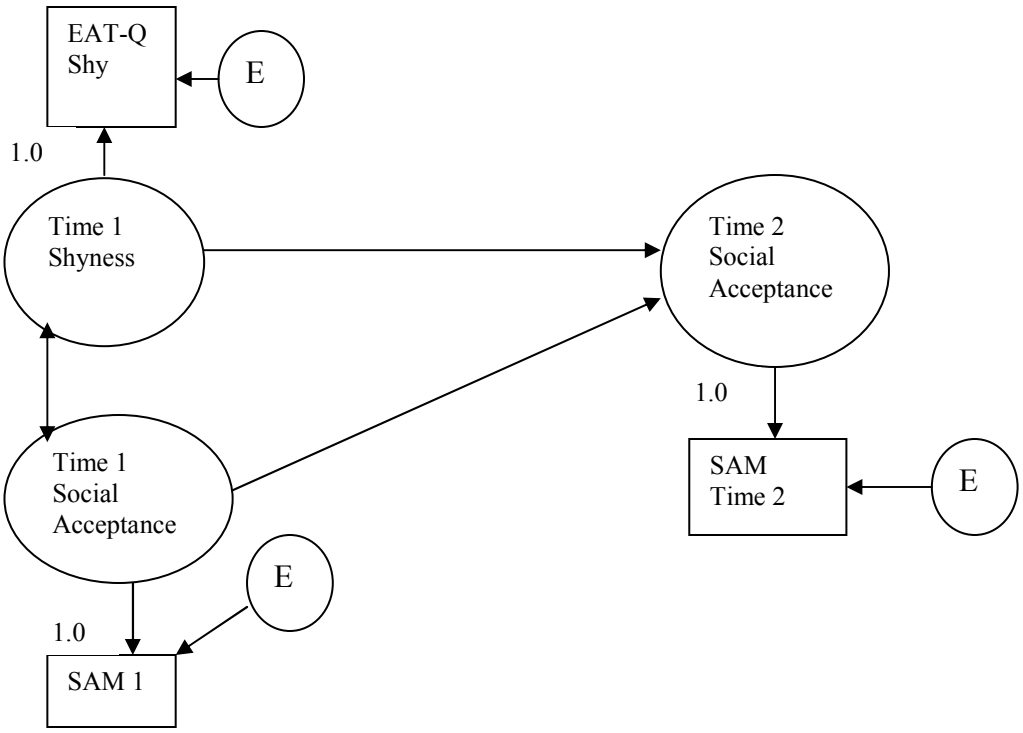


Figure 2. Time 1 shyness and social acceptance predicting time 2 social acceptance.

Hypothesis 2. The second hypothesis asserts that time 1 shyness will be negatively associated with time 3 self-esteem and will account for a significant decrease in self-esteem from time 2 to time 3. The association between time 1 shyness and time 3 self-esteem was expected to remain negative and statistically significant after the predictive influence of time 2 self-esteem was taken into account. As in the first model, unmeasured factors other than shyness that may account for change in self-esteem should be considered in the interpretation of results.

The direct relationship of time 1 shyness to time 3 self-esteem was assessed by freely estimating this path in addition to the paths freed in the previous models. Freeing this path was expected to result in a statistically significant improvement in fit over the

model represented in Figure 2. Furthermore, the path from shyness to self-esteem was expected to be statistically significant and negative. Finally, the path from time 2 to time 3 self-esteem was freed in order to control for self-esteem at time 2. Although not hypothesized, this was also expected to result in a statistically significant improvement in fit over each of the more restrictive models. Paths from both shyness at wave 1 and self-esteem at wave 2 to self-esteem at wave 3 were freely estimated in this model, which is represented in Figure 3. Social acceptance is also included in Figure 3 to illustrate the totality of the paths estimated for hypotheses 1 and 2. Again, there is a one-to one relationship between the observed and latent variables, and the error (E) feeding into each observed variable represents the measurement error that was directly specified in the model as the amount of unreliable variance in each construct.

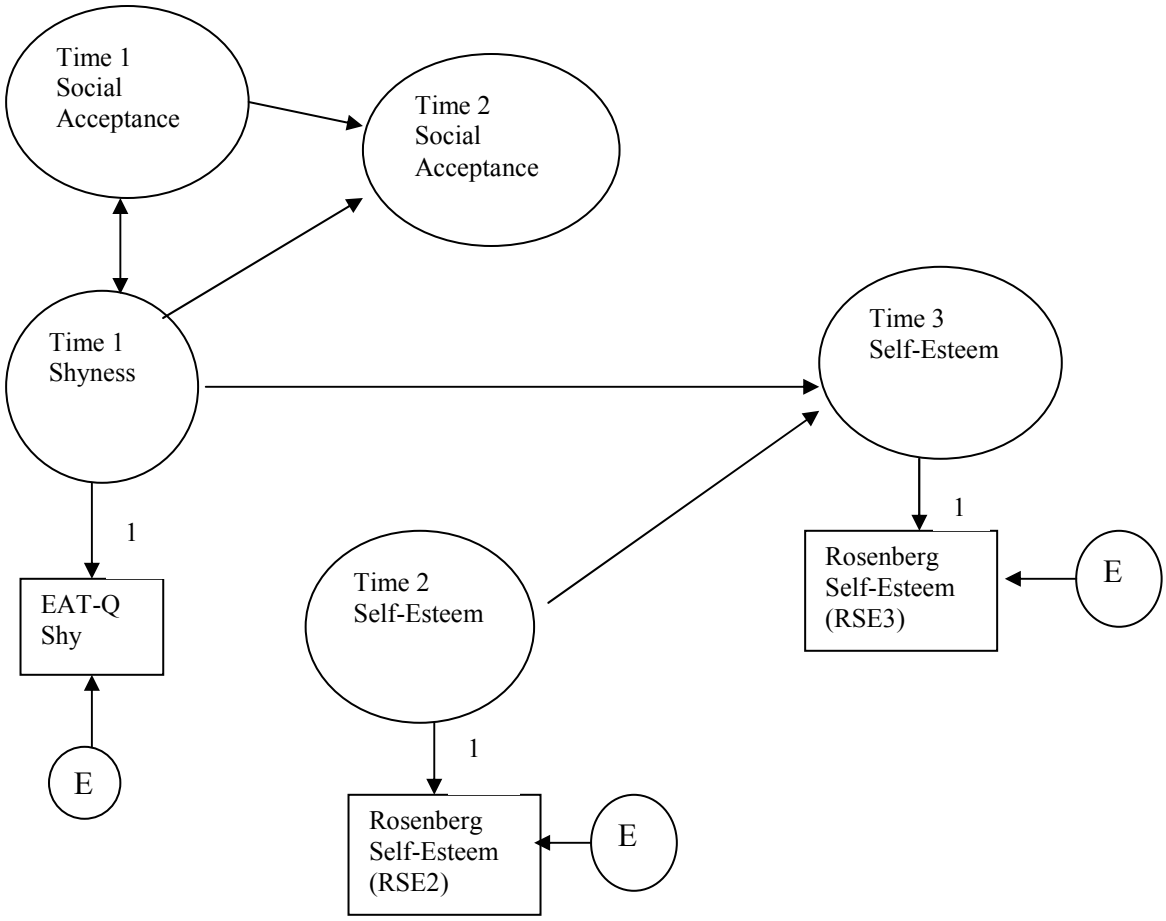


Figure 3. Model with all paths from hypotheses 1 and 2 freely estimated.

Hypothesis 3. The third hypothesis states that social acceptance will mediate the tendency for shyness to be associated with significantly diminished self-esteem over the transition to adolescence. Specifically, a significant proportion of the total effect of time 1 shyness on time 3 self-esteem was expected to be accounted for by the indirect paths from shyness to social acceptance, and social acceptance to self-esteem.

Over the past 25 years a growing body of literature has addressed the issues involved in testing the effects of intervening variables such as mediators and moderators.

Baron and Kenny (1986) describe a mediator as an intervening variable that "accounts for the relation between the predictor and the criterion" (p. 1176). These authors specified four conditions that are essential in determining if a particular variable mediates the relationship between two other variables. In the language of the present study, 1) wave 1 shyness must show a statistically significant association with wave 2 social acceptance; 2) wave 1 shyness must show a statistically significant association with wave 3 self-esteem; 3) wave 2 social acceptance must show a statistically significant association with wave 3 self-esteem, and 4) when both shyness and social acceptance are included in a model predicting self-esteem at wave 3, the path from shyness to self-esteem must be smaller than it was in step 2. The conditions for mediation outlined by Judd and Kenny (1981) are similar, with the primary difference being the latter authors' (1981) emphasis on complete mediation. Specifically, Judd and Kenny recommended that causal variable exert an effect on the outcome that is not statistically different from zero when the mediator is included in the model.

The guidelines followed in the present study are those outlined by Kenny, Kashy, and Bolger (1998) in a combined restatement of the two previously mentioned sets of guidelines. The four steps are as follows. 1) Shyness must be related to self-esteem in order for there to be an effect to be mediated; 2) shyness must be related to social acceptance, 3) social acceptance must be related to self-esteem when shyness is included as a predictor of self-esteem, and 4) shyness must have a significantly diminished relationship with self-esteem when social acceptance is also included as a predictor. According to Kenny et al. (1998), if the direct path from shyness to self-esteem is non-

zero, but the path outlined in step 4 does not differ significantly from zero, complete mediation is established (Shrout & Bolger, 2002).

Baron and Kenny (1986) have argued for the importance of partial mediation. Because different degrees of mediation may be present, a measure of effect size provides valuable information regarding the strength of a mediating variable. Given that the conditions for mediation are met, Shrout and Bolger (2002) have offered a ratio, P_M, to indicate the proportion of the treatment-outcome relationship that is mediated by a third variable. Consider X as the treatment, Y as the outcome, and Z as the mediator. P_M is the indirect effect of X on Y divided by the total effect of X on Y. Using Figure 4 as an example, the indirect effect is computed by multiplying the standardized path coefficient for path a by the path coefficient for path b. The total effect of X on Y is found by adding the indirect effect to the direct effect (c'), which in the present model is represented as the influence of X on Y when the effect of Z is taken into account (Bollen, 1989). If the direct effect is reduced to zero by the inclusion of the mediator (Z) in the model, then the total effect of X on Y is completely accounted for by the indirect effect, and one can say that 100% of the relationship of X to Y is mediated by Z.

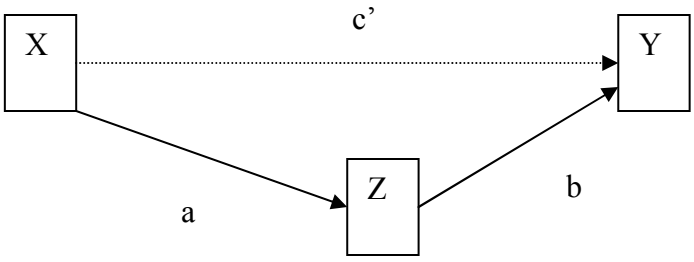


Figure 4. Mediational model with indirect effects.

The first step in testing for mediation was to assess the strength of the path from time 1 shyness to time 3 self-esteem. Starting with a baseline model with all causal paths fixed to zero, the association of time 1shyness and time 3 self-esteem was tested by freeing this path in the beta matrix. This path was expected to be statistically significant and negative with a t-value exceeding 1.64. Furthermore, freely estimating this path was expected to result in a significant improvement in the fit of the model as evidenced by a statistically significant decrease in the chi-squared value. To test the second of Kenny and colleague's four conditions, the path in the beta matrix from wave 1 shyness to wave 2 social acceptance was also freely estimated. This was also expected to result in a significant improvement in the fit of the model as evidenced by a statistically significant decrease in the chi-squared value. As with the first condition, this path was expected to be negative and statistically significant. The third condition was tested by also freely estimating the path from wave 2 social acceptance to wave 3 self-esteem. The primary interest was assessing the effect of social acceptance on self-esteem when the wave 1 effects of shyness were taken into account. Again, freeing this path was expected to result in a further improvement in the fit of the model. This path, unlike the paths of interest in the previous two conditional tests, was expected to be positive.

Satisfying Kenny and colleagues' final condition required that time 1 shyness have a significantly diminished association with time 3 self-esteem when the path from time 2 social acceptance to time 3 self-esteem is freely estimated. According to Baron & Kenny (1986), perfect mediation would occur if the path from time 1 shyness to time 3 self-esteem reduced to zero, thus establishing social acceptance as fully mediating the link between shyness and self-esteem across a three year period. Given that the

conditions for mediation are met (Kenny et al., 1998), however, the proportion of the total effect mediated (P_M) will be calculated and reported. Figure 5 shows the mediational model.

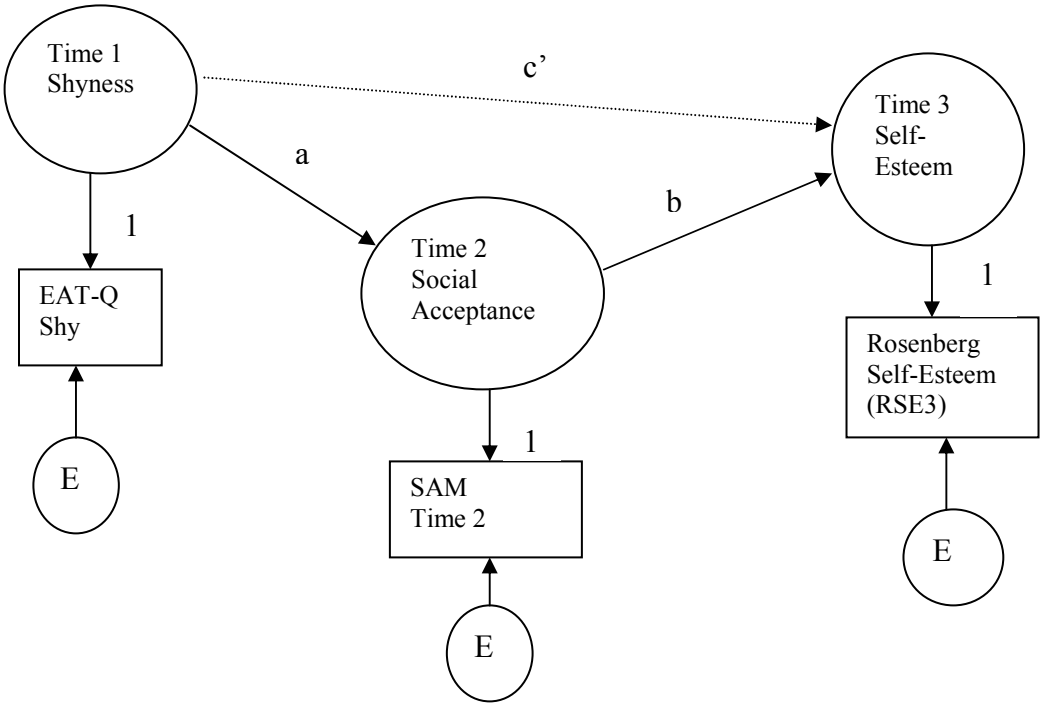


Figure 5. Mediational model. The product of a and b is the indirect effect of shyness on self-esteem, and c' is the direct effect of shyness on self-esteem with the indirect influence of social acceptance taken into account.

Hypothesis 4: The fourth hypothesis states that the tendency for shyness to predict decreases in social acceptance and self-esteem will be moderated by parents' positive problem-solving such that high levels of problem-solving will be associated with increased social acceptance and self-esteem. The predicted negative associations between shyness and both social acceptance and self-esteem were expected to reduce to statistical non-significance under the condition of high parental problem solving, but were expected

remain statistically significant and negative under the condition of low parental problem solving.

Testing this hypothesis involved a series of steps for both mothers and fathers. First, both mothers' and fathers' positive problem-solving scores were divided at the median, such that high and low problem-solving groups were established for both mothers and fathers. Using these problem-solving groups, a two-group analysis was then conducted using LISREL 8.54 (Joreskog & Sorbom, 2003).

According to Vandenberg and Lance (2000), the comparison of two or more groups requires the establishment of measurement invariance across the groups. Measurement invariance provides a degree of certainty that one is measuring the same attributes across groups. If measurement invariance cannot be established, then differences between the groups cannot be interpreted with much certainty (Horn & McArdle, 1992). Two tests of measurement invariance were conducted in the present study – one for mothers and fathers, and another for low and high problem-solving groups.

The model used to test for metric invariance across mothers and fathers included two latent variables, mothers' problem solving and fathers' problem solving. Three positive problem solving subscale items for father loaded freely on the father variable with the first item given a loading of 1.0 for purposes of scaling. The same loadings were used for mothers. To test for equal item loadings across fathers and mothers, the residuals in the theta epsilon matrix were constrained to be equal across identical items. The error variance for each item was freely estimated. Figure 6 shows the model that was tested. The lines without arrows connecting the identical items across mothers and fathers

represent the equality restraints across groups. Latent variable residuals and variances were also freely estimated across groups.

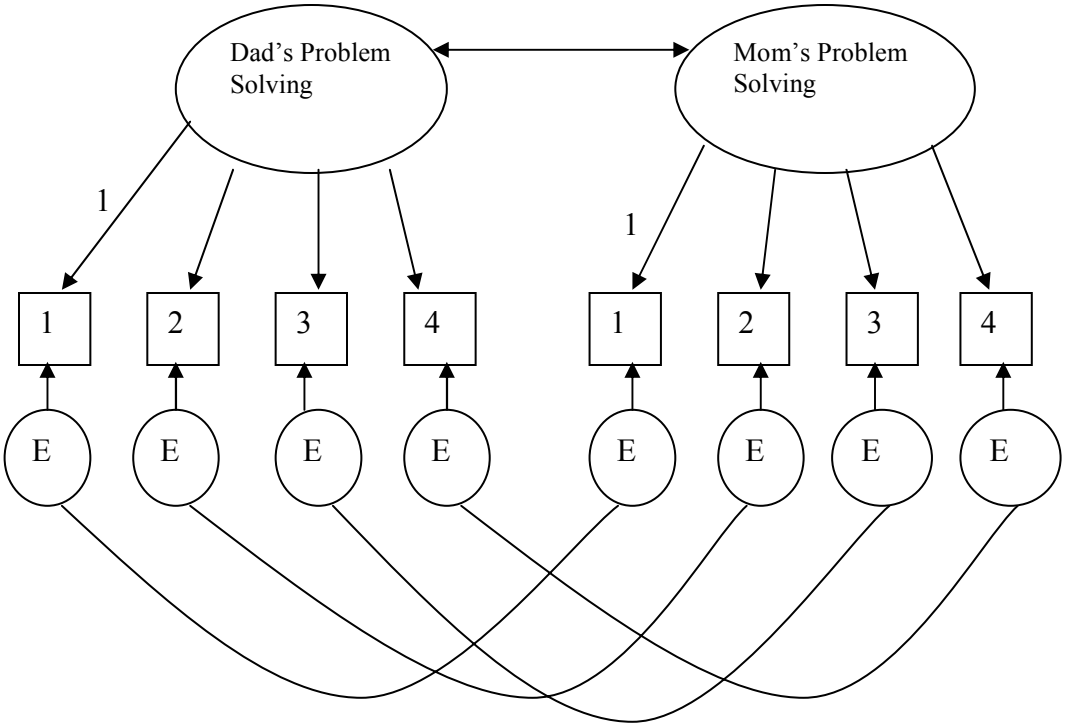


Figure 6. Testing for measurement invariance across fathers and mothers.

Similar within-parent models were tested for fathers and mothers in which measurement invariance across high and low positive problem solving groups was assessed. The model was similar to that shown in Figure 6. The primary difference was that the latent variables were high and low problem-solving groups for each parent.

Testing for moderation. To reiterate, the fourth hypothesis asserts that the tendency for shyness to predict decreases in social acceptance and self-esteem will be moderated by parents' positive problem-solving such that high levels of problem-solving will be associated with increased social acceptance and self-esteem. The following will

first describe analyses in which differences in the shyness-social acceptance relationship were assessed. High and low positive problem-solving groups based on mothers' reports of her problem-solving with her child will be compared followed by problem-solving groups based on fathers' reports.

As with previous hypotheses, a series of nested models was used to test one path at a time by 1) freeing this path in the first of two groups, 2) testing a baseline model in which the freed path is held invariant across high and low problem-solving groups, and 3) freeing the path across groups to assess the improvement in fit. Statistically significant improvements in fit provided evidence that parents' problem solving moderated the association of interest. Factor loadings, measurement error, and factor variances were freely estimated in the first group and held invariant in the second group for all of the following models.

To establish a baseline model for social acceptance, the path from shyness to social acceptance was freely estimated in the first group, but specified as invariant across both low and high positive problem-solving groups. Next, this path was freed across groups. To test for a significant improvement in fit in the model with the freed path, a chi-squared difference test was conducted. Two results were expected. First, freeing the path from shyness to social acceptance across low and high positive problem-solving groups was expected to result in a statistically significant improvement in fit, indicated by a significant decrease in the chi-squared value relative to the one degree of freedom lost by freeing the path across groups. Second, whereas the path from shyness to social acceptance was expected to be negative and significant for the low positive problem-

solving group, it was expected to reduce to non-significance in the high positive problem-solving group.

A similar analysis was conducted in which differences in the ability of shyness to account for residual variance in social acceptance was assessed. Two additional paths were freed in the first group – the path from time 1 social acceptance to time 2 social acceptance, and the covariance of shyness and social acceptance at time 1. This model is similar to Figure 2. A baseline model was assessed in which all paths were specified as invariant across groups. This was compared to a second model in which the path from time 1 shyness to time social acceptance was freed across groups. Again, freeing the path from shyness to social acceptance across low and high positive problem-solving groups was expected to result in a statistically significant improvement in fit, indicated by a significant decrease in the chi-squared value relative to the one degree of freedom lost by freeing the path across groups.

The second part of the fourth hypothesis asserts that parents' positive problem solving will moderate the relationship between time 1 shyness and time 3 self-esteem. The analyses used to test these relationships were similar to those used to test for moderation of the relationship between shyness and social acceptance. In addition to the three previously freed paths involving social acceptance, the path from time 1 shyness to time 3 self-esteem was also freed in the first group. These paths were specified as invariant across groups and a baseline chi-squared value was obtained. The path from time 1 shyness to time 3 self-esteem was then freed across groups and the fit of this model was compared to the baseline model. To test if parents' problem solving moderated the ability of time 1 shyness to account for residual variance in time 3 self-

esteem, the path from time 2 self-esteem to time 3 self-esteem was also freed in the first group. All paths were specified as invariant across groups to obtain a baseline fit, which was then compared to the fit of the model when the path from time 1 shyness to time 3 self-esteem was freed across groups.

A final concern addressed in these analyses concerns the different possible combinations of mothers' and fathers' positive problem solving. Some youth, for example, may have mothers who are high in problem solving and fathers who are low in problem solving. Because the empirical and theoretical foundation for such analyses is limited, no hypotheses are offered concerning the results. For exploratory purposes, the relationships between shyness and both social acceptance and self-esteem were compared across the following groups: 1) High problem-solving mothers with high problem-solving husbands versus high problem-solving mothers with low problem-solving husbands, and 2) High problem-solving fathers with high problem-solving wives versus high problem-solving fathers with low problem-solving wives.

Due to difficulties with negative error variances when all variables were included in the model, only the variables of interest were selected (using LISREL's SE command) for each model in the exploratory analyses. To test for moderation of the shyness-social acceptance relationship, for example, only time 1 shyness and time 2 social acceptance were selected for inclusion in the model. This greatly limited the degrees of freedom available to test each model. To provide sufficient degrees of freedom to test the models, Bollen's (1989) recommendation of fixing the error variance of each observed variable in the theta-epsilon matrix to a value equal to $(\sigma^2)(1-\rho_{yy})$ was followed.

The Hypothesized Model

Figure 7 presents the complete model of all hypothesized paths.

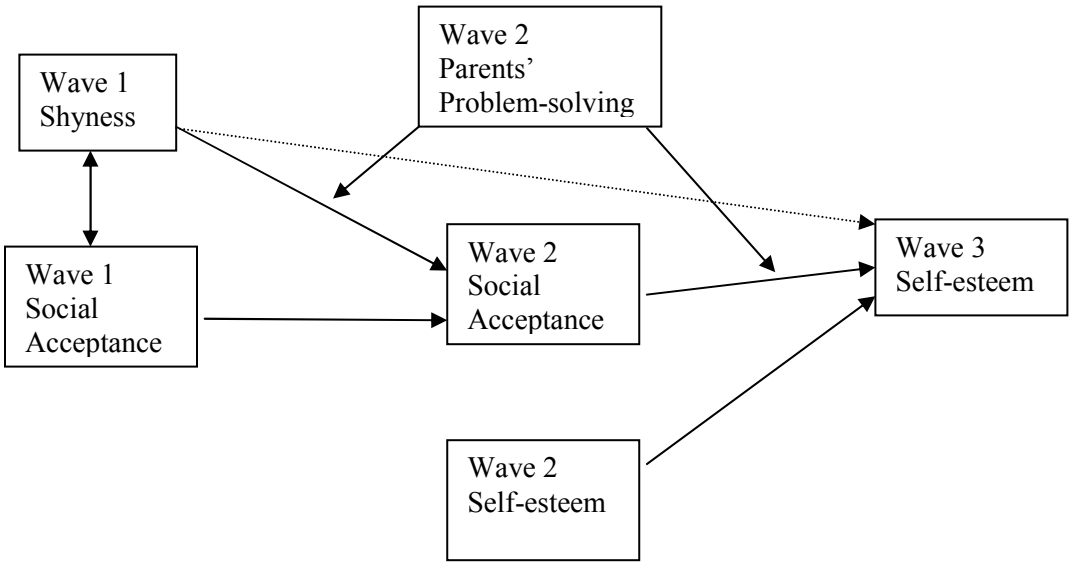


Figure 7. Hypothesized model for all study variables.

As can be seen, social acceptance is hypothesized as a necessary link between shyness and self-esteem. Furthermore, shyness is hypothesized to account for significant residual variance in social acceptance from wave 1 to wave 2 and in self-esteem from wave 2 to wave 3. Finally, the arrow from parent's problem-solving that intercepts the paths from shyness to social acceptance and shyness to self-esteem represents the hypothesized moderational effect of positive problem-solving on these links. The latent variables, factor loadings, and errors are omitted for the sake of simplicity.

CHAPTER 4

RESULTS

This chapter summarizes the extent to which the present study's hypotheses were supported by the data. Each of the study's four hypotheses was tested with structural equation modeling via LISREL 8.54 (Joreskog & Sorbom, 2003). Because each of the constructs in the structural model was represented by single indicators, however, the method used may be more appropriately termed path analysis.

Correlations

All analyses within structural equation modeling are based upon the associations among all relevant study variables, represented as either a covariance matrix or as a correlation matrix with means and standard deviations entered separately. The correlation matrix of all study variables along with means and standard deviations is presented as table 2. Of note is the statistically significant association of wave 1 shyness with both wave 1 (r = -.40, p < .01) and wave 2 social acceptance (r = -.21, p < .05). Social acceptance showed modest stability across waves 1 and 2 (r = .40, p < .01), as did self-esteem across waves 2 and 3 (r = .61, p < .01). The only other statistically significant association was between mothers' and fathers' positive problem-solving (r = .21, p < .05) at wave 2.

Table 2

Correlation matrix for all measured variables across waves (N =231)

Variable

Variable	1	2	3	4	5	6	7
1. Child shyness (wave 1)	--						
2. Child social acceptance (wave 1)	-.44**	--					
3. Child social acceptance (wave 2)	-0.21*	0.40**	--				
4. Child self-esteem (wave 2)	.10	.08	.07	--			
5. Child self-esteem (wave 3)	-.09	.13	.10	.61**	--		
6. Mother's positive problem-solving (wave 2)	.00	-.01	-.08	-.01	-.11	--	
7. Father's positive problem solving (wave 2)	-.17	.16	.09	.06	.06	.21**	--

Notes: Values rounded to 2 decimal places. * = $p < .05$, ** = $p < .01$.

Ms = 2.47, 69.53, 70.26, 42.99, 42.99, 15.58, 15.57
SDs = 0.84, 11.59, 11.73, 6.78, 5.81, 1.85, 1.95

Results from Analyses

Evaluating path coefficients and model fit. In evaluating the magnitude of the relationships among relevant constructs, path coefficients corresponding to freed paths in LISREL's beta matrix were of particular interest. Because all LISREL output was standardized in the present analyses, these path coefficients may also be referred to as standardized beta coefficients. These values range from –1 to 1, with a value of zero indicating no systematic relationship. Like Pearson product-moment correlations, standardized beta coefficients of 1.0 and –1.0 indicated perfect associations, the former indicating a direct one-to-one relationship, and the latter representing a perfectly inverse

relationship. Because these coefficients are standardized, their value represents the amount of change in the predicted variable per unit change in the predictor variable.

Evaluating model fit is a slightly more complex exercise in that LISREL provides many different indicators, the most common of which is the chi-squared statistic. Low chi-squared values indicate that the specified model has accounted for the majority of the covariation present among relevant variables (Bandalos, 2002). In other words, a chi-squared value of zero indicates a perfect fit of the specified model to the true model that exists in the population. Improvements in fit that result from freeing paths of interest can also be tested for statistical significance using procedures outlined by Widamon (1985). Statistically significant improvements in fit that result from freely estimating paths representing hypothesized relationships provides support for the importance of that path. Therefore, as outlined in the previous chapter, a series of nested models in which hypothesized paths were freed one at a time was used to 1) obtain path coefficients for the hypothesized paths, and 2) assess the improvement in fit relative to more restrictive models.

In order to obtain a broader measure of model fit, Hu and Bentler (1998, 1999) have recommended using at least two additional indices of model fit. For sample sizes less than 250, like the present sample, these authors recommend the standardized root mean square residual (SRMR), which represents the square root of the average difference between the sample covariance matrix and the matrix implied by the specified model. Hu and Bentler (1998) have recommended a cutoff of .08 or less as an indication of good fit. Vandenberg and Lance (2000) have recommended the nonnormed fit index (NNFI; Tucker & Lewis, 1973) for two-group analyses in which measurement invariance is being

tested. This index, also called the Tucker-Lewis index (TLI), is the difference in fit of the target and baseline models compared to the difference in fit between the baseline model and one. As the target model's chi-squared value approaches its degrees of freedom, the numerator approaches the denominator, thus producing values near one (Bandalos, 2002). Hu and Bentler (1998, 1999) recommend a cutoff of .95 as an indication of good fit. The root mean square error of approximation (RMSEA; Steiger, 1990) has also been recommended by Hu and Bentler. The RMSEA represents the discrepancy per degree of freedom between the population data and the proposed model (Bandalos, 2002). Hu and Bentler (1998, 1999) recommend a cutoff close to .06, but Vandenberg and Lance (2000) have commented that values up to .08 may be accepted as indicating adequate fit. For the purposes of the present study, chi-squared, SRMR, NNFI, and RMSEA will all be used to assess measurement invariance across groups, but only chi-squared and RMSEA will be reported for all other models.

For all of the following models the error variance for all variables was set to $(\sigma^2)(1-\rho_{yy})$, where σ^2 represents the total variance of each variable and $(1-\rho_{yy})$ represents the proportion of variance that is measurement error. It should be noted that the measurement errors (residuals) were not allowed to correlate in each of the following models. This assumes that common sources of error, such as method bias or social desirability bias, do not exist among the measured variables. Social desirability bias is a common source of measurement error (Jaccard & Wan, 1996). Teachers at time 1 and 2, for example, may wish to characterize the students in their classrooms in a socially desirable fashion, and therefore report elevated levels of social acceptance. Students at times 2 and 3, furthermore, may not consider it socially desirable to report low levels of self-esteem.

Correlated measurement error has implications for the interpretation of the results that follow. Because residuals are assumed to be uncorrelated, the presence of correlated residuals will result in a poorer fit of the model to the data. Furthermore, common sources of residual variance across a predictor and the hypothesized outcome may inflate the strength of the association between these constructs. Caution has been taken in the present study to minimize method bias by having different reporters for predictor and outcome variables. Other sources of common residual variance, however, should be considered in the interpretation of the following results.

The following sections summarize the results relevant to each hypothesis.

Hypothesis 1

The first hypothesis asserted that time 1 shyness would be negatively associated with time 2 social acceptance over the transition to adolescence and would account for a significant residual decline in social acceptance from time 1 to time 2. As a point of comparison, a baseline model in which all causal paths were fixed to zero was tested and showed very poor fit χ^2 (10, N = 220) = 138.46, p = 0.00, RMSEA = 0.24). Freeing the path from time 1 shyness to time 2 social acceptance resulted in a statistically significant improvement in fit $\Delta\chi^2$ (1, N = 220) = 4.50, $p < .05$). Wave 1 shyness was a statistically significant predictor of wave 2 social acceptance ($B = -.23$, $t = -2.19$, $p < .05$). Results, therefore, provide initial support for the first hypothesis. The results for this model are shown in Figure 8. Only the freely estimated path is shown.

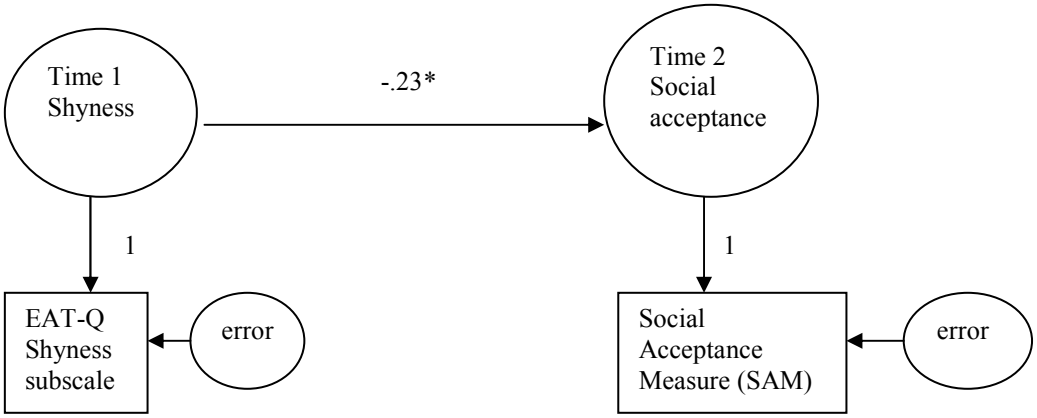


Figure 8. Results of freeing the path from time 1 shyness to time 2 social acceptance (p<.05).*

In order to test the extent to which time 1 shyness accounted for residual variance in time 2 social acceptance, the path from time 1 social acceptance to time 2 social acceptance was also freely estimated in a second nested model. Freeing this path resulted in a statistically significant improvement in fit over the baseline model $\Delta\chi^2$ (2, N = 220) = 18.55, $p < .05$). However, when compared to a model in which only the path from time 1 social acceptance to time 2 social acceptance was freely estimated χ^2 (9, N = 220) = 119.99, p = 0.00, RMSEA = .24), freeing the path from time 1 shyness to time 2 social acceptance did not improve the fit of the model $\Delta\chi^2$ (1, N = 220) = 0.08, $p > .05$). Time 1 shyness did not account for a statistically significant amount of residual variance in time 2 social acceptance ($B = -.03$, $t = -0.32$, $p > .05$) when the influence of time 1 social acceptance ($B = .43$, $t = 4.33$, $p < .05$) was taken into account. Therefore, the second part of the first hypothesis was not supported. A significant proportion of the variance in time 2 social acceptance was accounted for by time 1 social acceptance, and time 1 shyness

did not account for a significant amount of the residual variance in time 2 social acceptance.

Because the contemporaneous relationship of shyness and social acceptance has been documented by other studies (e.g. Rubin, 1993; Spence et al., 1999), their covariance at wave 1 was also freely estimated. As compared to the fit of the previous model in which only the paths from time 1 shyness and social acceptance to time 2 social acceptance were freely estimated χ^2 (8, N = 220) = 119.91, p = 0.00, RMSEA = 025), freeing this covariance resulted in a statistically significant improvement in fit $\Delta\chi^2$ (1, N = 220) = 37.49, $p < .05$). The result of freely estimating the wave 1 covariance of shyness and social acceptance (ψ= -.48, t = -5.33, p < .05) sheds insight on the inability of time 1 shyness to account for significant residual variance in time 2 social acceptance (B = -.01, t = -0.07, $p > .05$). Children who are shy at wave 1 are already experiencing significantly low levels of social acceptance. Therefore, these results indicate that shyness was a significant risk factor for low social acceptance at wave 1, but did not account for significant residual variance in social acceptance from time 1 to time 2. It is important to remember that when only time 1 shyness and time 2 social acceptance were examined, time 1 shyness was a statistically significant predictor of time 2 social acceptance (B = -.23, t = -2.19, $p < .05$). It is also noteworthy that the same teacher provided information about both shyness and social acceptance at time 1. Therefore, the covariance of these two variables at time 1 may be inflated due to method bias. Figure 9 shows the results freely estimating all paths related to the first hypothesis.

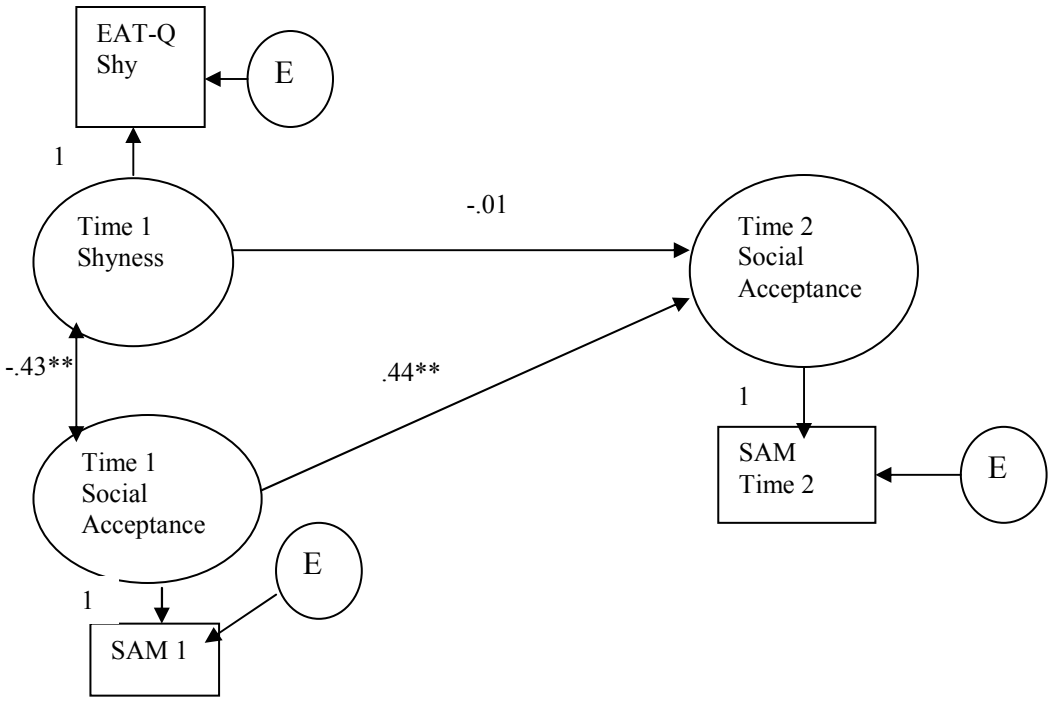


Figure 9. Results of freely estimating all paths related to the first hypothesis (p<.05).*

Hypothesis 2

The second hypothesis asserted that time 1 shyness will be negatively associated with time 3 self-esteem and will account for a significant amount of residual variance in time 3 self-esteem after the influence of time 2 self-esteem is taken into account. As with the first hypothesis, the fit a model in which the path from time 1 shyness to time 3 self-esteem was freely estimated χ^2 (9, N = 220) = 137.27, p = 0.00, RMSEA = 0.26 was compared to a baseline model χ^2 (10, N = 220) = 138.46, p = 0.00, RMSEA = 0.24 in which all causal paths were fixed to zero. Freeing the path from time 1 shyness to time 3 self-esteem did not result in a statistically significant improvement in fit $\Delta\chi^2$ (1, N = 220) = 1.19, $p > .05$). Wave 1 shyness was not associated with wave 3 self-esteem ($B = -.11$, t

= -1.08, $p > .05$). These results are shown in Figure 10. Again, although all five variables were included in the model, only the freely estimated path is shown in Figure 10.

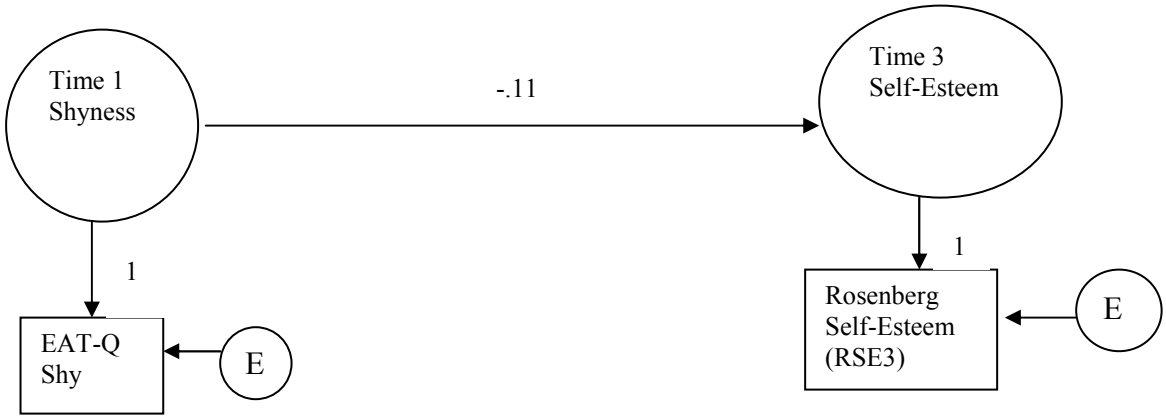


Figure 10. Result of freeing the path from time 1 shyness to time 3 self-esteem.

In order to test the extent to which time 1 shyness accounted for residual variance in time 3 self-esteem, the path from time 2 self-esteem to time 3 self-esteem was also freely estimated in a second nested model. Freeing this path resulted in a statistically significant improvement in fit over the baseline model $\Delta\chi^2$ (2, N = 220) = 18.55, $p < .05$). When compared to a model in which only the path from time 2 self-esteem to time 3 self-esteem was freely estimated χ^2 (9, N = 220) = 64.96, p = 0.00, RMSEA = .17), freeing the path from time 1 shyness to time 3 self-esteem resulted in a statistically significant improvement in fit $\Delta\chi^2$ (1, N = 220) = 4.26, $p < .05$). Time 1 shyness did account for a statistically significant amount of residual variance in time 3 self-esteem (B = -.17, t = -2.08, $p < .05$) when the influence of time 2 self-esteem (B = .76, t = 10.12, $p < .05$) was taken into account. Therefore, the second part of the second hypothesis was supported. A

significant proportion of the residual variance in time 3 self-esteem was accounted for by time 1 shyness, even after the influence of time 2 self-esteem was taken into account.

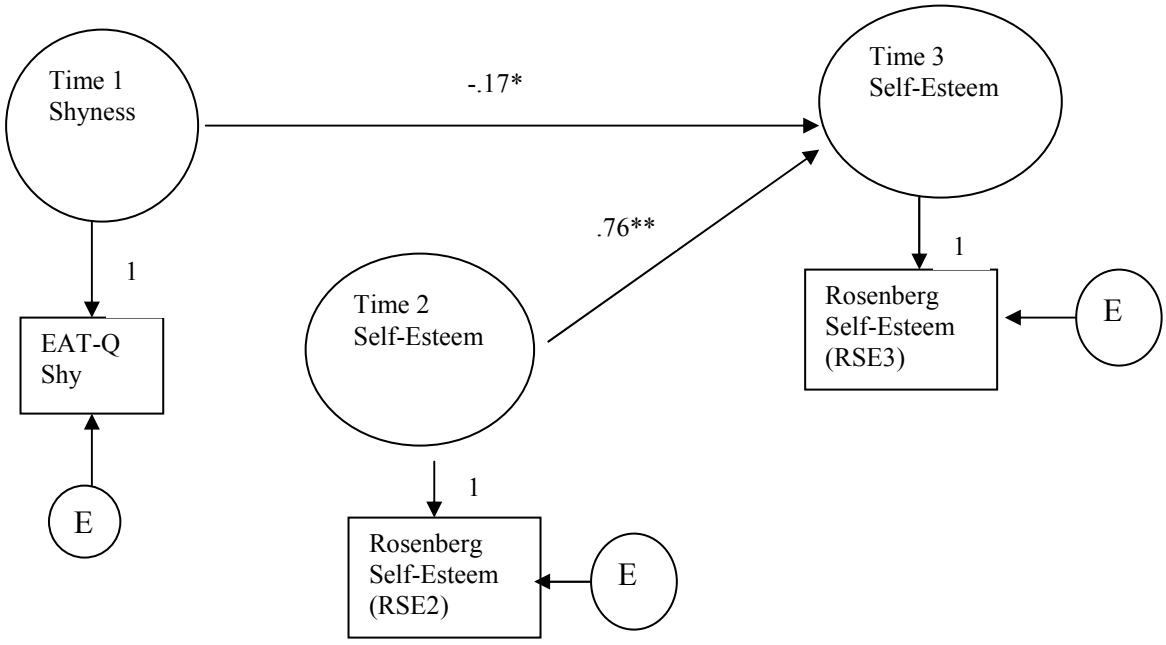


Figure 11. Results of freely estimating all paths related to the second hypothesis (p<.05).*

Hypothesis 3

The third hypothesis asserted that time 2 social acceptance would mediate the association between time 1 shyness and time 3 self-esteem. Specifically, the indirect paths from shyness to social acceptance, and social acceptance to self-esteem were expected to account for a significant proportion of the total effect of time 1 shyness on time 3 self-esteem. Because testing mediation via multiple regression requires one to assume the absence of measurement error in the mediator (Baron & Kenny, 1986), these authors recommend using structural equation modeling when testing mediational models. Therefore, the examination of relevant structural paths via LISREL 8.54 was used for the present analyses.

Using the Kenny et al. (1998) guidelines, the first step in testing for mediation was to assess the effect of time 1 shyness on time 3 self-esteem. As reported in the results for the second hypothesis, the fit a model in which the path from time 1 shyness to time 3 self-esteem was freely estimated χ^2 (9, N = 220) = 137.27, p = 0.00, RMSEA = 0.26 did not result in a significant improvement in fit $\Delta\chi^2$ (1, N = 220) = 1.19, $p > .05$) when compared to a baseline model χ^2 (10, N = 220) = 138.46, p = 0.00, RMSEA = 0.24 in which all causal paths were fixed to zero. Wave 1 shyness was not associated with wave 3 self-esteem ($B = -.11$, $t = -1.08$, $p > .05$). Therefore, results from the first step of the test for mediation failed to meet Kenny and colleagues' (1998) requirement that shyness show a statistically significant association with the outcome variable, self-esteem.

Although the data fail to support social acceptance as mediating the relationship between shyness and self-esteem, a further examination of interrelationships among these variables is informative. When compared to the fit a model in which only the path from time 1 shyness to time 3 self-esteem was freely estimated χ^2 (9, N = 220) = 137.27, p = 0.00, RMSEA = 0.26, also freeing the path from time 1 shyness to time 2 social acceptance resulted in a statistically significant improvement in fit $\Delta\chi^2$ (1, N = 220) = 4.74, $p < .05$), a result that supports the importance of this relationship ($B = -.24$, $t = -2.27$, $p < .05$). Also freeing the path from time 2 social acceptance to time 3 self-esteem, however, did not result in a further improvement in fit $\Delta\chi^2$ (1, N = 220) = 1.03, $p > .05$) over a model in which only the paths from shyness to both social acceptance and self-esteem were freely estimated χ^2 (8, N = 220) = 132.53, p = 0.00, RMSEA = 0.27. Time 2 social acceptance was not a statistically significant predictor of wave 3 self-esteem ($B = .12$, $t = 1.06$, $p > .05$).

As stated previously, the data do not support time 2 social acceptance as a mediator of the relationship between time 1 shyness and time 3 self-esteem. Consideration of the improvement in fit when social acceptance is included in a model containing shyness and self-esteem, however, suggests the importance of this construct in the association of shyness and self-esteem over time. The model in which social acceptance was included as a potential mediator between shyness and self-esteem showed a marginally significant improvement in fit $\Delta\chi^2$ (2, N = 220) = 5.77, $p < .06$) over the model in which only the path from shyness to self-esteem was freely estimated. It should be noted that the improvement in fit was mainly due to the strength of the association between shyness and social acceptance. The path coefficient from social acceptance to self-esteem, however, was positive ($B = .12$, $t = 1.06$, $p > .05$), as predicted. Although the p-value associated with this relationship indicates statistical non-significance, Cohen (1990) has argued against the "arbitrary unreasonable tyranny" (p. 1307) of the .05 significance level. The actual p-value associated with the social acceptance-self-esteem relationship is .14, which indicates that there is only a 14% chance that the relationship between the observed variables could have occurred by chance. This does not suggest that one consider the relationship between social acceptance and self-esteem as unimportant.

It is also informative to assess the indirect effects of time 1 shyness on time 3 self-esteem with time 2 social acceptance considered as a potential mediator. Using Figure 12 as a reference, the indirect effect is computed by multiplying the standardized path coefficient for path a (-.24) by the standardized path coefficient for path b (.12). The indirect effect, therefore equals - .029. The total effect of X on Y is found by adding the

direct effect (c') of shyness on self-esteem (-.09) to the indirect effect of shyness on self-esteem (.029) (Bollen, 1989), which results in a total effect that equals -.119. Because the units are standardized, this means that a one unit increase in shyness was associated with a decrease in self-esteem equal to approximately .119 units.

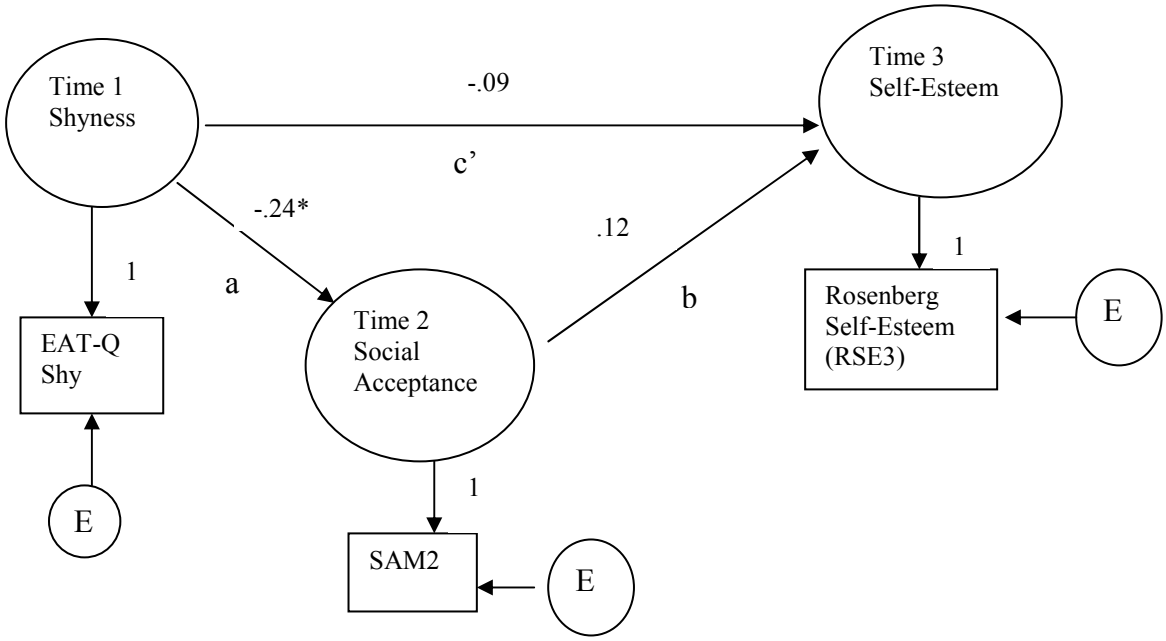


Figure 12. Model with all paths freely estimated. The path c' represents the direct effect of shyness on self-esteem. The product of paths a and b represents the indirect effect of shyness on self-esteem. (p<.05).*

In sum, although social acceptance was not supported as a mediator of the relationship between shyness and self-esteem, two factors suggest that social acceptance does play a role in the effects of shyness on self-esteem. First, a model in which the indirect paths from 1) shyness to social acceptance and 2) social acceptance to self-esteem were freely estimated in addition to the direct path from shyness to self-esteem showed a marginally significant improvement in fit $\Delta\chi^2$ (2, N = 220) = 5.77, $p < .06$) over

a model in which only the direct effect of shyness on self-esteem was considered. Second, a small indirect effect. (B = .029) does emerge when one considers the indirect path from time 1 shyness to time 3 self-esteem through time 2 social acceptance.

Hypothesis 4

The fourth hypothesis asserted that the tendency for shyness to predict decreases in social acceptance and self-esteem would be moderated by parents' positive problem-solving such that high levels of problem-solving would be associated with increased social acceptance and self-esteem. As discussed earlier, a median split on mothers' and fathers' positive problem-solving scores was used to create high and low problem-solving groups. Allowing the associations between shyness and both social acceptance and self-esteem to vary across high and low problem-solving groups was expected to result in a statistically significant improvement in fit over a model in which this relationship was specified as invariant across groups.

Tests of measurement invariance. As discussed earlier, measurement invariance is an important step in that one may receive empirical support that one is measuring the same attributes across groups (Horn & McArdle, 1992). Tests of measurement invariance were conducted in the present study for mothers versus fathers, and also for low versus high problem-solving groups for each parent.

Tests of measurement invariance require the testing of a two-group model in which factor loadings for like items are constrained to be equal across groups (Horn & McArdle, 1992). The model used to test for metric invariance across mothers and fathers included mothers' and fathers' problem solving as latent variables, with three positive problem solving subscale items for each parent loading freely on each parent variable,

and the first item given a loading of 1.0. As discussed earlier, the residuals in the theta epsilon matrix were constrained to be equal across identical items to test for equal item loadings across fathers and mothers, and the error variance for each item was freely estimated. Latent variable residuals and variances were also freely estimated across groups.

In the measurement model containing mothers and fathers, the fit was adequate χ^2 (15, N = 168) = 30.80, p = .009, RMSEA = 0.083, SRMR = .055, NNFI = .88. The RMSEA and the NNFI are borderline values that are a little outside of the recommended cutoff values of .08 and .90 respectively (Vandenberg & Lance, 2000). This suggests that factor loadings may differ somewhat across mothers and fathers, but the SRMR falls within even the strict guidelines of Hu and Bentler (1998, 1999), which include values of less than .08 as indicative of good fit. Analyses, therefore, proceeded with caution.

The measurement model containing high and low problem-solving groups for fathers was tested with the same procedure that was used for mothers and fathers. The two-group analysis indicated that the fit was adequate χ^2 (51, N = 168) = 74.33, p = .018, RMSEA = 0.064, SRMR = .11, NNFI = .78. The values for NNFI and SRMR suggest some problems with fit across low and high problem-solving groups, but the RMSEA value is in the acceptable range (Vandenberg & Lance, 2000). Therefore, as with mothers and fathers, analyses proceeded with caution.

The final measurement model tested for invariance across high and low problem-solving groups for mothers. The two-group analysis indicated excellent fit across groups χ^2 (51, N = 168) = 41.55, p = .89, RMSEA = 0.033, SRMR = .09, NNFI = 1.0. The value of the SRMR is the only cause for concern, but it is still within acceptable guidelines

(Vandenberg & Lance, 2000). Given the preceding results, tests of moderation were conducted with at least moderate confidence that the measures were operating in the same general fashion across mothers and fathers, and also across high and low problem-solving groups.

Tests of moderation for shyness-social acceptance relationship. A two-group analysis was performed for both mothers and fathers using LISREL 8.54 (Joreskog & Sorbom, 2003). A series of nested two-group models was used to test parents' positive problem solving as a moderator of the paths of interest by following the steps outlined in the previous chapter: 1) freeing the paths of interest one at a time in the first of two groups, 2) testing a baseline model in which all paths are held invariant across high and low problem-solving groups, and 3) freeing the path across groups to assess the improvement in fit. Statistically significant improvements in fit provided evidence that parents' problem solving moderated the association of interest. Factor loadings, measurement error, and factor variances were freely estimated in the first group and held invariant in the second group for all models.

Results for fathers. The first pair of models tested the extent to which fathers' problem-solving moderated the negative association (B = -.23, t = -2.19, $p < .05$) between wave 1 shyness and wave 2 social acceptance. To establish a baseline model for social acceptance, the path from shyness to social acceptance was freely estimated in the first group, but specified as invariant across both low and high positive problem-solving groups. The invariance model for fathers, in which all parameter estimates were constrained to be equal across groups, showed poor fit χ^2 (19, N = 168) = 116.04, p = 0.00, RMSEA = 0.25. Freeing the path from shyness to social acceptance across fathers'

problem-solving groups resulted in a slight improvement in fit χ^2 (18, N = 168) = 115.56, p = 0.00, RMSEA = 0.26, but the difference in chi-squared values was not statistically significant $\Delta\chi^2$ (1, N = 173) = 0.48, $p > .05$).

Results for mothers. The constrained model for mothers showed poor fit χ^2 (19, N = 168) = 130.18, p = 0.00, RMSEA = 0.26. Freeing the path from shyness to social acceptance across mothers' problem-solving groups resulted in a moderate improvement in fit χ^2 (18, N = 168) = 127.45, p = 0.00, RMSEA = 0.27, but the difference in chi-squared values was only marginally significant $\Delta\chi^2$ (1, N = 168) = 2.73, $p < .10$). Youth whose mothers were low in problem solving showed a statistically significant negative association (B = -.15, t = -2.69, $p < .05$) between shyness and social acceptance, but shyness and social acceptance were not associated (B = -.02, t = -0.37, $p > .05$) among youth whose mothers were high in problem solving. These results are illustrated in Figure 13. Because only the path from shyness to social acceptance has been freed, the fit is poor for both models shown.

Jaccard and Wan (1996) suggest using the difference in unstandardized path coefficients as an indication of effect size. The unstandardized path coefficient associated with the relationship of shyness to social acceptance for youth with low problem-solving mothers (B = -0.41, t = -2.69, $p < .05$) was 0.35 units lower than the corresponding coefficient associated with this relationship for youth with high problem-solving mothers (B = -0.06, t = -0.37, $p > .05$).

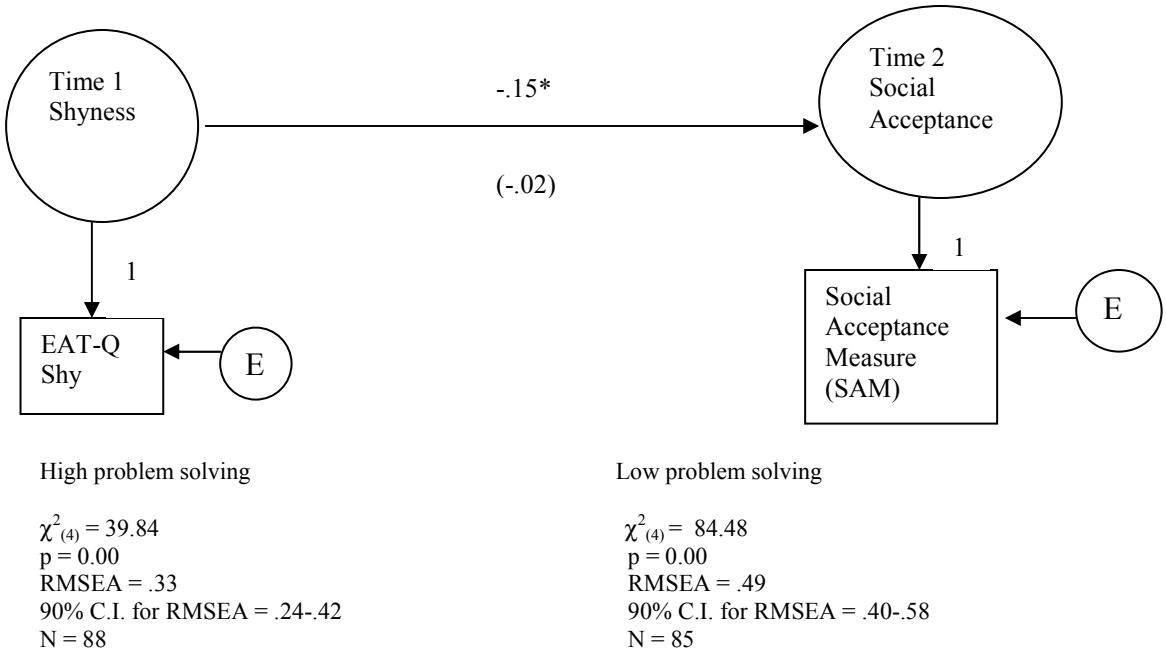


Figure 13. Standardized maximum likelihood estimates of the effects of shyness on social acceptance, by parents' problem-solving group. The coefficient for youth with high problem-solving mothers is shown in parentheses. The coefficient for youth with low problem-solving mothers is above the arrow (p<.05).*

Moderation of residual gain scores. The second set of analyses examined the extent to which parents' problem-solving moderated the association of time 1 shyness with time 2 social acceptance (B = -.01, t = -0.07, p > .05) with the influence of time 1 social acceptance (B = .44, t = 3.75, p < .05) taken into account. This involved freeing two additional paths in the first group: 1) The path from time 1 social acceptance to time 2 social acceptance, and 2) the covariance of shyness and social acceptance at time 1. Although the longitudinal relationship of shyness and social acceptance was of primary importance, the wave 1 covariance of shyness and social acceptance was freely estimated in the first group to improve model fit. A baseline model was assessed in which all paths

were specified as invariant across groups. This was compared to a second model in which the path from time 1 shyness to time social acceptance was freed across groups.

Results for fathers. The constrained (baseline) model for fathers showed poor fit χ^2 (17, N = 168) = 73.45, p = 0.00, RMSEA = 0.20. Freeing the path from time 1 shyness to time 2 social acceptance across fathers' problem-solving groups did not significantly improve the fit of the model $\Delta\chi^2$ (1, N = 168) = 0.30, $p > .05$).

Results for mothers. The constrained model for mothers showed poor fit χ^2 (17, N = 168) = 81.79, p = 0.00, RMSEA = .21. Freeing the path from shyness to social acceptance across mothers' problem-solving groups resulted in a slight improvement in fit χ^2 (15, N = 168) = 80.33, p = .90, RMSEA = 0.0, but the difference in chi-squared values did not reach statistical significance $\Delta\chi^2$ (1, N = 168) = 1.46, $p > .05$).

In general, the results failed to support parents' positive problem solving as a moderator of the relationship between time 1 shyness and time 2 social acceptance. The only relationship that approached statistical significance was the ability of mothers' positive problem solving to moderate the direct association between time 1 shyness and time 2 social acceptance $\Delta\chi^2$ (1, N = 168) = 2.73, p < .10). Although the association between shyness and social acceptance was negative and statistically significant for children of low problem-solving mothers ($B = -.15$, $t = -2.69$, $p < .05$), the association was not significant for children of low problem-solving mothers ($B = -.02$, $t = -0.37$, $p > .05$).

Tests of moderation for shyness-self-esteem relationship. Parents' positive problem solving as a moderator of the relationship between time 1 shyness and time 3 self-esteem ($B = -.11$, $t = -1.08$, $p > .05$) was also tested. The previously freed paths

involving social acceptance continued to be freely estimated in the first group. The fit of the baseline model, therefore, continued to improve as additional paths involving self-esteem were freed. Factor loadings, measurement error, and factor variances continued to be freely estimated in the first group and held invariant in the second group for all models.

Results for fathers. Freeing the path from time 1 shyness to time 3 social acceptance in addition to previous paths, then specifying all paths as invariant across groups resulted in poor fit χ^2 (16, N = 168) = 70.51, p = 0.00, RMSEA = 0.20. Freeing the path from time 1 shyness to time 3 self-esteem across fathers' problem-solving groups resulted in a negligible improvement in fit $\Delta\chi^2$ (1, N = 168) = 0.08, $p > .05$).

Results for mothers. The constrained model for mothers showed good fit χ^2 (4, N = 168) = 78.80, p = 0.00, RMSEA = .21. Freeing the path from time 1 shyness to time 3 self-esteem across mothers' problem-solving groups resulted in a slight improvement in fit $\Delta\chi^2$ (1, N = 168) = 1.96, $p > .05$).

Moderation of residual gain scores for self-esteem. The final path to be freed in the first group was from time 2 self-esteem to time 3 self-esteem. This was done in order to test the ability of parents' positive problem solving to moderate the statistically significant association between time 1 shyness and time 3 self-esteem (B = -.17, t = -2.10, $p < .05$) when the influence of time 2 self-esteem taken into account.

Results for fathers. The constrained three-variable model for fathers showed good fit χ^2 (15, N = 168) = 14.07, p = 0.00, RMSEA = 0.0. Freeing the path from time 1 shyness to time 3 self-esteem resulted in approximately the same fit $\Delta\chi^2$ (1, N = 168) = 0.01, $p > .05$).

Results for mothers. The constrained three-variable model for mothers showed adequate fit χ^2 (15, N = 168) = 24.99, p = 0.05, RMSEA = 0.089. Freeing the path from time 1 shyness to time 3 self-esteem resulted in a negligible improvement in fit $\Delta\chi^2$ (1, N = 168) = 0.13, $p > .05$).

In sum, the results failed to support parents' positive problem solving as a moderator of the relationship between time 1 shyness and time 3 self-esteem. This was true for the direct association of time 1 shyness and time 3 self-esteem, and also cases in which time 2 self-esteem served as a control variable. The fourth hypothesis, therefore, was completely unsupported by the data with respect to the relationship between shyness and self-esteem. Possible reasons for this lack of support is discussed in the final chapter.

Exploratory Analyses – Shyness and Social Acceptance

The final set of results concerns the moderating influence of different possible combinations of mothers' and fathers' positive problem solving. As stated in the preceding chapter, the empirical and theoretical foundation for such analyses is limited, so no hypotheses were proposed. Furthermore, because only the variables of interest were selected for each model, the degrees of freedom to test each model is much lower for these analyses, which results in weaker tests of the modeled relationships. Therefore, results from these analyses should be viewed as preliminary.

The results of the analyses involving shyness and social acceptance are summarized first, followed by the results for shyness and self-esteem. The relationship of time 1 shyness to time 2 social acceptance was compared across the following groups: 1) High problem-solving fathers with high problem-solving wives versus high problem-solving fathers with low problem-solving wives, and 2) High problem-solving mothers

with high problem-solving husbands versus high problem-solving mothers with low problem-solving husbands.

High problem-solving fathers with mother varied. The model in which all parameters were held invariant across mothers' low and high problem solving showed good fit χ^2 (3, N = 87) = 7.79, p = .05, RMSEA = .020. Freeing the path from shyness to social acceptance across mothers' problem-solving groups did not improve the fit of the model $\Delta\chi^2$ (1, N = 87) = 0.45, $p > .05$).

When time 1 social acceptance was added as a control variable, the constrained model showed questionable fit χ^2 (6, N = 87) = 9.83, p = .13, RMSEA = .12. Freeing the path from shyness to social acceptance across mothers' problem-solving groups slightly improved the fit of the model $\Delta\chi^2$ (1, N = 87) = 1.64, p > .05), but failed to produce a statistically significant improvement in fit.

High problem-solving mothers with father varied. The model in which all parameters were held invariant across fathers' low and high problem solving showed good fit χ^2 (3, N = 86) = 3.20, p = .36, RMSEA = .041. Freeing the path from shyness to social acceptance across fathers' problem-solving groups did not improve the fit of the model $\Delta\chi^2$ (1, N = 86) = 0.27, $p > .05$).

When time 1 social acceptance was added as a control variable, the constrained model showed good fit χ^2 (6, N = 86) = 4.58, p = .60, RMSEA = 0.0. Freeing the path from shyness to social acceptance across fathers' problem-solving groups did not improve the fit of the model $\Delta\chi^2$ (1, N = 86) = 0.29, $p > .05$).

Exploratory Analyses – Shyness and Self-Esteem

A similar set of analyses was done with time 3 self-esteem as the outcome variable. The relationship of time 1 shyness to time 3 self-esteem was compared across the same groups as were used in the preceding analyses: 1) High problem-solving fathers with high problem-solving wives versus high problem-solving fathers with low problem-solving wives, and 2) High problem-solving mothers with high problem-solving husbands versus high problem-solving mothers with low problem-solving husbands.

High problem-solving fathers with mother varied. The model in which all parameters were held invariant across mothers' low and high problem solving showed questionable fit χ^2 (3, N = 86) = 6.47, p = .091, RMSEA = .17. Freeing the path from shyness to self-esteem across mothers' problem-solving groups resulted in an improvement in the fit of the model $\Delta\chi^2$ (1, N = 87) = 3.59, $p < .06$) that approached statistical significance. Using the unstandardized path coefficients suggested by Jaccard and Wan (1996), the relationship of shyness to self-esteem in the high father-high mother condition (B = -1.47, t = -1.31, $p < .10$), differed greatly from this relationship in the high father-low mother condition (B = 1.91, t = 1.38, $p < .10$), a difference of 3.38 units. In sum, when both fathers and mothers were high in positive problem solving, the association between shyness and self-esteem was marginally significant and negative, but when fathers were high in problem solving and mothers were low, the association between shyness and self-esteem was marginally significant and positive. These results are shown in Figure 14 using standardized path coefficients for ease of interpretation. For youth with high problem solving fathers and low problem solving mothers, for example, a one-unit increase in shyness resulted in an increase of .33 units in self-esteem. For

youth with high problem solving fathers and high problem solving mothers, in contrast, a one-unit increase in shyness resulted in a decrease of .26 units in self-esteem.

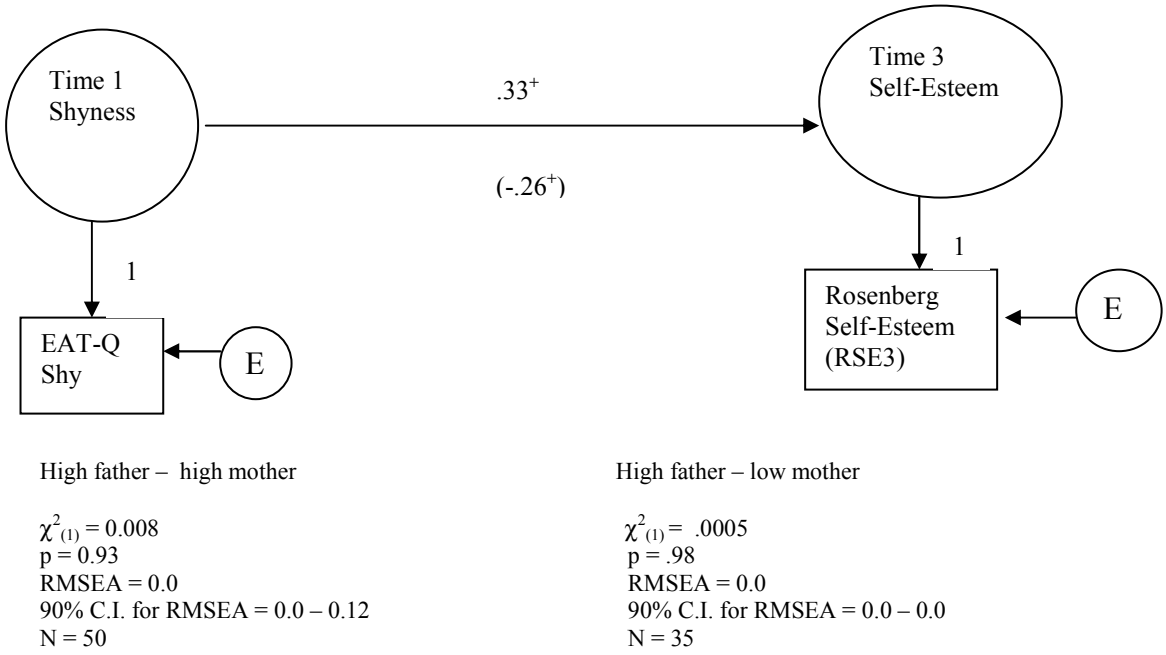
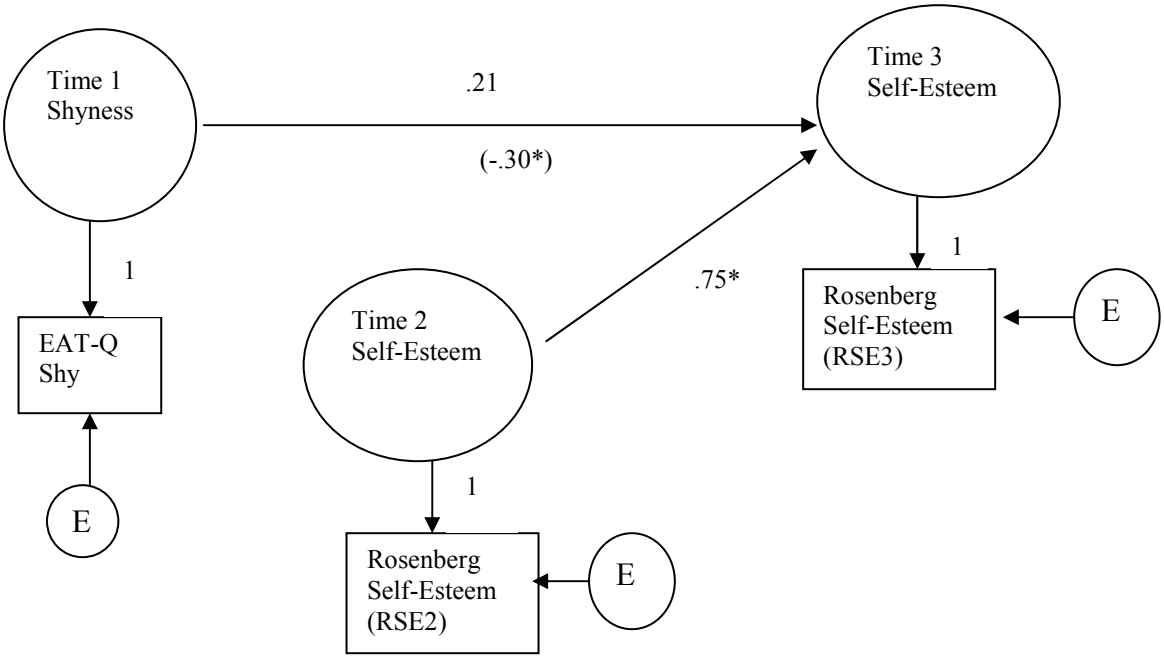


*Figure 14. Standardized maximum likelihood estimates of the effects of shyness on self-esteem, by parents' problem-solving group. The path coefficient for youth with both high problem-solving mothers and fathers is shown in parentheses. The path coefficient for youth with high problem-solving fathers and low problem-solving mothers is above the arrow. $^{+}$ $p < .10$, marginally significant. * $p < .05$.*

When time 2 self-esteem was added as a control variable, the constrained model showed good fit χ^2 (7, N = 87) = 8.68, p = .28, RMSEA = .076. Freeing the path from shyness to self-esteem across mothers' problem-solving groups resulted in a trend toward significance in improved fit $\Delta\chi^2$ (1, N = 87) = 2.85, p < .10). Using unstandardized path coefficients, the relationship of shyness to self-esteem in the high father-high mother condition (B = -1.84, t = -1.86, $p < .05$) differed greatly from this relationship in the high father-low mother condition (B = 1.28, t = .0.99, $p > .05$), a difference of 3.12 units. In sum, when both fathers and mothers were high in positive problem solving, time 1

shyness was negatively associated with self-esteem from time 2 to time 3, but was positively associated with self-esteem in the high father-low mother condition. These results are shown in Figure 15 using standardized path coefficients.



High father – high mother

$\chi^2_{(1)} = 0.30$
p = 0.58
RMSEA = 0.0
90% C.I. for RMSEA = 0.0-0.31
N = 50

High father – low mother

$\chi^2_{(1)} = 3.49$
p = .06
RMSEA = 0.027
90% C.I. for RMSEA = 0.0-0.60
N = 35

*Figure 15. Standardized maximum likelihood estimates of shyness as predictor of residual variance in self-esteem by parents' problem-solving group. The coefficient for youth with both high problem-solving mothers and fathers is shown in parentheses. The coefficient for youth with high problem-solving fathers and low problem-solving mothers is above the arrow. * p<.05 .*

High problem-solving mothers with father varied. The model in which all parameters were held invariant across fathers' low and high positive problem solving showed good fit χ^2 (3, N = 86) = 3.62, p = .31, RMSEA = .071. Freeing the path from shyness to self-esteem across fathers' problem-solving groups did not improve the fit of the model $\Delta\chi^2$ (1, N = 86) = 0.57, p > .05).

When time 2 self-esteem was added as a control variable, the constrained model showed good fit χ^2 (7, N = 86) = 8.45, p = .29, RMSEA = 0.071. Freeing the path from shyness to self-esteem across fathers' problem-solving groups did not improve the fit of the model $\Delta\chi^2$ (1, N = 86) = 0.30, p > .05).

Summary of exploratory analyses. The results of the exploratory analyses may be summarized with the following observations. First, analyses in which the relationship of shyness to social acceptance was compared across different combinations of parents' problem solving groups failed to reveal statistically significant differences between groups. Analyses with self-esteem as the outcome, however, showed a different pattern of results. Specifically, households in which both fathers and mothers were high in positive problem solving tended to foster a more *negative* association between shyness and self-esteem when compared to households in which only the father was high in positive problem solving. Models in which the path from shyness to self-esteem were freely estimated across mothers' high and low problem solving resulted in improvements in fit that approached statistical significance. These results suggest the pivotal role that mothers play in the socialization of their children. These differences will be discussed in the following chapter.

Summary of Overall Results

To summarize, results suggest a modest negative association between shyness and social acceptance, although shyness did not account for residual declines in social acceptance over time. The results do not support a direct association between time 1 shyness and self-esteem three years later, but shyness at time 1 did account for significant residual variance in time 3 self-esteem when the influence of time 2 self-esteem was taken into account. The relationship between time 1 shyness and time 3 self-esteem was not mediated by time 2 social acceptance, but nested goodness of fit tests suggested that social acceptance does play a small indirect role in the long-term relationship of shyness and self-esteem. Mothers', but not fathers' positive problem solving was a marginally significant moderator of the direct association between shyness and social acceptance. Both mothers' and fathers' problem solving, however, failed to moderate the relationship between shyness and self-esteem. Exploratory analyses indicated that youth who have both fathers and mothers who are high in positive problem solving experienced significant decreases in self-esteem, whereas moderate increases in self-esteem were noted in youth with only fathers who were high in positive problem solving. These results and their implications will be discussed in the following sections.

CHAPTER 5

DISCUSSION

The positive or negative evaluations that children receive from others become an increasingly important contributor to self-appraisals in late childhood and adolescence. Children can identify the extent to which they are accepted by peers and can evaluate their global self-worth as early as age 8 as developmental changes introduce the capacity to reflect upon other's evaluations of them. (Harter, 1999). The middle school years, furthermore, bring an increasing ability to simultaneously take both one's own perspective and the perspectives of others into account (Bruch, 1989; Harter, 1999).

The middle school years are also a time in which integration into social networks becomes increasingly important (Eccles et al., 1991). One particular group in which poor social integration may present an increased risk for low self-esteem is children with a shy temperament (Rubin & Krasnor, 1986). According to these authors, children who are shy may begin to suffer socially and psychologically in late childhood and early adolescence due to the increasing importance of peers' opinions and peer acceptance during these years. Children who are shy at age 10, for example, have also been found to experience low levels of social acceptance and self-worth (Fordham & Stevenson-Hinde, 1999). Younger and colleagues (2000), furthermore, have found a negative association between shyness and self-esteem in children ages 8 to 13.

The primary purposes of the present study were to 1) clarify the interrelationships among shyness, social acceptance, and self-esteem during the transition to adolescence,

and 2) determine the strength of parents' positive problem solving as a moderating variable in these relationships. Specifically, the present study sought to determine 1) the extent to which shyness contributes to social acceptance and self-esteem over the adolescent transition, 2) the extent to which social acceptance mediates the relationship between shyness and self-esteem, 3) the extent to which the relationship between shyness and social acceptance depends upon the amount of successful problem solving parents do with children, and 4) the extent to which the relationship between shyness and self-esteem depends on the amount of successful problem solving parents do with children.

Three waves of data were collected from adolescents aged 11 to 15 years, their parents, and a favorite teacher as part of the Adolescent Development Research Program (ADRP) at the University of Georgia between April 1994 and December 1997. These data were used to test the following four hypotheses.

1. Time 1 shyness will be negatively associated with time 2 social acceptance and will account for a significant decrease in social acceptance from time 1 to time 2.
2. Time 1 shyness will be negatively associated with time 3 self-esteem and will account for a significant decrease in self-esteem from time 2 to time 3.
3. Time 2 social acceptance will mediate the relationship between time 1 shyness and time 3 self-esteem.
4. The tendency for shyness to predict decreases in social acceptance and self-esteem will be moderated by parents' positive problem-solving at time 2 such that high levels of problem-solving will be associated with increased social acceptance and self-esteem.

The results from the present study provide several insights into the relationship of shyness to both social acceptance and self-esteem during early adolescence. The results suggest a modest negative association between shyness and social acceptance, although shyness did not account for residual variance in social acceptance from time 1 to time 2. The results also indicated a nonsignificant association between preadolescent shyness and self-esteem three years later. It is noteworthy, however, that preadolescent shyness at time 1 did predict a statistically significant decrease in self-esteem from time 2 to time 3, which corresponds approximately to the period from age 13 to age 15. Results from mediational analyses suggested that the relationship between time 1 shyness and time 3 self-esteem was not mediated by time 2 social acceptance by peers. Furthermore, tests of parents' positive problem solving as a moderator of the relationship between shyness and social acceptance failed to show statistically significant differences between problem-solving groups. This was also true for parents' problem solving as a moderator of the relationship between shyness and self-esteem. Results from exploratory analyses indicated that youth who have both fathers and mothers who are high in positive problem solving experienced significant decreases in self-esteem, whereas moderate increases in self-esteem were noted in youth with only fathers who were high in positive problem solving. These results and their implications will be discussed in the following sections.

Hypothesis 1

The results of the present study provided partial support for the first hypothesis. Time 1 shyness did show a significant negative association with time 2 social acceptance, but did not account for a significant decrease in social acceptance from time 1 to time 2. The former result is consistent with Fordham and Stevenson-Hinde (1999) and Rubin

(1993) who found shyness to be associated with low levels of peer acceptance at ages 10 and 11 respectively. The present study's results extend this finding to youth who were approximately age 12 at time 1 and age 13 at time 2.

Results from the preceding studies (Rubin, 1993; Fordham & Stevenson-Hinde, 1999) also provide insight into the inability of shyness to account for significant residual variance in social acceptance from time 1 to time 2. In both studies the levels of social acceptance among the shy children were already low at age 10 or 11. In the present study, furthermore, tendencies toward shy behavior were strongly associated with social acceptance at time 1, which corresponds to a mean age of 12. It is possible that there is a floor effect for social acceptance as early as age 10 to 12. Rubin and Krasnor (1986) have asserted that shyness may begin to have negative social consequences as early as age 8, which suggests that the steepest declines in social acceptance may actually occur from about age 8 to age 10. Further studies are needed to clarify this issue.

Hypothesis 2

The results of the present study also provided only partial support for the second hypothesis. Time 1 shyness was not associated with time 3 self-esteem. Time 1 shyness did account for a significant residual decrease in self-esteem from time 2 to time 3, however, as predicted. This finding supports the negative association found between shyness and self-esteem in children ages 7 to 14 years (Spence et al., 1999), and also is consonant with these authors' call for longitudinal studies to help untangle the direction of effects in studies involving shyness and other psychosocial variables.

The fact that shyness at time 1 (age 12) in the present study accounted for significant residual variance in self-esteem from time 2 (age 13) to time 3 (age 14-15)

may be partially explained by changes in developmental norms that occur between childhood and adolescence. Results for the first hypothesis suggested that youth who are shy tend to experience low levels of social acceptance during both the preadolescent and early adolescent years. The importance of social acceptance, as noted by Eccles and colleagues (1991), may peak around age 13, putting at risk those youth who fail to be accepted by their peers and rewarding those youth who succeed socially. Youth who have positive peer relationships in grade 7, for example, have been found to experience rising self-esteem from grade 7 to grade 10 (Deihl et al., 1997). Prior to these shifts in developmental norms concerning the importance of social acceptance, however, the association between shyness and self-esteem may not be as strong. Hymel and colleagues (1990), for example, found only small positive associations between grade 2 social acceptance and grade 5 self-esteem, and also between social acceptance and self-esteem in grade 5. In sum, the present study suggests that preadolescent shyness is a risk factor for poor social acceptance in early adolescence, and poor social acceptance during the critical early adolescent years is a risk factor for declines in self-esteem as children approach the high school years.

Hypothesis 3

The results of the present study did not provide support for the third hypothesis. The association between time 1 shyness and time 3 self-esteem could not be explained by the mediating influence of time 2 social acceptance. The total effect of shyness on self-esteem, however, did include a small indirect effect that primarily resulted from the statistically significant negative association of shyness with social acceptance.

Examining the links that comprise the indirect path from shyness to self-esteem may be informative in understanding the reasons underlying the poor mediating influence of social acceptance. The first indirect link required for mediation (Kenny et al., 1998) has been supported by multiple studies (e.g. Rubin et al., 1989; Rubin, 1993; Spence et al., 1999) that have found a strong negative association between shyness and social acceptance during late childhood and early adolescence. Indeed, this link was firmly established by the statistically significant negative association between shyness and social acceptance in the present study. The indirect link from social acceptance to self-esteem, however, was not supported in the present study. The association was positive, as expected, but was not statistically significant. Given the theoretical and empirical support for this link (Leary et al., 1995), the absence of significant findings is surprising. According to sociometer theory (Leary et al., 1995), a self-esteem system exists within each individual that is especially sensitive to drops in social acceptance. Leary's findings (Leary et al., 1995) support this theory, and others' findings (Deihl et al., 1997) suggest that this self-esteem system, or sociometer, may be operational by grade 7. Indeed, poor interpersonal relations with peers has been associated with poor self-esteem as early as grades 5 and 6 (Fenzel, 2000).

One possible reason for the weak association in the present study between time 2 social acceptance to time 3 self-esteem may be found in how these constructs were measured. It is important to remember that social acceptance was rated by youths' teachers and self-esteem was assessed by youths' self-report. The teachers reported the extent to which they believed students were liked by peers, reports that may mostly represent how popular youth were in the classroom setting. Youth whose primary social

contacts were outside the classroom setting may have been given undeservedly low ratings by teachers on social acceptance, and may have reported average or better self-esteem based on social acceptance by peers in contexts outside the classroom. If a broader measure of social acceptance had been captured by indicators in multiple contexts, the association between social acceptance and self-esteem may have been stronger, thus strengthening the link required for social acceptance to mediate the relationship between shyness and self-esteem.

The first link required for mediation, however, is the link between time 1 shyness and time 3 self-esteem (Kenny et al., 1998), a link that was not supported by the data in the present study. As reported, only a small negative association between shyness and self-esteem was found. This is surprising in light of the many studies (e.g. Strauss et al., 1986; Fordham & Stevenson-Hinde, 1999; Younger et al., 2000) that have supported the significant negative association of shyness and self-esteem in late childhood and early adolescence. The nonsignificant association between time 1 shyness and time 3 self-esteem does require an explanation.

It was noted in chapter 3 that the present sample cannot be characterized as a shy sample. Less than 15% of the youth had levels of shyness that were more than one standard deviation above the mean for shyness in the present study. Furthermore, the distribution of shyness scores was such that the mean score for shyness (2.47) represented about the halfway point between a response (3) indicating ambivalence (neither true nor false) and a response (2) indicating disagreement (mostly false) in response to statements indicative of shy behavior. Even at one standard deviation above the mean, the cutoff score (3.31) was closer to an ambivalent response of 3 than to a response (4) indicating

agreement (mostly true) to statements indicative of shy behavior. At the extreme of the distribution, only 5.7% of youth had mean scores of 4 or higher, suggesting that only a handful of youth may have experienced problematic levels of shyness. The youth in the previously mentioned studies (Strauss et al., 1986; Fordham & Stevenson-Hinde, 1999; Younger et al., 2000), in contrast, had either been nominated by classmates as socially withdrawn (Strauss et al., 1986), preselected as shy by multiple raters (Fordham & Stevenson-Hinde, 1999), or had also been rated as self-conscious and anxious (Younger et al., 2000). If the sample in the present study had been more similar to these samples in which large numbers of shy children were represented, a stronger association between shyness and social acceptance may have been found.

Hypothesis 4

Results from the present study did not support the fourth hypothesis. Positive problem solving by parents did not moderate the relationship of time 1 shyness to time 2 social acceptance, nor did it moderate the relationship of time 1 shyness to time 3 self-esteem. This was true for both fathers' and mothers' problem solving. The only exception was an effect that was marginally significant for mothers' problem solving moderating the relationship of time 1 shyness to time 2 social acceptance. Youth whose mothers were low in positive problem solving showed a significant negative association between shyness and social acceptance, but youth whose mothers were high in problem solving showed a much weaker negative association. None of the results, however, were statistically significant.

The absence of statistically significant results is not consistent with much of the literature on parental involvement and children's psychosocial outcomes. Roberts and

colleagues (2000) found parental involvement and support to predict both positive peer relationships and self-esteem in a preadolescent sample, and Dekovic and Meeus (1997) found maternal acceptance to predict similar outcomes in sample ranging from 12 to 18 years of age. Neither of these studies, however, focused specifically on parents' positive problem solving. It is possible that parental involvement, parental support, and maternal acceptance are all more effective than positive problem solving in promoting self-esteem during preadolescence and early adolescence. Furthermore, there is evidence that parents' problem-solving behaviors, such as reaching a consensus with youth concerning appropriate behavior, may be important in encouraging psychosocial maturity in later adolescence (Mantzicopoulos & Oh-Hwang, 1998). It would be informative, therefore, to test the moderating influence of parents' problem solving on social acceptance and self-esteem in an older sample of adolescents.

The failure of parents' problem solving as a moderator may also be due to the questionable internal consistency of the four-item positive problem solving subscale used to measure this construct. As mentioned in chapter 3, the internal consistency was .62 for father's report and .68 for mother's report of positive problem-solving. The poor internal consistency may be partly due to the limited number of items, but it may also reflect the inability of some items to contribute strongly to the overall problem-solving construct. In factor analyses for both mothers and fathers, for example, the item "How often do you consider child's feelings?" had a much lower loading (.47) on the overall construct than did the other three items. All other loadings were near 0.6 or better. Marsh and Hau (1999) have recommended 0.6 as a minimum acceptable loading. In sum, a more comprehensive and reliable measure of positive problem solving may have yielded

results that are more consistent with the current literature on parental involvement and children's psychosocial outcomes.

Exploratory Analyses

All of the children in the present study were living in two-parent households during the time of the study. The youth in the study, therefore, were influenced by simultaneous relationships with both their fathers and mothers. In light of this dual influence, it was important to explore the differences in psychosocial outcomes that might result from different combinations of fathers' and mothers' positive problem solving. Specifically, exploratory analyses sought to compare youth whose parents were both high in problem-solving with youth who had one parent who was low in problem-solving. This was essentially a test of whether one parent's problem solving moderated the spouse's problem-solving.

Results from these exploratory analyses indicated that youth who have both fathers and mothers who are high in positive problem solving showed a strong negative association between shyness and self-esteem, whereas a moderate positive relationship was noted in youth with only fathers who were high in positive problem solving. Although no hypotheses were proposed for the exploratory analyses, these results run contrary to the expectation that higher levels of problem solving would encourage greater self-esteem in youth with a tendency toward shy behavior. These results are especially puzzling in light of Deihl et al. (1997) who found positive family relationships to be associated with either consistently high or rising self-esteem in a longitudinal study from grade 6 to grade 10. Deihl et al. (1997), however, did not study shyness, which suggests

the possibility that positive parental involvement may have differential effects across temperament groups.

Another possible reason for the negative association between shyness and self-esteem in youth with high problem-solving parents may lie in the extent to which the problem-solving construct is similar to parental enmeshment with the child. In other words, the parents may be overly involved and are not respecting the youth's autonomy. Socially reticent children aged 8 to 12, for example, have reported home environments that fail to promote individuation and independence (Messer & Beidel, 1994), which are hallmarks of healthy adolescent development (e.g. Steinberg, 1990). During the adolescent years, parent-child *enmeshment*, which is the family-level analogue of psychological control (Barber & Harmon, 2002), may contribute to social withdrawal (Barber & Buehler, 1996) and other internalizing behaviors (Fauber, Forehand, Thomas, & Wierson, 1990). Fauber and colleagues found enmeshment to have the strongest effects on internalizing in two-parent families, which is notable considering the present sample's inclusion of only two-parent families. In sum, to the extent that parental involvement is insensitive to the child's attempts at autonomy, the child may become convinced that efforts at social exploration are fruitless, which may lead to poor psychological outcomes.

Parents who become enmeshed with their socially reticent child may also be motivated by a larger constellation of problems associated with the child's poor social development. Strauss et al. (1986), for example, found that 7- to 10-year-old children whose classmates had nominated them as withdrawn experienced higher levels of depression, submissiveness, and general anxiety than did outgoing students. Rubin and Mills (1988), furthermore, found withdrawn behavior during middle childhood to place a

child at risk for later anxiety, depression, and negative perceptions of his or her social competence. Parents, seeing their child's need for help, may respond difficulties with greater levels of involvement and problem solving. Their efforts, however, unless bolstered by other interventions, may be unable to counteract the drop in self-esteem that typically accompanies social difficulties.

Youth with high problem-solving fathers, but low problem-solving mothers, presented a much different picture when compared to youth with two parents who were high in problem solving. The latter group, as discussed, showed a significant negative association between shyness and self-esteem. The former group, in contrast, showed a non-significant positive association. Youth with high problem-solving mothers and low problem-solving fathers did not show a significant contrast when compared to youth with two high problem-solving parents. The high mother-low father youth showed a nonsignificant association between time 1 shyness and time 3 self-esteem for both the direct relationship ($B = .03$, $t = 0.11$, $p > .05$) and when time 2 self-esteem was considered as a covariate ($B = -.12$, $t = -0.57$, $p > .05$). These differences require an explanation.

One explanation may lie in the differences between mothers' and fathers' styles of problem solving. It is possible that ways in which fathers involve themselves with youth do not infringe on the youth's autonomy, whereas mothers may be more solicitous and restrictive (Rubin, Cheah, & Fox, 2001), thus limiting the child's social exploration. The literature on fathers' involvement with socially reticent children pales in comparison to literature on maternal involvement, but fathers have traditionally spent a majority of their time with children playing with them, whereas mothers are viewed as the primary

nurturers (Anderson & Sabatelli, 2003). Therefore, it is possible that mothers who provide more emotional space while their husbands engage in developmentally appropriate types of involvement may provide the necessary balance to promote the child's healthy psychological development. Fathers who follow their wives' lead in establishing an atmosphere of enmeshment, however, may augment the level of restriction placed on the child's autonomy. Future research is needed to shed additional light on these issues.

Limitations

Results from the present study provided multiple insights into the original questions with which the study began, and also suggested some new areas of study, such as the examination of different combinations of fathers' and mothers' parenting behaviors. There do, exist, however, several noteworthy limitations. These limitations include 1) the original purpose for which the data were collected, 2) the high percentage of missing data, 3) the questionable reliability of the measure of parents' positive problem solving, and 4) the absence of multiple indicators for each latent variable.

The data used in the present study were collected between 1994 and 1997 as part of a longitudinal study of family processes and alcohol use norms. Although child temperament and psychosocial outcomes were of interest when the original study was formulated, the primary purpose of the original study was "to assess family processes that are linked to changes in alcohol use and psychological functioning" (Brody & Ge, 2001, p. 84). Obtaining a sample that included a requisite number of children with problematic levels of shyness was not a goal of the original researchers. Social and psychological functioning was of interest to the original researchers, however, which allowed for the

inclusion of social acceptance and self-esteem in the present study. As noted earlier, however, one should keep in mind that the present sample consists primarily of youth with at least average levels of social initiative. When interpreting the results of the first hypothesis, for example, it may be more appropriate to conclude "youth with lower levels of social initiative tend to be less socially accepted" than to conclude "youth with higher levels of shyness tend to be less socially accepted." The latter statement may indeed be true, and many studies have supported it (e.g. Rubin & Krasnor, 1986; Rubin et al., 1989), but it seems inappropriate to talk about higher levels of shyness when one's sample contains very few youth who can be accurately characterized as shy.

Another limitation is the amount of missing data in the present study. Across all models, the percentage of missing data ranged from 13% to 26%. The full information maximum likelihood feature of LISREL 8.54 (Joreskog & Sorbom, 2003) was used to estimate values for those cells that have missing values. Although maximum likelihood procedures have been shown to provide clearly superior estimates when compared to other methods such as pairwise deletion, the possibility of bias remains (Graham, Hofer, & MacKinnon, 1996). Most of the missing data in the present study was due to the low percentage of teachers who returned surveys. Teacher data was very important for the purposes of the present study. Teachers provided reports of the child's shyness and social acceptance at time 1, and reports of the child's social acceptance at time 2. In the absence of a reliable procedure to impute missing values, sufficient power to detect the predicted relationships may not have been possible.

A third limitation to be discussed is the questionable reliability of the measure of parents' positive problem solving. As the reliability of a measure increases, the amount of

measurement error decreases, and one is able to be more confident that the instrument is measuring a cohesive construct. According to Baron and Kenny (1986), the general effect of poor reliability, which may be conceptualized as measurement error, is to weaken the true association between the variables of interest This may greatly compromise the power to detect the effects of intervening variables, especially when reliability is close to .70 or lower (Hoyle & Kenny, 1999). It is likely that the power of positive problem solving as a moderating variable in the present study was diminished by the low reliability for both father's report (alpha = .62) and mother's report (alpha = .68).

A final limitation to be discussed is the absence of multiple indicators for each latent construct. Each of the variables in the present study were measured with only one instrument. Having two or more indicators for each variable is one method through which measurement error, correlated measurement error, and other sources of bias can be incorporated into LISREL models (Baron & Kenny, 1986). According to Hoyle and Kenny (1999), having multiple indicators for a potential mediating variable can improve the reliability of the mediator to the extent that it is essentially 1.0. Multiple indicators, in essence, allow one to test relationships between latent variables without the clouded influence of measurement error, which leads to a clearer testing of hypotheses and theoretical propositions (Bollen, 1989). Therefore, although error was incorporated into the present study's models through reliability estimates, even greater confidence in the results could have been gained via multiple indicators for each construct.

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