

DISSERTATION

EXPLORING DIFFERENCES IN ADOLESCENTS' EDUCATIONAL
EXPECTATIONS: A STRUCTURAL EQUATION MODELING APPROACH

Submitted by

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Fall 2010

COLORADO STATE UNIVERSITY

August 13, 2010

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY VALERIE F. WOOD ENTITLED EXPLORING DIFFERENCES IN ADOLESCENTS' EDUCATIONAL EXPECTATIONS: A STRUCTURAL EQUATION MODELING APPROACH BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

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ABSTRACT OF DISSERTATION

EXPLORING DIFFERENCES IN ADOLESCENTS' EDUCATIONAL EXPECTATIONS: A STRUCTURAL EQUATION MODELING APPROACH

The current study examined a number of influences that are theorized to affect adolescents' educational expectations, including socio-economic status, perceived barriers to success, peer factors, family influences, school performance, and school adjustment. This study utilized a subset of pre-existing data, with the subset consisting of 76,218 students who completed the Community Drug and Alcohol Survey as part of a stratified random sample of junior high schools throughout the United States. The hypotheses were tested using structural equation modeling. The major findings were that Perceived Family SES was related to Resource Barriers, Resource Barriers was related to School Performance, Friends' School Adjustment was related to School Adjustment, Family Academic Support was related to School Adjustment, Friends' School Performance was related to School Performance, School Adjustment was related to School Performance, Family Academic Support was related to Educational Expectations, and School Performance was related to Educational Expectations. The measurement model results indicated that the latent construct of Perceived Barriers was more appropriately considered to be several distinct latent constructs. When this revision was taken into account, the measurement model achieved adequate fit (Robust NFI = .901, Robust CFI = .902). The structural equation model results found that the Perceived

Barrier items may have been interpreted differently by the students than intended, with minority students in particular interpreting those items differently. While the peer constructs operated as hypothesized, the structural model achieved a better fit when Family Academic Support rather than School Performance, was used as a predictor of School Adjustment. Overall, the proximal indicator of Educational Expectations in the current study was School Performance. The initial structural model achieved a fit of Robust NFI = .811, Robust CFI = .812, and the revised structural model achieved improved fit at a level of Robust NFI = .859, Robust CFI = .860. While the current study is limited by a number of factors, the results are in agreement with findings from previous literature, and indicate that School Performance may be more important to understanding adolescents' Educational Expectations than previously acknowledged.

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Chapter I: Introduction

Arguably, adolescence is one of the most important developmental stages of the lifespan. Adolescence is the bridge between the world of childhood dreams and adult realities, a time when people are no longer children but not yet adults. Developmentally, adolescence is a stage of significant biological changes, cognitive maturation, and identity formation. Interestingly, despite their cognitive immaturity, adolescents are faced with educational and career decisions that will affect them for the rest of their lives. Two dimensions seem particularly relevant to the career decision-making process for adolescents: educational expectations and career expectations. The purpose of this dissertation is to explore several factors that may differentiate adolescents with high educational expectations from those with low educational expectations. While the current study focuses on the nature of adolescents' educational expectations, limited research on career expectations is also discussed due to the intertwined nature of these two variables.

Gender Differences in Educational and Career Expectations

Previous research has documented significant differences in educational and career expectations by gender. For example, researchers have found that whereas adolescent girls often perceive fewer barriers to their career achievement (Hill, Ramirez, & Dumka, 2003; Reyes, Kobus, & Gillock, 1999; Rojewski & Hill, 1998), their career goals are less ambitious than those of their male counterparts (Reyes et al., 1999)

and their career goals are more likely to be geared towards “traditionally female occupations” (Armstrong & Crombie, 1999; Hill et al., 2003). In contrast, male adolescents tend to agree with traditional gender roles in which the man is the primary provider, that a spouse’s employment harms a marriage (Jackson & Tein, 1998), and to express a greater number of career goals (Hill et al., 2003). However, young men also feel that they lack the necessary information to make a career decision (Hill et al., 2003), perceive a larger number of external barriers to their career expectations, and are more likely to feel discouraged in pursuing their chosen career path (Rojewski & Hill, 1998).

Gender differences have also been found in the impact parental influence has on adolescents’ educational aspirations. Marjoribanks (1987) found that parents’ aspirations for their child affected female adolescents’ educational aspirations, but not male adolescents’ educational aspirations. When children were asked to list the most important influences on their educational and career choices, parents were listed as the most influential by 5th and 6th graders, and by adult children. In adolescence, however, other influences, such as peers were listed as more important (Peterson, Stivers, & Peters, 1986). Gender differences are further highlighted by the finding that high school freshmen and sophomores indicated that the same-sex parent had the most influence on their career expectations (Paa & McWhirter, 2000). This influence can be seen in the finding that adolescent girls who perceived their mother as having power within the family structure aspired to less stereotypically feminine careers (Lavine, 1982).

Gender differences have also been found in sources of support for making educational and career decisions. For example, Wall, Covell, and MacIntyre (1999) found that females utilized a wider web of social support, drawing on peers, family, and

teacher support when making their decisions. In comparison, males sought support solely from family members. When taken together with the other research findings discussed above, one can clearly see how important a strong male rolemodel becomes for male adolescents. Not only are young men more constricted in where they are turning for support compared to young women (Wall, Covell, & MacIntyre, 1999), they are also more influenced by the same-sex parent (Paa & McWhirter, 2000). This lack of social support options may contribute to the feeling of confusion that many young men report when faced with making an educational or career decision (Hill et al., 2003).

Overall, the pattern that emerges in the literature seems to be one in which young men express higher status career goals and more varied career goals, but feel that there are a number of barriers that may prevent them from reaching their goals, including a lack of information on the steps required to meet their goals. Young women show a clearer understanding of the requirements for reaching their career goals, but their goals are less ambitious and are more confined by their gender role. In addition, young women seem to be more open to parental influence, and draw from a larger support network, compared to their male counterparts. Both genders report being more influenced by the same-sex parent, with that influence being the strongest in middle school and adulthood. These findings point to the importance of including gender in the current analysis of educational expectations.

Differences in Educational and Career Expectations by Ethnicity

In addition to gender differences, differences between ethnic groups have been examined in the literature on educational and career expectations. In a qualitative study comparing career expectations of Euro-American, African-American, Mexican-

American, and Mexican immigrant 12 to 14 year-olds, Hill et al. (2003) found several trends in their qualitative data. The researchers found that Mexican-American and Mexican immigrant girls were more likely to mention traditionally female career goals compared to their female Euro-American and African-American peers. Hill et al. (2003) also found differences in perceived barriers. Specifically, Mexican-American and Mexican immigrant participants were significantly less likely to perceive barriers to their success, and when they did perceive barriers, they were of a financial nature. African-American and European-American teens were more likely to perceive barriers to reaching their career goals overall, and the most commonly mentioned barrier for these two groups was lack of family support.

In contrast to the results found by Hill et al. (2003), a study conducted by Reyes et al. (1999), found that 87% of the 10th grade Mexican-American girls in their sample aspired to non-traditional, male-dominated careers. Associated with this aspiration was a clear understanding of the steps necessary to fulfill that aspiration, the expectation of attending college, and the expectation of earning a high salary. The authors argue that for many Mexican-Americans, America is seen as the “land of opportunity” in which children are encouraged to surpass their parents in education and occupation. Perhaps it is this idealization of opportunities, in union with the strong “familismo” of Latino culture, which leads Mexican-American and Mexican immigrant youth to have a sense of family support for their educational and occupational expectations.

Unfortunately, other studies have found that Latino youth do not always feel as optimistic about their educational opportunities and future careers. For example, in one qualitative study with Latino youth, ages 11 to 16, the adolescents reported several

perceived barriers to attaining their aspirations. These included not understanding the steps necessary to achieve their goals, racism, and the effects of limited English proficiency (Behnke, Piercy, & Diversi, 2004). Both male and female Latino youth felt that they needed more information regarding the actual steps necessary to obtain the career they desired. Over half the students in this particular sample mentioned racism as a factor that may keep them from reaching their goals. Furthermore, a majority of these students struggled with written English, which interfered with their ability to score well on tests and homework, and contributed to a sense of isolation from their European-American peers (Behnke et al., 2004).

In a retrospective study investigating Latinas' family influences on their education and career paths, Gomez, Fassinger, Prosser, Cooke, Mejia, and Luna (2001) found that even while Latina women felt their families were a source of social support, and that support was influential in their decision-making process, they simultaneously felt conflicted when faced with a choice between prioritizing their careers and prioritizing their family life. At times, they also felt constrained to conform to the feminine gender role expectations of their families and cultural group. Thus, for Latinas, there seems to be a tension between pursuing educational and career success and adhering to family expectations.

Interestingly, a study conducted by St-Hilaire (2002) found that Mexican-American students' educational aspirations were significantly lower than the educational aspirations of their Mexican immigrant peers. While 90% of the 8th and 9th grade Mexican-American and Mexican immigrant students (median age: 14) in the sample agreed with the statement, "Education is the key to get ahead in this country," Mexican-American and

Mexican immigrant students who professed high academic aspirations also reported an increased frequency of discrimination. St-Hilaire (2002) interpreted these results as evidence of negative peer sanctions, in which students of Mexican heritage are being pressured to conform to a stereotype of low achievement and low aspirations.

One possible explanation for the contradictory findings regarding Latino youth and their educational and career expectations could be that their level of acculturation moderates their expectations. For example, for youth who are recent immigrants, their family may be encouraging them to take advantage of the educational opportunities in their new home country. However, at the same time a lack of proficiency in English could contribute to a sense of isolation, and create a barrier to completing the steps needed to reach their career goals. One study examined the effect of acculturation on Asian-American students, and found a positive relationship between acculturation and career self-efficacy (Tang, Fouad, & Smith, 1999). The more acculturated the students were the more confident they felt in their ability to make career related decisions. Perhaps a similar dynamic is at work for Latino and Latino-immigrant students in the U.S.

Interviews with African-Americans have found a number of factors that are influential in the realm of educational and career decision making, including a family emphasis on education and work, family support for achieving educational and career goals, gender role socialization, work values, and financial support (Chung, Baskin, & Case, 1999; Pearson & Bieschke, 2001). Of particular importance for African-Americans was role-modeling by the same-sex parent (Chung, Baskin, & Case, 1999). However, given the higher percentage of single-mother families of African-American descent,

young men may not have the advantage of paternal role-modeling in their family. This could explain why African-Americans were more likely to report a lack of family support as a barrier to their career expectations in the Hill et al. (2003) study.

In summary, results on differences in educational and career expectations by ethnic group have contradictory and inconclusive findings. It is clear from the literature on adolescence that ethnic identity plays an important role in shaping the emerging adult personality of teenagers. However, it is unclear exactly how the internalization of ethnic identity affects an individual's educational and career expectations. The current study addresses this issue by comparing the relationship of several variables to career expectations across African-American, European-American, and Hispanic-American youth.

Socio-Economic Status and Educational and Career Expectations

Previous research on adolescents' educational and career expectations has demonstrated that socio-economic status (SES) is a significant predictor of educational and career expectations (Owens, 1992; Rojewski & Kim, 2003; Rojewski & Yang, 1997; St-Hilaire, 2002; Trusty, 1998). For example, in their study on adolescents' occupational aspirations, Rojewski and Yang (1997) found that socio-economic status was the strongest predictor of teenagers' occupational aspirations. Similar results were reported by Trusty (1998), who found that in a national sample of US students, the most significant predictor of educational expectations was socio-economic status.

In later research, Rojewski and Kim (2003) found that SES was a defining factor of college-bound, work-bound, and unemployed youth, with two-thirds of all work-bound and unemployed youth being in the lowest two SES quartiles and two-thirds of all

college-bound youth being in the highest two SES quartiles. Owens (1992) found similar results in that work-bound or military-bound students in his sample came from larger families in the lower SES strata, and college-bound students in his sample came from smaller families in the higher SES strata. In their review of research on family influences of career development, Whiston and Keller (2004) found that SES status acts as a gateway to occupational choice, with individuals raised in lower SES families having restricted occupational expectations, and individuals raised in higher SES families having expanded occupational expectations.

While the above-cited studies were in agreement regarding the defining role of SES in predicting adolescent career expectations, few authors addressed the theoretical relationship between the two variables. This limitation was addressed by Lent, Brown, and Hackett (1996). Using the framework of social cognitive learning theory and a sociological perspective, the authors argued that cultural expectations and stereotypes related to socio-economic class influence adolescents' feelings of self-efficacy. To the extent that such cultural expectations enhance or detract from self-efficacy, adolescents may internalize a feeling of enhanced or restricted occupational choices. Thus, from this perspective, the effect of SES on educational and occupational expectations is mediated by cultural stereotypes related to SES.

Another explanation offered by Hill et al. (2003) was that SES influences occupational aspirations through parent-child relationships, such that the stress of low SES conditions leads to unsupportive or hostile parenting strategies. In their research, the authors found that adolescents with unsupportive parents were more likely to have unclear occupational goals, and more likely to perceive that there were barriers that

would prevent them from reaching their occupational goals. Coinciding with this interpretation, Trusty, Watts, and Erdman (1997) found that SES was a significant predictor of parental involvement in their teenager's career development. Based on the interpretations offered by previous authors, the current study hypothesized that SES has an indirect effect on educational expectations through the latent factor of perceived barriers.

Family Influence on Educational and Career Expectations

Another social psychological variable that has been studied extensively in the area of adolescent educational and career expectations is family influence, specifically family academic support and parental educational level. Previous literature on family academic support has found that when parents were supportive of their children's academic and career aspirations, the youth had clearer career goals (Hill et al., 2003), they spent more time and effort exploring various career options (Kracke, 2002), and they had higher academic and occupational expectations for themselves (Ali, McWhirter, & Chronister, 2005; Trusty, 2001). In a study of rural Appalachian youth, Ali and Saunders (2006) found that perceived parental support was a primary predictor of students' academic expectations. Additionally, in a sample of undergraduate students, Hargrove, Creagh, and Burgess (2002) found that college students possessed greater career planning self-efficacy if their family placed an emphasis on achievement in school and work.

Although most research investigating the relationship between parental support and academic expectations has found a significant positive effect between these two variables, some studies have failed to find a significant relationship between them. For example, Schoon (2001) conducted a longitudinal study in which she investigated

whether career aspirations at the age of 16 were predictive of career attainment at age 33. She found that career attainment was related to gender, parental education, teacher and self-ratings of aptitude, mathematical achievement test scores, and school environment. However, contrary to previous findings, parental interest did not significantly correlate with career attainment at age 33.

Rather than interpret Schoon's (2001) results as contradictory to other findings in this field of research, the current author believes that her results provide evidence of the situational importance of parental support. Taking a lifespan perspective, it may be that parental support is important during the formative pre-adolescent years, and that parental influence diminishes in later adolescent development. For example, according to Erikson's (1963) developmental theory, pre-teens must resolve the developmental crisis of Industry vs. Inferiority. During this stage, children and pre-teens are occupied with developing a sense of competency, productivity, and emerging independence. However, this goal is complicated by the fact that cognitive maturation is still incomplete for children and pre-teens. Therefore, individuals at this stage must balance a tension between a sense of mastery and seeking reassurance from family members. At this stage, then, parental support helps direct and shape the pre-teen's career goals.

However, once pre-teens reach adolescence, it appears that their actual career goals predict their career path, and parental influence wanes. Along with deciding on a political point of view, religious affiliation, and gender identity, choosing a career goal is an important part of resolving the identity crisis that occurs during adolescence (Erikson, 1963). In order to resolve their crisis of identity vs. role confusion (Erikson, 1963), many adolescents will "try out" different roles or identities, before deciding on their final adult

identity (Berger, 2005). This “role-playing” can be confusing or even frustrating for parents and family members. Berger (2005) suggests that adolescents value their peer relationships more highly at this stage of lifespan development because their friends provide them the freedom to experiment with different possible selves in a way that parents often do not. Thus, as adolescents navigate their journey towards adulthood, they ultimately make career choices, which are then better predictors of their career attainment compared to parental influence (Schoon, 2001). Such results illustrate the importance of considering developmental issues as they relate to one’s sample.

Family influence has also been found to impact adolescents’ academic and occupational expectations through parental education level. Several researchers have found evidence that parents who have, or are, pursuing a higher level of education or a more prestigious career act as role models for their children. To illustrate, Behnke et al. (2004) found that parents who wanted to pursue more education had children with higher occupational aspirations. The authors contend that this finding represents the fact that parents are important role models for their children. In a similar vein, other research has found that parental education level was a significant predictor of adolescents’ adult career attainment (Schoon, 2001), that parental occupation influences occupational decisions during adolescence and into young adulthood (Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002; Schmitt-Rodermund & Vondracek, 2002), and that parents who have pursued higher education hold greater expectations for their children than parents who have attained lower educational levels (Raty, Leinonen, & Snellman, 2002).

Unfortunately, the above studies did not disentangle the potential effect of parental role modeling from that of instilling or passing down educational values from parent to

child. However, support for the parental role modeling interpretation comes from a study by Rojewski and Yang (1997). In this study, the authors found that adolescents' educational expectations were more strongly associated with parents' educational levels than with parents' expectations for adolescents. These results indicate that teenagers may be "doing as their parents do" rather than "doing as their parents say." While most of the literature points to a positive correlation between family academic support, parental education level, and adolescents' educational and career expectations, in their review of the literature, Whiston and Keller (2004) point out that family dynamics can have a negative impact on adolescents' career expectations. Case in point, research has found that families that are enmeshed struggle to successfully carry out and complete career-related tasks (Whiston & Keller, 2004). For adolescents who are growing up with "helicopter parents," too much parental involvement may actually hinder their ability to make independent educational and career choices.

Families can also have a negative impact upon adolescents' ability to make educational and career decisions if their family frequently experiences conflict. In comparing different family dynamics, Hargrove, Creagh, and Burgess (2002) found that family conflict was negatively associated with career decision-making self-efficacy among family members. Family conflict seems to be internalized in a way that inhibits the family member's ability and confidence to make career decisions.

Due to the documented relationships between family academic support, parental education level, educational expectations, and career expectations, the current author hypothesized that family academic support and parental education level would be positively related to adolescents' educational expectations.

Social Learning Theory and Social Cognitive Career Theory

Further support for the interpretation that parental influence is expressed through their role modeling comes from Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994, 1996, 2000). Social Cognitive Career Theory is an adaptation of Social Cognitive Theory (SCT; Bandura, 1986), in which the principles of SCT are applied to the domains of academic and career choice. According to SCT (Bandura, 1986) human agency and decision-making capabilities arise from a complex interplay of cognitive processes, motivational processes, affective processes, and environmental selection processes. In turn, SCT posits that the proximal determinants of each of these processes is our sense of self-efficacy (Bandura, 1989), which can be described as our assessment of our capability to succeed at a specific task (Bandura, 1997).

In this instance, adolescence is a period in which teenagers are using the social cues around them to make decisions about their future, including their educational path and anticipated career. According to SCT, to the extent that a particular educational or career path has been modeled for them, the likelihood that they will choose such a path should increase, due to the positive effect modeling has on self-efficacy. Self-efficacy in turn affects young persons' thought process about what they are capable of achieving, their motivation to pursue a goal, their feelings about potential success and failure, and the environment in which they choose to place themselves. The last step in this chain of events is that the complex interaction of all these factors leads, ultimately, to a career related choice.

In his work on self-efficacy, Bandura (1997) emphasized that the effect of modeling should be greater if the person who engaged in the modeling behavior is a significant

figure in the teenager's life (such as a parent or guardian), and if the teenager perceives a degree of similarity between herself or himself and the role model (such as same age and same gender friends). Theoretically, then, seeing someone similar to oneself achieve the career of his or her choice should increase the adolescent's feeling of capability to also attain his or her chosen career.

As rolemodels, parents can influence their children's educational and occupational expectations in a number of ways. For example, in a survey, children cited their parents as their primary source for occupational suggestions (Trice, McClellan, & Hughes, 1992). However, parental influence waned by the 6th grade, suggesting that parents' influence was being replaced by other significant figures in the children's lives, such as peers (Trice, Hughes, Odom, Woods, & McClellan, 1995; Trice & Knapp, 1992). Over the lifespan, however, parental influence tends to carry more weight than peer influence. For example, in a longitudinal study, it was found that parental expectations of success directly influenced students' expectations of success, and students' expectations of success are, in turn, a predictor of adult professional attainment (Poole, Langan-Fox, Ciavarella, & Omodei, 1991).

In an interesting piece of research, Schmitt-Rodermund and Vondracek (2002) found that individuals who came from a family background of entrepreneurship and who were less willing to expend effort in their work life tended to choose not to go into business for themselves. The authors argue that in this case, the parents' modeling had a negative effect, in that the parents' modeling of this difficult career path deterred their children from following in their footsteps.

SCCT posits that expectations for achievement in the arenas of educational and career behavior are the result of a complex interplay between feelings of self-efficacy and anticipated future outcomes, which are in turn affected by variables such as social norms, media messages, and presence (or absence) of rolemodels. To better understand the role that social modeling plays in shaping adolescent career expectations, Ali, McWhirter, and Chronister (2005) measured teenagers' vocational and educational self-efficacy, feelings of parental support, feelings of sibling support, feelings of friends' support, and their career expectations. As predicted by SCCT, the authors found that self-efficacy was a significant predictor of adolescents' career expectations. In addition, sibling and peer support explained additional variance in career expectations over and beyond that of the predictor of self-efficacy. Interestingly, contrary to predictions of both SCT and SCCT, the authors found that parental support was not a significant predictor of career expectations. Theoretically, these findings are better understood in the context of peer cluster theory, the second theoretical framework utilized in this research project.

The current analysis draws upon SCCT as a source of theoretical support for many of the hypothesized relationships in the structural equation model being tested. Based upon SCCT, the effects of the variables of gender, ethnicity, and socio-economic status on educational and career expectations were hypothesized to be moderated by the variable of perceived barriers.

Peer Cluster Theory

In addition to the power of adult role models, previous research has shown that peer influences also affect an adolescent's educational and career path. Gustafson, Stattin, and Magnusson (1992) found that among Swedish 15-year-old girls with low educational

motivation, those who had boyfriends, working friends, and older friends were significantly more likely to have had a child by the age of 26 and significantly less likely to have pursued education beyond a compulsory level. The authors argue that an older, working peer group directs teenagers away from further educational pursuits, and encourages them to take on low-status occupations (including “homemaking”) directly out of high school. According to the authors, having a boyfriend at 15 appeared to steer the young women towards a “homemaker orientation” (Gustafson et al., 1992).

Such findings can be understood from the perspective of peer cluster theory (Oetting & Beauvais, 1987). Peer cluster theory argues that the path from adolescents’ attitudes to their behavior is primarily influenced through their peer relationships. While the family and school system are seen as important agents in an individual’s childhood, at adolescence the focus shifts to peer friendships, as the teenager attempts to break away from the constraints of family and school authority to form the individual identity. Peer cluster theory states that adolescents’ attitudes, values, beliefs, and behaviors are shaped by the peers with whom they choose to associate.

In this theory, the greatest amount of influence comes from peer clusters, which are defined as groups of individuals who are close and share a set of values and norms based on group consensus. In contrast to the concept of peer pressure, in peer cluster theory each member of the group contributes to the behavior and norms of the group, thus creating a shared group identity and ideology. Oetting and Beauvais (1987) specify that peer clusters can be as small as a best friend dyad, or as large as a gang of friends who hang out together on a regular basis.

Previous research utilizing peer cluster theory has focused on its utility in predicting adolescent drug use (e.g., Oetting & Beauvais, 1986, 1987). However, the current author feels that the socialization process of peer clusters may help to explain adolescents' educational expectations as well. According to peer cluster theory, peer clusters should share group norms regarding factors such as school performance. For example, some peer clusters might share a norm that school performance is unimportant, whereas others might share a norm that school performance is very important.

Keeping in mind that peer clusters can also be thought of as friends who are spending time together, one can hypothesize that as group members internalize these shared norms, their own school adjustment and school performance should be correlated with the school adjustment and school performance of their friends. A study conducted by Kracke (2002) supports this notion, finding that peer interactions focusing on career issues correlated with more information seeking behavior and helped explain changes in career exploration. Similarly, Young, Antal, Bassett, Post, DeVries, and Valach (1999) analyzed conversations between adolescent peers regarding career planning and aspirations. The authors found that in pairs where values were similar, the conversation was more natural and flowed more easily. Peers also encouraged each other to follow their aspirations, rather than cave in to parental pressure in career selection.

Furthermore, whereas Ali et al. (2005) did not find parental support to be a significant predictor of career expectations, they did find that sibling support and peer support accounted for 36% of the variance in vocational and educational self-efficacy, which in turn was a significant predictor of career expectations. These and other findings summarized above are in agreement with the premise of peer cluster theory in that peers

were found to be significant influences on one another, specifically in the domain of career planning, aspirations, and exploration.

Thus, from the perspective of peer cluster theory, it becomes important to examine the influence of friends and peers if we are to understand adolescents' academic expectations. In particular, the current author is interested in the relationship of friends' school adjustment and friends' school performance to the students' own school adjustment and school performance.

Intermediary Variables: Perceived Barriers, School Adjustment and School Performance

The current study hypothesizes that the relationship of demographic, family socialization, and peer socialization variables examined in the previous literature on educational and career expectations have an indirect effect on educational expectations through the variables of perceived barriers, school adjustment, and school performance. Previous literature on career barriers has defined the term "career barriers" as events or conditions that impede career progress for an individual (Ali et al., 2005). These conditions can be internal to the individual, such as self-esteem, or environmental, such as working in a sexist environment. The current study examined the relationship between perceived barriers and adolescents' demographic characteristics of gender, ethnicity, and family socio-economic status. Note that the current study uses the term "perceived barriers," rather than the term "career barriers." In the current study, a perceived barrier is defined as an obstacle which the individual believes will impede the realization of her or his educational expectations. The current author has chosen to use the term "perceived barriers" because the perception of an obstacle or barrier can have a distinct negative

psychological impact separate from the question of whether or not the barrier is a true impediment to the individual's expectations.

Previous research has found that it is not necessarily demographic variables in and of themselves that affect the students' educational and career aspirations, but rather it is the social construction of these variables and the racism, sexism, and classism that accompanies their social construction that affects students' educational and career aspirations (Gottfredson, 1986; Hotchkiss & Borow, 1990). For example, Behnke et al. (2004) found that racism is a perceived barrier to career goals for minority youth. Other research has documented that perceived barriers can include cost of education and early parenthood (Mortimer et al., 2002).

Another variable theorized to mediate effects on adolescents' career and educational expectations is school adjustment. Previous research has documented the relationship between school adjustment and career and educational expectations. Specifically, previous research has found that delinquent adolescents have lower occupational expectations than their non-delinquent peers (Rojewski & Hill, 1998) and that teachers' feelings toward students, which is a part of school adjustment in the current analysis, influence student performance (Parsons, Kaczala, & Meece, 1982).

As discussed earlier, peer cluster theory (Oetting & Beauvais, 1987) suggests that peers influence individual attitudes and behavior, especially in social settings such as the school. According to peer cluster theory, students who socialize with delinquent peers are more likely to become delinquents themselves. Thus, from the framework of peer cluster theory it was hypothesized that peer school adjustment would be related to individual school adjustment. Based on the previous literature cited above, it was also

hypothesized that (1) individual school adjustment would be directly related to educational expectations, and (2) school adjustment would be indirectly related to educational expectations through school performance.

The final intermediary variable in the current model is school performance. School performance was hypothesized to be directly related to educational expectations, while operating as an intermediary variable for the effects of family academic support, parental education level, and friends' school performance, and school adjustment. Previous research has documented a direct relationship between school performance and educational expectations. For example, Reyes et al. (1999) found that those aspiring to male-dominated careers, which are often more prestigious and higher paying in U.S. culture, had higher GPAs. Similar findings were reported by Rojewski and Kim (2003), who found that youth aspiring to attend college had higher scores on reading, mathematics, and science achievement tests than their work-bound peers.

While several studies have examined the relationships between parental support, parental education level, and adolescents' career expectations, few studies have provided a theoretical explanation for such relationships. Several authors have argued that parents act as role models, and it is through modeling that parental level variables influence the adolescents' beliefs about what they will accomplish (Ali & Saunders, 2006; Behnke et al., 2004; Mortimer et al., 2002; Schmitt-Rodermund & Vondracek, 2002). However, it may be that the effect of parental level variables on career and educational expectations is mediated by a third variable that has not been taken into account in the previous literature. The current author believes that one important mediator in this context is school performance. It has been documented elsewhere that students with more educated

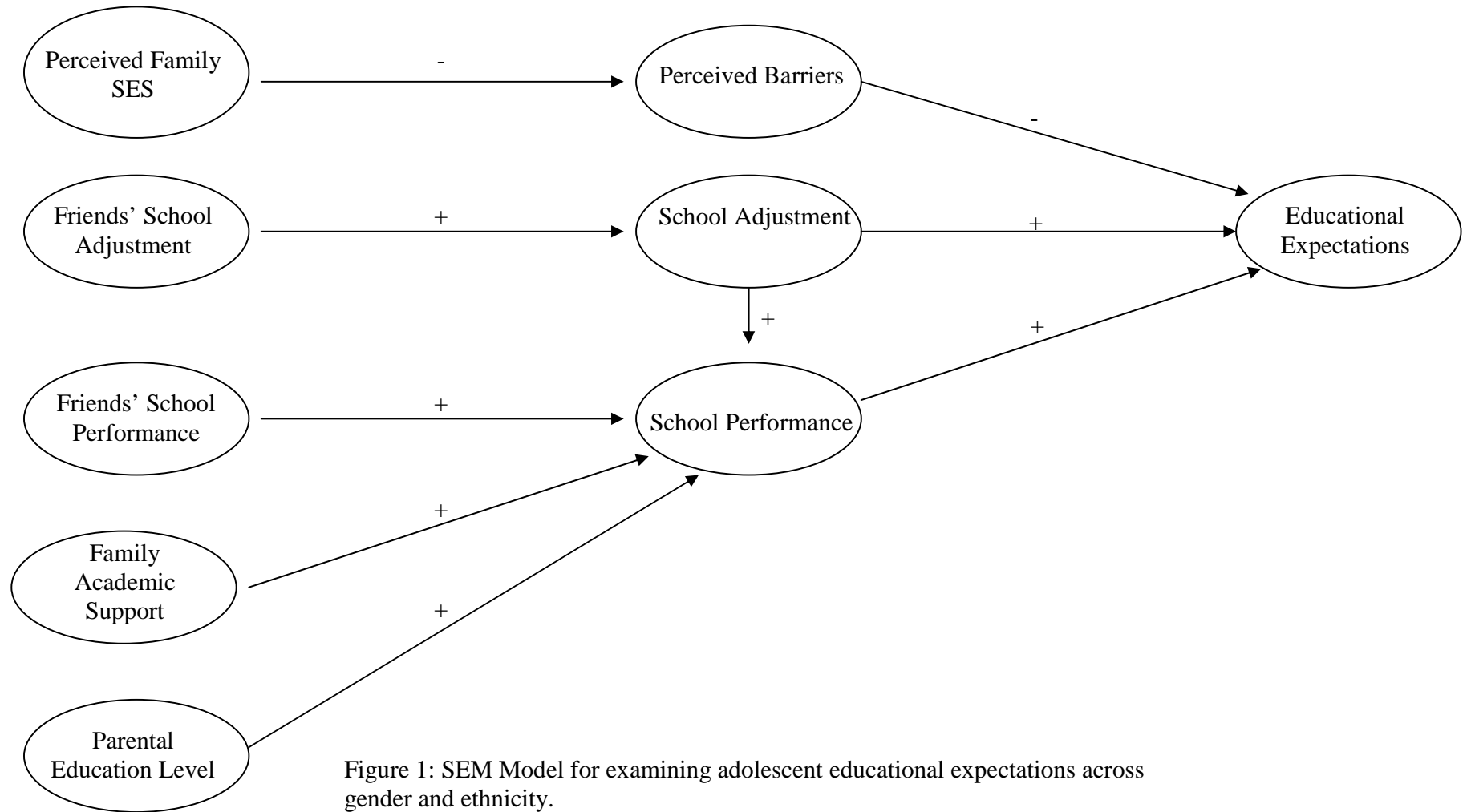
parents do better in school than their peers with less educated parents (Rojewski & Kim, 2003). Furthermore, those who feel supported in academic pursuits do better in school than their peers who do not feel supported (Ali et al., 2005). Based on these findings, it was hypothesized that school performance would act as an intermediary variable between parental education and family support and adolescents' career and educational expectations.

Model Summary

The current study sought to understand the relationship between adolescents' educational expectations and a variety of individual, peer, family, and academic characteristics. Based on the findings of previous literature and theoretical speculation, the current author constructed a structural equation model relating adolescents' educational and career expectations to individual, peer, family, and academic characteristics (see Figure 1). Furthermore, due to the conflicting findings regarding the effect of gender and ethnicity on career and educational expectations, this model was tested for structural invariance across the demographic variables of gender and ethnicity. In summary, the current author hypothesized:

1. Family socio-economic status would have an indirect relationship to educational expectations through the variable of perceived barriers.
2. The family socialization variables of family academic support and parental education level would have an indirect relationship to educational expectations through school performance.

3. The peer socialization variables of friends' school adjustment and friends' school performance would have an indirect relationship to educational expectations through the factors of school adjustment and school performance, respectively.
4. School adjustment would have a direct relationship to educational expectations, and an indirect relationship through school performance.
5. The relationship of perceived barriers, school adjustment, and school performance with career expectations would be direct.
6. The fit of the hypothesized structural model may vary by gender and ethnicity of the participants.



Chapter II: Method

Participants

The current analysis used a pre-existing data set to examine the hypotheses in question. After examining the pre-existing data set, a subset of the total cases was selected for inclusion in the current study. Specifically, the current study limited itself to examining all 7th and 8th grade cases. The original data set was collected by the Tri-Ethnic Center for Prevention Research under the project “Adolescent Drug Use in Rural America¹.” Information on the participants and data collection methods of this project have been published elsewhere (see Edwards, Stanley, Plested, Marquart, Chen, & Jumper-Thurman, 2007). However, certain key aspects of the sample and sampling procedure are reiterated here.

The original sub-set of data utilized in the current study consisted of 87,474 junior high students (7th – 8th graders) attending school between 1996 and 2000. Of those students, 49.7% were male, 49.8% were female and .5% did not provide information on their gender. In terms of ethnic identification, 62.9% of the sample identified as European-American, 16.9% as Hispanic-American, 12.8% as African-American, and 3.8% identified as another ethnic group (such as Native American or Asian-American). Participants were relatively evenly distributed among 7th and 8th grade, with

¹ This project was funded by the National Institute on Drug Abuse (NIDA; R01 DA98349) and supervised by the primary investigator, Ruth W. Edwards

50.1% of the students enrolled in the 7th grade and 49.9% in the 8th grade. For a distribution of the students' ages, see Table 1.

Of the original 87,474 respondents, 11,256 participants were eliminated from the working sample due to the fact that they had not answered either of the outcome questions on educational expectations. The remaining 76,218 cases were then randomized in order and the first half ($n_1 = 38,109$) were used as a calibration sample in the SEM analysis, while the second half of the cases ($n_2 = 38,109$) were reserved as a validation sample to test for model fit across samples. For a comparison of the two samples by age, ethnicity, gender, and grade, see Table 2.

Table 1.
Age of Participants at Time of Survey (N = 76,218)

Age	<i>n</i>	Sample Percentage
10	8	.0
11	106	.1
12	16,676	22.0
13	35,184	46.2
14	20,908	27.4
15	2,798	3.7
16	316	.4
17	29	.0
18	6	.0
19	4	.0
20	5	.0
Missing data	178	.2
Total	76,218	100.0

Community Sampling Procedure

Data collection began by selecting a geographically stratified sample of communities from within the United States, specifically targeting ethnic minority rural communities, white rural communities, and comparison samples of non-rural communities. Ethnic minority communities were defined as communities that included 40% or more Mexican-

Americans or 40% or more African-Americans. Because Mexican-American communities are primarily located in the Southwestern United States, and African-

Table 2.
Comparisons of Calibration and Validation Samples on Demographic Characteristics

Variable	Calibration Sample (% of cases)	Validation Sample (% of cases)
Age		
10	.0	.0
11	.1	.1
12	21.8	21.9
13	46.3	46.1
14	27.5	27.4
15	3.6	3.8
16	.4	.4
17 – 20	.1	.1
Missing	.2	.2
Total	100.0	100.0
Ethnicity		
African-American	12.3	12.1
European-American	66.8	66.8
Hispanic-American	15.5	16.0
Other	4.1	3.8
Missing	1.3	1.3
Total	100.0	100.0
Gender		
Female	51.5	51.2
Male	48.1	48.3
Missing	.4	.5
Total	100.0	100.0
Grade		
7	49.0	48.9
8	51.0	51.1
Total	100.0	100.0

American communities are primarily located in the Southeastern U.S., the European-American comparison communities were chosen from the same regions of the country, so as to avoid confounding effects of ethnicity and geographic region. The final sample of

communities consisted of 42 African-American communities, 37 Mexican-American communities, 22 Southeastern European-American communities, and 33 Western European-American communities. After specific communities were selected for inclusion in the sample, the most representative high school in the community, and its feeder junior high schools, were invited to participate in the project. The “most representative high school in the community” was determined by comparing the ethnic composition of the community at large to the ethnic composition of the high schools in the community (when a community had more than one high school). The high school with the ethnic composition that most closely matched that of the community at large was chosen for inclusion in the original sample recruitment as the most representative high school in its respective community.

Schools that chose to participate were mailed the Community Drug and Alcohol Survey² (CDAS) to administer to all registered students in their school. After administration, the surveys were mailed back to the Tri-Ethnic Center and the survey responses were examined for evidence of inconsistent responding or exaggeration. Approximately 3% of survey data was discarded after examination due to inconsistency or exaggeration.

² The Community Drug and Alcohol Survey (CDAS) is based on The American Drug and Alcohol Survey and the Prevention Planning Survey, published by RMBSI, Inc. (www.rmbsi.com) and used under a memorandum of understanding between Colorado State University and RMBSI.

Materials

Students selected for participation in the sample were asked to complete the CDAS, a 99-item survey that asks students about a variety of topics, including substance use and substance use frequency, relationships with peers, school adjustment, experiences with crime and violence, relationships with family members, and ethnic group identification. Despite the number of items on the CDAS, on average students only took 20 minutes to complete the survey.

The current analysis utilized a subset of questions included on the CDAS. As demographic characteristics, gender and ethnicity were single-item responses. The remaining latent constructs consisted of between two and eight items, and the observed variables that were combined to constitute each latent construct are described below. Note that the theoretical basis of structural equation modeling (SEM) is that each observed variable can be predicted by its associated latent construct. For example, whether or not a student considers his or her family to be rich or poor is predicted by the underlying construct of the student's family's SES. Due to this theoretical assumption, the relationship of the observed variables to the latent construct can be thought of in terms of regression. In this example, the dependent variable (i.e., observed variable) of "Is your family rich or poor" is regressed onto the independent variable (i.e., latent construct) of SES. In the computer software package EQS, this relationship is represented through a series of equations in which the observed variables are expressed as a sum of their regression coefficient onto the latent construct and the associated error term in the prediction.

For a concrete example, consider: If V1 (variable 1) represents the question *Is your family . . . very rich, rich, average, poor, or very poor*, and that question is hypothesized to be associated with the latent construct SES, represented as F1 (factor 1), then this is represented in EQS as $V1 = F1 + E1$, where E represents the error in predicting V1 from F1. Therefore, when examining the factor loadings of observed (i.e., measured) variables, those factor loadings can be thought of as regression coefficients that have been weighted according to their degree of contribution to the latent factor (R. Swaim, personal communication, July 30, 2009). Note that in using structural equation modeling, the researcher must consider the theoretical validity of how the observed variables fit together as components of the latent factors. For example, it would be theoretically unsound to combine age, race, and gender into a latent factor labeled “background characteristics”(Byrne, 1994). To guard against such errors, the standard practice is to conduct factor analyses on the items that are hypothesized to share a latent factor. This ensures that there is sufficient reliability underlying the relationship between the observed factors that share a common latent predictor to move forward with the SEM analysis. As a preliminary step, the items that are used to measure each latent construct in this study were subjected to Cronbach’s reliability analysis to determine whether the items on each scale had sufficient reliability to be included in the remainder of the analysis. This was then followed by conducting confirmatory factor analyses on the proposed latent factors.

In the current model, Family Socio-Economic Status (Family SES) is a latent construct, and three survey questions (or three observed variables) were regressed onto it. The Family SES variables consisted of responses to the following questions: Is your

family . . . *very poor, poor, average, rich, or very rich*(scored as 1, 2, 3, 4, and 5, respectively); My family has enough money to buy the things we want:*Almost never, Some of the time, Yes, most of the time, Yes, all of the time*(scored as 1, 2, 3, and 4, respectively); My family has enough money to buy what we need: *Almost never, Some of the time, Yes, most of the time, Yes, all of the time*(scored as 1, 2, 3, and 4, respectively). In the Cronbach's reliability analysis, the Family SES scale achieved an alpha reliability score of .659.

Two family socialization constructs, family academic support and parental education level, were included in the current analysis. Family academic support was a latent construct, in which four observed variables were used as indicators of the latent factor. For this latent construct, students were asked to answer the following four questions: How much would your family care if you skipped school? How much would your family care if you got a bad grade? How much would your family care if you did not do your homework? How much would your family care if you quit school? For each of these four questions, students could respond according to a four-point Likert scale with the following choices: *not at all, not much, some, a lot* (scored as 1, 2, 3, and 4, respectively). Using Cronbach's alpha (α) as a measure of internal consistency reliability, the family academic support items scored an $\alpha = .833$ in the reliability analysis. Parental education level was a latent construct in which two observed variables were used as indicators. For these two survey questions, students reported the highest grade of school completed by their (1) father and (2) mother. Due to the fact that only two variables comprised the parental education level construct, Pearson's r was used as a measure of covariance for the scale, rather than Cronbach's alpha, which is only appropriate for scales that have 3

or more items. The two observed indicators for the parental education scale correlated at $r = .697, p < .001$.

Two peer latent factors were also included in the current analysis: friends' school adjustment and friends' school performance. Friends' school adjustment was a latent construct that was measured with three survey questions. These three survey questions asked the students the following: Do your friends like school? Do your friends like their teachers? Do your friends think school is fun? As with the latent factor of family academic support, students could respond according to a four point Likert scale with the following choices: *not at all, not much, some, a lot* (scored as 1, 2, 3, and 4, respectively). Friends' school performance was a latent factor in which two observed variables were used as indicators. These two variables consisted of the following two questions: What kind of grades do your friends get? What kind of students are your friends? The students could answer according to a four point Likert scale with the following choices: *poor, not too good, good, or very good* (scored as 1, 2, 3, and 4, respectively). The friends' school adjustment scale achieved $\alpha = .892$ in the reliability analysis, and the friends' school performance scale, which was a two-item scale, reached a correlation of $r = .692, p < .001$.

Another latent factor of interest in the current study was perceived barriers. This latent factor was measured through eight survey questions (i.e., eight observed variables). The eight survey questions used to construct the latent factor of perceived barriers were formatted slightly differently from the other items on the survey. Students first read the following stem question: Will any of the following things keep you from having the job you would like when you are an adult? Then students were presented with eight phrases that represented potential barriers to the goal of getting the job they would

like as an adult. These phrases were: (1) Not having the money for training or school, (2) Don't want to move far from my family, (3) Family needs me to work at home, (4) No opportunities in this community, (5) Having a child, (6) My drug or alcohol use, (7) Marriage, (8) I won't try hard enough. For each of the eight phrases, students rated whether the statement represented a barrier on a 4-point Likert scale with the following options: *won't at all*, *might*, *probably*, or *sure it will* (scored as 1, 2, 3, and 4, respectively). A reliability analysis of the perceived barrier items found $\alpha = .817$ for the 8-item scale.

In addition to the above-mentioned latent factors and their associated observed variables, the latent factors of students' school adjustment and school performance were also examined. The manifest variables that were used for these latent factors mirrored the questions that were used for the latent factors of peer school adjustment and peer school performance. For the school adjustment factor, four survey items were used. These items asked the students to rate to what degree they agreed with the following statements: I like school, My teachers like me, I like my teachers, and School is fun. Students rated each item according to a four point Likert scale with the following options: *not at all*, *not much*, *some*, or *a lot* (scored as 1, 2, 3, and 4, respectively). The school performance factor was measured by two observed variables. Students were asked to answer the following two survey questions: What kind of grades do you get? What kind of student are you? The students answered each question according to a four point Likert scale with the following options: *poor*, *not too good*, *good*, or *very good* (each scored as 1, 2, 3, and 4, respectively). The school adjustment scale had $\alpha = .873$ in the reliability analysis,

while the school performance scale, which was a two-item scale, reached a correlation of $r = .682, p < .001$.

The outcome of interest in the current analysis was educational expectations. In the current study the latent factor of educational expectations was measured through two observed variables. Students were asked the following two questions: Will you graduate from high school? Will you go on to college or other school after high school? Students could answer according to a five-point Likert scale with the following options: *No chance that I will, Poor chance, Fair chance, Good chance that I will, Yes, I'm sure I will* (each scored as 1, 2, 3, 4, and 5, respectively). The educational expectations scale, which was a two-item scale, achieved a correlation of $r = .587, p < .001$.

Procedure

Because the participants in the survey were minors, parents or guardians of all students received a letter informing them of the purpose, content, and date of the surveying. If parents preferred that their child(ren) did not participate, they were asked to sign a notice and return it to the school prior to the date of the surveying, or to call the school and indicate that they did not want their child(ren) to participate. To ensure that parents were fully informed of the nature of the questionnaire, a copy of the survey was available at each school for the parents to examine, and parents were given a toll free number that they could call to speak with the Principal Investigator of the study.

In addition, at the time the survey was administered, students were told that their participation was voluntary, that they could choose to end their participation at any time, and that they could leave any question blank. The students were reminded not to put their name or any identifying information on the survey, and that all data would remain

anonymous and confidential. Schoolteachers, or other school personnel, administered the survey during normal school hours.

Chapter III: Results

Comparison of Missing Data Cases to Retained Data Cases

Before proceeding with the structural equation modeling analysis, an extensive comparison of the cases that were rejected due to missing data on the outcome variables ($n = 11,256$) to the cases that were retained ($n = 76,218$) was conducted. For each observed variable included in the SEM analysis, ANOVA analyses were conducted to compare the mean scores of students who did not respond to the questions on Educational Expectations with the scores of those students who did respond to the questions on Educational Expectations.

Missing data cases were divided into two categories. The first category was respondents who left the questions blank. The second category was respondents who provided multiple responses to the same question, invalidating their data. Regarding the first category of missing data, students who did not answer the question, Will you graduate from high school? ($n = 581$), had a significantly lower mean score on the question, What kind of grades do you get?, compared to students who had answered the question, $F(5, 87,468) = 4,704.349, p < .001, \eta^2 = .212$. This significant difference indicates that students who did not answer the question, Will you graduate from high school?, received poorer grades than students who were sure they would graduate from high school, and students who thought they had a good chance, fair chance, poor chance, or no chance to graduate high school.

In addition, students who did not answer the question, Will you graduate from high school? ($n = 560$; note that sample sizes for the missing data group vary from one analysis to another due to the fact that pairwise deletion was used in the SPSS analyses), had a significantly lower mean score on the question, What kind of student are you?, compared to students who had answered the question, $F(5, 87,474) = 4,354.500, p < .001, \eta^2 = .205$. This result indicates that students who did not answer the question, Will you graduate from high school?, rated themselves as poorer students than those who were sure they would graduate from high school, and those who said they had a good chance, fair chance, no chance, or poor chance of graduating from high school.

Regarding the eight phrases measuring the latent construct of perceived barriers, students who provided multiple answers to the question, Will you graduate from high school?, were more likely to believe that a number of obstacles could prohibit them from getting the job they wanted as an adult compared to students who provided a single valid response. These obstacles included: not having the money for training or school, $F(5, 87,468) = 4,354.500, p < .001, \eta^2 = .199$, not wanting to move away from their family, $F(5, 87,468) = 4,042.661, p < .001, \eta^2 = .188$, their family needed them to work at home, $F(5, 87,468) = 4,018.269, p < .001, \eta^2 = .187$, having a child, $F(5, 87,468) = 3,630.229, p < .001, \eta^2 = .172$, and marriage, $F(5, 87,468) = 3484.938, p < .001, \eta^2 = .166$.

In terms of demographic characteristics, non-responders and students who gave more than one response to the outcome question, Will you graduate from high school?, were more likely to be male (14.8% of the male data was classified as missing compared to 9.8% of the female data; when tested with chi-square the results indicated $\chi^2(6) = 794.911, p < .001$), and to identify as an ethnic minority (16% of the African-American

data was classified as missing, 18% of the Hispanic-American data was classified as missing, and 7% of the European-American data was classified as missing; when tested with chi-square the results indicated $\chi^2(18) = 3,172.44, p < .001$).

Examining the second outcome question of interest, it was found that students who answered the question, Will you go on to college or other school after high school?, with multiple responses were more likely to perceive that not having the money for training or school, $F(5, 87,468) = 3,663.397, p < .001, \eta^2 = .173$, not wanting to move away from their family, $F(5, 87,468) = 3,351.487, p < .001, \eta^2 = .161$, their family needed them to work at home, $F(5, 87,468) = 3,330.699, p < .001, \eta^2 = .160$, and having a child, $F(5, 87,468) = 3,047.193, p < .001, \eta^2 = .148$, would be obstacles to getting the job they desired as adults.

Although the number of cases excluded due to missing data issues on any one of these survey questions was small (sample subset ranged in size from $n = 62$ to $n = 581$) relative to the overall sample size ($n_1 = 38,109; n_2 = 38,109$), these differences in missing data cases and retained cases should be kept in mind when examining the final results.

In addition, in considering these comparisons between the missing data cases and the retained cases, the large sample size of the data set should also be taken into account. Due to the fact that the *power* of a statistical test increases as sample size increases, given a fixed *p*-value criterion for the test, statistical tests utilizing larger sample sizes are more likely to reject the null hypothesis. Therefore, using larger sample sizes reduces the likelihood of making a Type II error. Furthermore, very large samples allow researchers to detect very small differences between groups, differences that may be negligently different from the null hypothesis. This introduces the issue that Agresti and Finlay

(1997) term *statistical versus practical significance*. While a large sample size aids researchers in detecting even very small differences between groups, those differences may be so small as to be practically unimportant. For example, when looking at the differences between students who did and did not answer the question, Will you graduate from high school?, it was found that non-responders had significantly lower self-reported grades than students who provided a valid response, such as, I have a *very good* chance to graduate high school. However, the magnitude of this difference was 0.47 on a four-point scale, less than one-half of a point difference between the two groups--a difference which, it could be argued, is *practically insignificant* even if it is *statistically significant*.

Furthermore, although the effect sizes in the above analysis ranged between .148 and .212, these effect sizes represent comparisons between 6 different groups of students: (1) students who did not answer the question, (2) students who were sure they would graduate high school / go on to college, (3) students who thought they would probably graduate high school / go on to college, (4) students who thought they might graduate high school / go on to college, (5) students who thought they would not at all graduate high school / go on to college, and (6) students who answered the question more than once. The analyses presented above summarize results that found a significant difference between the missing data groups (groups 1 and 6) and the non-missing data groups. However, in those same analyses, significant differences were also found between students who were more confident that they would graduate high school / go on to college, and those who were less confident that they would graduate high school / go on to college. Therefore, it is important to keep in mind that the reported effect sizes represent more than the magnitude of the differences between missing data groups and

non-missing data groups on the dependent variables. Rather, the effect sizes represent the amount of variance in the dependent variable that is explained by the students' responses on the independent variable.

Descriptive Statistics and Measurement Model Results

Table 3 presents the means, standard deviations, factor loadings, and residuals, utilizing the calibration sample data, for each of the observed variables. For each variable, the factor loadings and residuals for the initial measurement model are presented first, and the factor loadings and residuals for the revised measurement model are presented in parentheses. Note that the sample size for all tests of the measurement model was $n = 38,109$. Before assessing the fit of the measurement model using EQS, missing data were handled using the EM imputation method. For both the initial measurement model, and the revised measurement model, all factor loadings were significant at the $p < .05$ level.

Because preliminary results indicated that the data did not approximate a normal distribution for some variables, the robust method of estimation was used for testing the fit between the hypothesized model and the calibration sample data. The initial measurement model produced a poor fit for the calibration sample data, (Robust comparative fit index [CFI] = .863).

After reviewing the results from the initial measurement model, a revised model was tested in which the eight manifest variables comprising the Perceived Barriers latent factor were divided into four different latent factors, with two observed variables loading onto each of the four new latent factors. The changes to the initial model were based on

both statistical and theoretical considerations. The revised model, then, contained four latent factors that replaced the initial perceived barriers latent factor. The

Table 3.
Means, Standard Deviations, Factor Loadings, and Residuals for the Observed Variables (Calibration Sample, n = 38,109)

Variable	M	SD	Factor Loading	Residual
SES: Family Rich or Poor	2.86	.49	.51 (.51)	.86 (.86)
SES: Enough Money for Wants	2.22	.72	.76 (.76)	.69 (.64)
SES: Enough Money for Needs	1.42	.64	.65 (.64)	.76 (.79)
Friends Adj.: Like School	2.30	.81	.89 (.89)	.45 (.45)
Friends Adj.: Like Teachers	2.32	.79	.84 (.84)	.55 (.55)
Friends Adj.: School is Fun	2.54	.89	.87 (.87)	.49 (.49)
Friends Perf.: Kind of Grades	2.01	.55	.79 (.79)	.61 (.61)
Friends Perf.: Kind of Students	1.96	.57	.89 (.89)	.45 (.45)
Family Support: Skip School	1.30	.72	.83 (.83)	.55 (.55)
Family Support: Bad Grade	1.62	.81	.72 (.72)	.70 (.70)
Family Support: Homework	1.75	.90	.69 (.69)	.72 (.72)
Family Support: Quit School	1.17	.64	.75 (.75)	.66 (.66)
Parent Education: Dad's Grade	8.40	5.98	.89 (.89)	.45 (.46)
Parent Education: Mom's Grade	9.25	5.74	.80 (.80)	.60 (.60)
Barrier _(Resource) : No Money	3.14	.96	.61 (.68)	.79 (.74)
Barrier _(Family) : Don't Want Move	3.13	.95	.51 (.58)	.86 (.82)
Barrier _(Family) : Family Needs Me	3.48	.86	.60 (.68)	.80 (.74)
Barrier _(Resource) : No Opportunities	3.26	.95	.59 (.62)	.81 (.79)
Barrier _(Relationship) : Having a Child	3.13	1.02	.70 (.90)	.71 (.44)
Barrier _(Personal) : Substance Use	3.45	1.02	.53 (.67)	.85 (.74)
Barrier _(Relationship) : Marriage	3.24	.96	.64 (.77)	.77 (.63)
Barrier _(Personal) : Won't Try	3.29	1.09	.60 (.79)	.80 (.62)
Self Adj.: Like School	2.13	.89	.84 (.84)	.55 (.55)
Self Adj.: Teachers Like Me	1.85	.80	.72 (.72)	.70 (.70)
Self Adj.: I Like Teachers	2.00	.83	.78 (.78)	.63 (.63)
Self Adj.: School is Fun	2.38	.97	.84 (.84)	.54 (.54)
Self Perf.: Kind of Grades	1.83	.67	.79 (.79)	.61 (.61)
Self Perf.: Kind of Student	1.76	.64	.87 (.87)	.49 (.49)
Expectations: Graduate School	1.24	.64	.75 (.75)	.66 (.66)
Expectations: Go to College	1.57	.97	.78 (.78)	.62 (.62)

new factors were named: Resource Barriers, Family-of-Origin Barriers, Relationship Barriers, and Personal Choice Barriers.

For each of the barrier questions, the question stem was: Will any of the following things keep you from having the job you would like when you are an adult? Students were then presented with eight phrases that represented different kinds of potential barriers that could prevent them from getting the job they would want as an adult. These eight phrases were divided into four different categories to create the four barrier latent factors. Resource Barriers was measured via the phrases: *Not having the money or training for school* and *No opportunities in this community*. Family-of-Origin Barriers were measured via the phrases: *Don't want to move far from my family* and *Family needs me to work at home (business, farm, etc.)*. Relationship Barriers were measured via the phrases: *Marriage* and *Having a Child*. Personal Choice Barriers were measured via the phrases: *My drug or alcohol use* and *I won't try hard enough*.

The revised measurement model resulted in improved model fit, (Robust CFI = .902). Table 4 presents the fit statistics for the initial and revised measurement models (including the models' chi-square values, the normed fit index (NFI), the comparative fit index (CFI), and the Root Mean Square Residual (RMSR)). For the initial and revised measurement models, which are nested within one another, the chi-square difference value is also presented as a measure of improved fit from the initial model to the revised model. Keeping in mind that the difference in chi-square values is assumed to be distributed as a chi-square value in and of itself, if the chi-square difference achieves significance, then that is taken as additional evidence that the revised model is a better fit to the data than the initial model. Table 5 presents the inter-factor correlations for the revised measurement model.

Table 4.

Fit Statistics for the Independence, Initial, and Revised Measurement Models

Model	χ^2	df	NFI	CFI	RMSR	$\chi^2\Delta$	p
Independence	530,707.22	435	---	---	---	---	---
Initial	52,114.91	369	.862	.863	.046	---	<.001
Revised	37,416.09	339	.901	.902	.039	14,698.83	<.001

Structural Equation Modeling Results for the Calibration and Validation Samples

After attaining an acceptable level of fit with the measurement model, the calibration sample was then used to assess the fit of the full structural model, which is based on Hypotheses 1 – 5 (see pages 21 – 22). Figure 2 presents the standardized solution for the hypothesized structural model. Using the robust estimation method to assess fit yielded a Satorra-Bentler scaled Chi-square value of 67,790.06, with degrees of freedom equal to 390, $p < .001$. Although a significant Chi-square result in EQS is generally interpreted as a misfit between the specified structural model and the co-variance structure of the data, in cases where the sample size is very large, such as the current case, Chi-square tends to be significant even when the hypothesized model could be correct (Byrne, 1994). Therefore, in order to assess a more accurate estimate of model fit, the robust comparative fit index was examined, as the CFI takes into account the inflation effects of large sample sizes and the robust estimation method accounts for non-normal distributions of variables. The robust CFI for the initial structural model was .821, which indicates a relatively poor fit for the sample data.

Based on the examination of the Chi-square results, robust CFI, and the Normed Fit Index (NFI), all of which indicated a level of misfit between the hypothesized model and the data set, the LaGrange Multiplier Test (LM Test) was utilized to determine whether additional parameters should be added to the initial structural model. Figure 3 presents

Table 5.

Latent Factor Intercorrelations

Factor	1	2	3	4	5	6	7	8	9	10	11	12
1. Perceived SES	---	.131	.179	.040	-.278	-.312	.132	.246	.292	-.170	-.103	-.170
2. Friends School Adjust.	---	---	.541	.261	-.085	-.111	.807	.435	.346	-.014	-.074	-.064
3. Friends School Perf.	---	---	---	.219	-.125	-.150	.466	.629	.419	-.085	-.106	-.099
4. Family Academic Supp.	---	---	---	---	-.086	-.075	.308	.245	.310	-.054	-.075	-.049
5. Parent Education Level	---	---	---	---	---	.147	-.076	-.224	-.265	.158	.091	.122
6. Resource Barriers	---	---	---	---	---	---	-.114	-.204	-.222	.947	.617	.736
7. School Adjustment	---	---	---	---	---	---	---	.573	.455	-.015	-.077	-.068
8. School Performance	---	---	---	---	---	---	---	---	.582	-.133	-.150	-.158
9. Educational Expect.	---	---	---	---	---	---	---	---	---	-.192	-.163	-.178
10. Family of Origin Bar.	---	---	---	---	---	---	---	---	---	---	.623	.637
11. Relationship Barriers	---	---	---	---	---	---	---	---	---	---	---	.535
12. Personal Choice Bar.	---	---	---	---	---	---	---	---	---	---	---	---

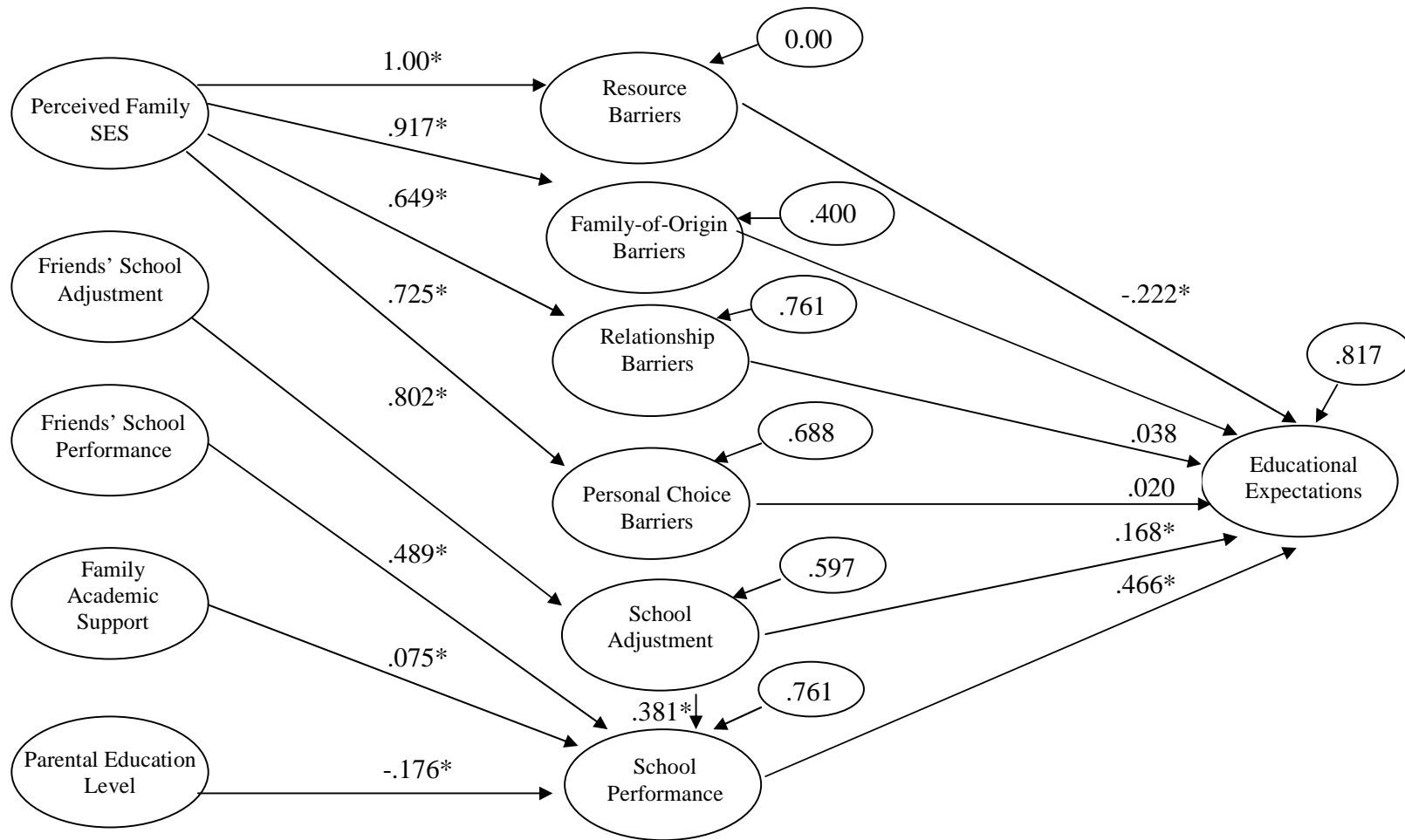


Figure 2: Initial structural equation model results for the calibration sample.

*Asterisked coefficients are significant at the $p < .05$ level.

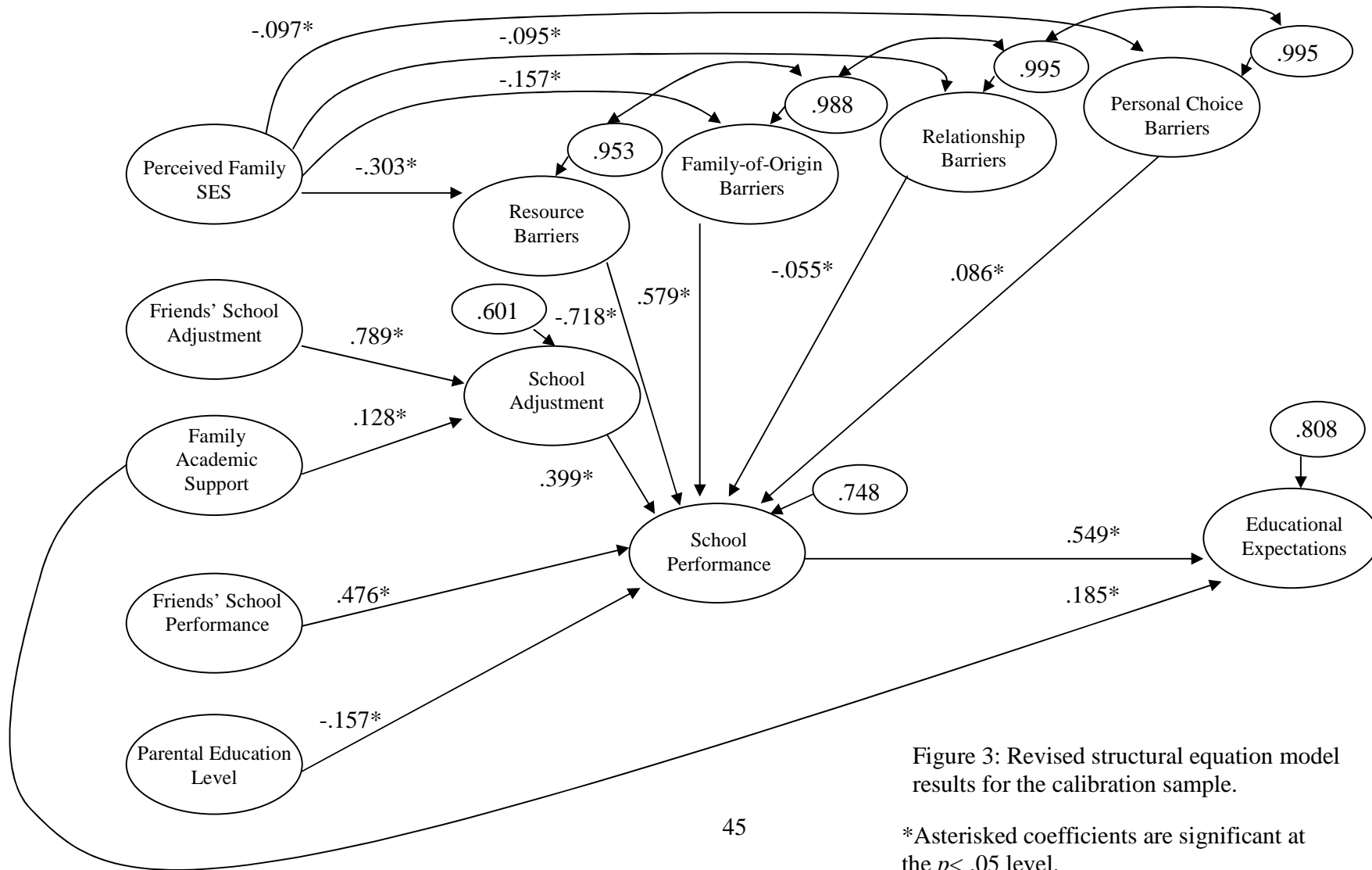


Figure 3: Revised structural equation model results for the calibration sample.

*Asterisked coefficients are significant at the $p < .05$ level.

the revised structural model. In both the hypothesized model and the revised structural model, Perceived Family SES has an indirect relationship to Educational Outcomes through the Barrier Factors, supporting Hypothesis 1.

The primary difference between the original hypothesized model and the revised model was that the model achieved a better fit to the data set when the relationships of all the Barrier Factors and School Adjustment on Educational Expectations were specified to be indirect effects through the latent factor of School Performance. This finding partially supports Hypothesis 5, which stated that Perceived Barriers, School Adjustment, and School Performance, would all directly relate to Educational Expectations. However, in the revised model, only School Performance and Family Academic Support directly related to Educational Expectations.

In the revised structural model, no changes were made to the predicted relationships between Friends' School Adjustment and School Adjustment, and Friends' School Performance and School Performance, respectively. Therefore, Hypothesis 3 was fully supported in the revised structural model.

In the revised structural model fit was also improved when School Adjustment had only an indirect relationship to Educational Expectations through School Performance as well. This partially contradicts Hypothesis 4, which stated that School Adjustment would have both a direct relationship to Educational Expectations and an indirect relationship to Educational Expectations through School Performance. Therefore, Hypothesis 4 was partially supported as School Adjustment only had an indirect relationship to Educational Expectations through School Performance.

Model fit was further improved when Family Academic Support directly related to School Adjustment, as opposed to School Performance, as well as relating to Educational Expectations directly. This alteration is relevant to Hypothesis 2, which stated that the effects of Family Academic Support and Parental Education Level would be indirectly related to Educational Expectations through School Performance. Therefore, partial support was found for Hypothesis 2 as only Parental Education Level was significantly related to School Performance in the revised structural model.

The last alteration to the initial hypothesized model was that the disturbance terms of the four barrier factors were allowed to covary. When the LM Test indicates that model fit will be improved by allowing disturbance terms to covary, it often means that a third unmeasured variable is accounting for their shared variance. After making these revisions based on both statistical and theoretical considerations, the revised structural model achieved a fit of .860, according to the robust CFI. While this represents an improvement over the initial hypothesized model, it still does not meet the standard criterion of a fit of .900.

Despite the fact that the ideal cutoff for fit was not reached, the revised structural model was then tested on the validation sample to ensure that the fit found among the observed variables and the latent factors was not over-inflated due to the unique characteristics of the calibration sample. When the revised structural model was tested on the validation sample, the Robust CFI attained was also .860. Table 6 presents the fit indices for the Independence Structural Model, the Initial Hypothesized Structural Model, the Revised Structural Model, and the Revised Structural Model fit for the validation sample.

Comparison of Model Fit across Gender

The next step in the analysis was to test for measurement invariance across the male and female subsamples. In testing for measurement invariance, one is assessing whether or not factor loadings and measurement errors are equivalent across different groups of participants. If measurement invariance is not present, it suggests that there are systemic differences in the ways that the separate groups of participants responded to the survey questions, such that the latent factors were not measured equivalently across the two groups. In a multi-group comparison, measurement invariance is tested for before any tests for structural invariance are conducted, to rule out significant measurement differences between the two groups. If measurement invariance is not found, structural differences are not tested for, due to the confounding influence of the significant measurement differences. However, in such cases, each group of participants can be treated as an independent data set, and examined to see if the covariance matrix suggests different structural models for each individual data set.

Table 6
Fit Statistics for the Independence, Initial, Revised, and Validation Sample Structural Models

Model	χ^2	<i>df</i>	NFI	CFI	$\chi^2\Delta$	<i>p</i>
Independence	530,707.22	435	---	---	---	---
Initial	67,790.06	390	.820	.821	---	<.001
Revised	53,033.93	384	.859	.860	14,756.13	<.001
Validation	53,346.31	384	.859	.860	---	<.001

To start, the initial calibration sample was divided into two data subsets, one containing all of the male participants, and the other containing all of the female participants. The two data sets were then subjected to a multi-group analysis in EQS (version 6.1) using the *GROUPS* sub-command. In the first run, no constraints were

imposed between the two groups, and a single Chi-square value was given for both data sets, in this case: $\chi^2(678) = 37,767.94, p < .001$. The NFI for the baseline multi-group measurement model was .899, and the CFI was .901.

To determine whether or not the latent factors in the current model were measured equivalently across males and females in the sample, a second EQS analysis was conducted in which the factor loadings of each observed variable onto its respective latent factor was constrained to be equal across the two groups. If no measurement variance is present, then the Chi-square difference test would be non-significant when comparing the baseline Chi-square value to the constrained Chi-square value. The constrained Chi-square value attained was: 39,266.50, with $df = 708$. The difference between the two Chi-square values was: $\chi^2(30) = 1498.56, p < .001$. The significant result from the Chi-square difference test suggests that the latent factors in the model were not measured equivalently across the two groups. Furthermore, the univariate tests of the individual constraints indicated that 20 out of 30 of the factor loadings were significantly different between males and females. In addition, two items, father's educational level and mother's educational level, were unable to be tested due to numerical problems. Therefore, tests of structural invariance between the two genders were not conducted. However, the two groups were examined as separate data sets to determine whether sources of improved fit could be found for each of the two groups. Table 7 compares the fit indices for males and females on the revised structural model.

The Chi-square results for males and females indicated that the structural model was a slightly better fit for males than females. To follow-up on the Chi-square results comparing the structural model between males and females, the regression coefficients of

Table 7
Fit Statistics for the Revised Structural Model across Gender

Model	χ^2	df	NFI	CFI	p
Females	28,027.55	384	.844	.846	<.001
Males	25,010.59	384	.872	.873	<.001

the standardized solution for the male sample and the female sample were compared to each other. Comparing the regression coefficients of the standardized solution across gender revealed differences in the degree to which resource barriers and family-of-origin barriers were related to school performance. Specifically, for males, the regression coefficient for resource barriers loading onto school performance was -.876 and the regression coefficient for family-of-origin barriers loading onto school performance was .715. In comparison, for females, the regression coefficient for resource barriers loading onto school performance was -.601 and the regression coefficient for family-of-origin barriers loading onto school performance was .476.

In addition, for both genders, further examination of the SEM analysis indicated that the overall structural model fit could be improved by adding additional pathways between latent constructs and allowing disturbance terms to covary. However, the suggested pathways, while statistically significant, were not consistent with the theoretical considerations being examined in the current paper. For example, for both genders, fit would be improved if a pathway was added from educational expectations to school performance. This addition would create a recursive pathway between these two latent factors, thereby negating the role of educational expectations as the outcome variable of interest.

Overall, the comparison of model fit across gender suggests that there are significant differences in the fit of the structural model across gender, supporting Hypothesis 6. However, these results must be viewed with caution due to the confounding influence of measurement variance.

Comparison of Model Fit across Ethnic Groups

As with the comparison of model fit across gender, to compare across the three ethnic groups of African-American, European-American, and Hispanic-American youth, a baseline comparison was conducted in EQS to obtain an initial assessment of fit. A second analysis was then conducted in which the factor loadings of each observed variable were constrained to be equal across the three groups. Ideally, no significant differences would be found between the baseline and the constrained Chi-square values. In the current analysis, the baseline Chi-square value was: 48,759.23, with $df = 1017$. The constrained Chi-square value was: 49,614.04, with $df = 1077$. The difference between the two Chi-square values was: $\chi^2(60) = 854.81, p < .001$. As with the comparison across gender, the significant Chi-square difference test indicated that there was significant measurement variance between the three different ethnic groups. An examination of the univariate test statistics indicated that of the 90 constraints imposed, 48 of them were significant, indicating that they were unjustifiably imposed. Furthermore, six of the constraints were not tested due to numerical problems (these constraints represented the observed variables of father's educational level and mother's educational level held constant between the three ethnic groups). These results suggest that some of the survey questions used to measure the observed variables were interpreted differently by members of the three different ethnic groups. Therefore, each

of the three groups was treated as a separate data set to determine if the structural model fit could be improved for each of them. Table 8 compares the fit of the revised structural model across the three ethnic groups.

Table 8.

Fit Statistics for the Revised Structural Model across Ethnicity

Model	χ^2	df	NFI	CFI	p
African-Americans	6,668.92	384	.873	.879	<.001
European-Americans	53,033.93	384	.859	.860	<.001
Hispanic-Americans	8,289.61	384	.863	.868	<.001

A comparison of the fit statistics across the three ethnic groups indicates that the structural model was a significantly better fit for the African-American and Hispanic-American subsamples. The regression coefficients of the three sub-samples were compared. One regression equation indicated that there were notable differences in the strength of relationships between the latent factors in the structural model. The regression equation that differed between the three ethnic groups was the regression of Resource Barriers and Family-of-Origin Barriers onto School Performance. For African-American students, the respective values were -1.96 and 1.78. For European-American students, the respective values were -.718 and .579. For Hispanic-American students, the respective values were -.958 and .883. Overall, these results suggest that the three different ethnic groups weighted the barriers differently as obstacles to their school performance. For example, minority students perceived Resource Barriers to be more problematic to their school performance compared to European-American students.

Furthermore, differences in the results between the three ethnic groups also emerged when the Wald test for freeing (eliminating) pathways between latent factors was

examined. For African-American students, the Wald test indicated the model fit could be improved by freeing the pathways between Perceived Family SES and Relationship Barriers, Perceived Family SES and Personal Choice Barriers, and Relationship Barriers and School Performance. To follow up, each parameter was released individually, starting with the pathway between Relationship Barriers and School Performance. With this parameter released, the NFI remained stable at .873. However, when the pathway between SES and Relationship Barriers was released, the NFI dropped to .867. Furthermore, when the pathway between SES and Personal Choice Barriers was released, the NFI dropped to .861.

For the Hispanic-American students, the Wald test indicated that model fit could potentially be improved by removing the path from Personal Choice Barriers to School Performance. In this instance, when that pathway was removed for the Hispanic-American sample, model fit remained stable (for example, the NFI remained constant at .863). Finally, similar to the results for the across-gender comparison, the SEM analysis indicated that fit of the structural model could be improved in all three subsamples by adding additional pathways between latent constructs and allowing disturbance terms to covary, which did not agree with the theoretical background of the proposed model.

Overall, the comparison of model fit across ethnicity suggests that there are significant differences in the fit of the structural model across ethnicity, supporting Hypothesis 6. However, these results must be viewed with caution due to the confounding influence of measurement variance.

Chapter IV: Discussion

This study used structural equation modeling to test the relationship between a number of family factors (Perceived Family SES, Family Academic Support, and Parental Education Level), peer factors (Friends' School Adjustment and Friends' School Performance), perceived barriers (Resource Barriers, Family-of-Origin Barriers, Relationship Barriers, and Personal Choice Barriers), and individual factors (School Adjustment and School Performance) on the outcome of adolescents' Educational Expectations. The test of the initial measurement model indicated that model fit could be improved by dividing up the Perceived Barrier construct (an eight-item latent construct) into four separate latent constructs (each measured by two observed variables). When this alternative model was tested, the measurement model achieved an acceptable level of fit.

The primary findings of the structural model analysis indicated that the proximal correlates of Educational Expectations were School Performance and Family Academic Support. School Performance, in turn, was related to Friends' School Performance, School Adjustment, and Resource Barriers. Resource Barriers, as predicted, was strongly related to Perceived Family SES. The results also support the premise of Peer Cluster Theory, as Friends' School Adjustment was significantly related to the students' own School Adjustment, and Friends' School Performance was significantly related to the students' own School Performance. Also, although the SEM results suggest that there are

differences in the structural model fit across gender and ethnicity, those results must be interpreted with caution due to the measurement variance found across gender and ethnicity. The results relevant to each hypothesis are discussed separately below.

Hypothesis 1 stated that family SES would have an indirect relationship to Educational Expectations through the latent factor of Perceived Barriers. Hypothesis 1 was partially supported as can be seen in Figure 3. In the revised structural model, which had improved fit compared to the initial structural model, the relationship of SES to Educational Expectations was indirect, with the four types of perceived barriers acting as intermediary factors. However, the barriers themselves did not directly relate to Educational Expectations. Rather, their relationship was also indirect through the latent factor of School Performance. The strongest pattern of relationships that emerged in the revised structural model was that Perceived Family SES directly relates to Resource Barriers, and Resource Barriers negatively relates to School Performance. Previous research has documented the relationship between SES and educational and career expectations, finding that students from low SES backgrounds often have lower educational and career expectations (Rojewski & Yang, 1997; Trusty, 1998; Whiston & Keller, 2004). The results found here indicate that one pathway by which SES could relate to Educational Expectations is through School Performance. Students who feel that their family does not have the money to put them through school, or that there are no financial opportunities in their community perform less well academically. Although speculative, financial hardships could relate to a number of individual motivational characteristics in students, such as whether they prioritize their education, and whether they possess a feeling of hope for their future. These, in turn, could affect their school

performance through their level of motivation to do well. For example, students from lower SES backgrounds may prioritize part-time or full-time work over completing their high school education. In such a scenario, grades become less important than the immediate need of financial support.

The other three types of barriers have weaker and less clear cut relationships with the latent factors of Perceived Family SES and School Performance. Regarding the pathways between Perceived Family SES and Family-of-Origin Barriers, Relationship Barriers, and Personal Choice Barriers, while the coefficients were in the hypothesized direction (negative), they were comparatively small (ranging from -.095 for Relationship Barriers to -.157 for Family-of-Origin Barriers). Theoretically, this is logical as some of the items used to assess these factors are not necessarily strongly linked to socioeconomic status. For example, for Personal Choice Barriers, the two items used to assess this item were that ability to get the desired job as an adult would be impeded by "*I wouldn't try hard enough*" and "*My drug or alcohol use.*" The comparison across ethnic groups also suggested that the Relationship Barriers and Personal Choice Barrier items were interpreted differently across the three ethnic groups. These findings are covered in more detail under the discussion of Hypothesis 6.

Regarding the pathways between the remaining Barrier items and School Performance, Relationship Barriers were also negatively related to School Performance, albeit weakly (coefficient = -.055). In this case, School Performance was negatively related to the Perceived Barrier of Relationship Barriers, which in this case was measured by asking the students about the prospect of marriage or having a child. Given the age of the sample (median age = 13 years old), it is assumed that very few of the students had

actually experienced either of these events. Therefore, in this case, it is important to emphasize that these were more likely perceived barriers, as opposed to experienced barriers. In this case, students who perceived that marriage or having a child would be a barrier to their career goals had slightly poorer academic performance. This finding adds to the current body of literature on Educational Expectations, in that it suggests that even perceived barriers could negatively impact student academic performance. As academic performance falls for such students, their expectations for poor performance are reinforced, and the interplay between the two variables may become mutually reinforcing.

Interestingly, Family-of-Origin Barriers was positively related to School Performance. This finding indicates that for the student sample, feeling that they “did not want to move away from [their] family,” and “[their] family needs [them] to work at home,” actually had a positive relationship with their School Performance. This result indicates that rather than acting as a barrier, these issues could act as a protective factor of students’ school performance. In this case, it is plausible that these items are actually a proxy for family cohesion, such that junior high school students who feel a combination of closeness to their family members (that would prevent them from wanting to move away) and responsibility for contributing to the family finances, perform better in school. Such an interpretation fits with previous literature that found that family involvement is a significant predictor of adolescent career development (Hill et al., 2003; Trusty, Watts, & Erdman, 1997).

Furthermore, the latent factor of Personal Choice Barriers was (unexpectedly) positively related to School Performance. There is some evidence that this item was

interpreted differently by students of different ethnic backgrounds, which is discussed in more detail under Hypothesis 6.

Hypothesis 2 stated that the family socialization variables of Family Academic Support and Parental Education Level would have an indirect relationship to Educational Expectations through School Performance. Hypothesis 2 was partially supported. While the relationship of Parent Education Level on Educational Expectations was indirect through school performance as predicted, Family Academic Support did not indirectly relate to Educational Expectations through the latent construct of School Performance. Rather, Family Academic Support indirectly related to Educational Expectations through School Adjustment, and also contributed to the explained variance of Educational Expectations directly. Interestingly, the relationship found between parental educational level and school performance was in the opposite direction than expected. The results indicated that there was a negative relationship between Parental Education Level and School Performance, which would indicate that students whose parents had higher education levels performed less well in school. This is contrary to the proposed hypothesis and contradicts the findings of previous literature. For example, previous research has found that parent education level positively predicts adolescents' adult career attainment (Schoon, 2001), and influences occupational decision-making (Behnke et al., 2004; Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002; Schmitt-Rodermund & Vondracek, 2002). Furthermore, it has been found that parents who have attained a higher level of education have been found to hold higher expectations for their children's academic performance compared to parents who have a lower level of education (Raty, Leinonen, & Snellman, 2002). The current findings are, unfortunately,

confounded due to measurement problems in assessing the latent construct of Parent Education Level. This limitation is discussed in more detail in the *Limitations* subsection at the conclusion of this chapter.

Unlike Parental Education Level, the relationship of Family Academic Support to Educational Expectations was not indirect through School Performance. Instead, the structural model achieved a better fit when a path was added from Family Academic Support to School Adjustment, and a path was added directly to Educational Expectations. In hindsight, these alterations to the specified model make conceptual sense based upon the reviewed literature. For example, Kracke (2002) found that students with higher levels of family academic support spent more time exploring different career options, and Hargrove et al. (2002) found that students with higher levels of family academic support possessed higher levels of career planning self-efficacy. While neither of those outcomes is identical to school adjustment, for a younger sample of students such as was used in the current study, school adjustment is a similar, and perhaps more age-appropriate construct to examine in this context. Additionally, other authors have found that students' perceived parental support was a direct predictor of students' academic expectations (Ali & Saunders, 2006), a finding which was replicated in the current study.

Hypothesis 3 stated that the peer socialization variables of Friends' School Adjustment and Friends' School Performance would have an indirect relationship to Educational Expectations through School Adjustment and School Performance, respectively. Hypothesis 3 was fully supported. As predicted by peer cluster theory (Oetting & Beauvais, 1986, 1987), Friends' School Adjustment was a significant

predictor of a student's own School Adjustment, and Friends' School Performance was a significant predictor of a student's own School Performance. This finding reinforces the importance of considering peer influences on adolescents' Educational Expectations and outcomes.

Hypothesis 4 stated that School Adjustment would have an indirect relationship to Educational Expectations through School Performance. Hypothesis 4 was not supported. School Adjustment was fully (not partially, as predicted) indirect through the latent construct of School Performance. Although previous research has documented that students with low school adjustment have lower occupational expectations (Rojewski & Hill, 1998), the current findings indicate that School Adjustment is related to Educational Expectations through School Performance. This finding is in agreement with the results reported by Parsons et al. (1982), who found that teachers' feelings towards students, which was part of school adjustment in the current analysis, influenced student performance. This finding is also in line with the perspective of Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994, 1996, 2000), in that teachers' feelings towards students are one part of the complex social messages that adolescents receive about their capabilities and probability of success. These factors could in turn affect students' feelings of self-efficacy as they relate to educational and career goals. In essence, students who receive negative messages about their probability of success from their teachers are going to have lower School Adjustment, which then leads to lower School Performance. Unfortunately, as School Performance drops, and the teachers' negative messages are reinforced, the interplay between the factors of School Adjustment and School Performance becomes a self-fulfilling prophecy.

Hypothesis 5 stated that the effects of Perceived Barriers, School Adjustment, and School Performance would be directly related to Educational Expectations. Hypothesis 5 was largely unsupported. Whereas it was predicted that the Perceived Barriers factors, School Adjustment, and School Performance would all be significantly related to Educational Expectations, model fit was improved when the effects of all of the Barrier factors and School Adjustment on Educational Expectations were considered indirect effects through the latent factor of School Performance. Thus, in the final revised structural model, the only prediction from Hypothesis 5 that was supported was the fact that School Performance was directly related to Educational Expectations. This finding is in line with previous research. For example, Rojewski and Kim (2003) found that adolescents who anticipated going on to college had higher scores on subject matter achievement tests compared to their peers who did not anticipate going onto college. The current findings also add to the body of literature on adolescent educational expectations by indicating that many other variables that have been found to be related to the outcome of educational expectations are actually indirectly related to the outcome of interest through school performance. For example, a number of research studies have found a relationship between parent education level and children's educational expectations (Ali & Saunders, 2006; Behnke et al., 2004, Mortimer et al., 2002; Rojewski & Kim, 2003; Schmidt-Rodermund & Vondracek, 2002). The current study found that a likely mechanism to explain the relationship through Parental Educational Level and adolescents' Educational Expectations is the former's effect on School Performance.

Hypothesis 6 stated that the fit of the hypothesized structural model may vary by gender and ethnicity of the participants. Regarding Hypothesis 6, there is some evidence

that this hypothesis was supported, but it must be interpreted with caution due to the confounding influence of measurement variance found across the groups. While measurement variance was found across the demographic variables of gender and ethnicity, few patterns of identifiable structural differences emerged in the analysis. One finding that merits discussion in this regard is the fact that when the revised structural model for each ethnic group was tested individually, some evidence emerged that two of the barrier factors were perceived differently across the three ethnic groups. Specifically, in the structural analysis for the African-American sample, the Wald test suggested that the pathway between Relationship Barriers and School Performance could be eliminated without sacrificing model fit, creating a more parsimonious structural model. Similarly, for the Hispanic-American sample, the Wald test suggested that the pathway between Personal Choice Barriers and School Performance could be dropped without decreasing the model fit. Although the results must be viewed cautiously due to the overall lack of fit in the structural model, these findings do suggest that the constructs of Relationship Barriers and Personal Choice Barriers may not actually be perceived as barriers to African-American and Hispanic-American students' respective school performance goals. On the one hand, these findings are in line with those of Hill et al. (2003), who reported that Mexican-American students were less likely to perceive barriers to their success, with the predominant barrier being perceived financial considerations. For African-American students, previous research has found that a common perceived barrier for this group is a lack of family support (Hill et al., 2003). The current finding that Relationship Barriers could be eliminated as a predictor of School Performance may

indicate that students perceive marriage and parenthood as a potential source of social support, as opposed to an obstacle to their goals.

Another finding meriting discussion regarding differences across the three ethnic groups is the comparison of standardized regression coefficients from the standardized solution. These results tentatively indicate that African-American and Hispanic-American students feel that Resource Barriers are more dominant obstacles to their school performance compared to European-American students. These findings are also in agreement with findings from previous literature which found that European-Americans are less likely to perceive their financial situation to be a barrier (Hill et al., 2003). Interestingly, however, the coefficients for Family-of-Origin Barriers were positive for all three ethnic groups, and the coefficient was largest for African-American students, followed by Hispanic-American students, and then European-American students. This finding suggests that the construct of Family-of-Origin Barriers had a positive effect on School Performance, and that effect was stronger for ethnic minority students compared to ethnic majority students. Keeping in mind that these results must be viewed tentatively, one possible explanation for this finding is the stronger sense of family that some ethnic minority students experience compared to their ethnic majority counterparts (Chunk, Baskin, & Case, 1999; Gomez et al., 2001; Pearson & Bieschke, 2001).

Hypothesis 6 also stated that the fit of the structural model may vary by gender of the participants. Although the Wald test did not indicate that the model fit could be improved by dropping parameters for the male sample or female sample, comparison of the standardized regression coefficients of the standardized solution did find differences

by gender on one regression equation. Similar to the findings for comparisons across ethnicity, an informal comparison of the standardized regression coefficients indicated that Resource Barriers and Family-of-Origin Barriers differed in the strength of their relationship to School Performance by gender. Males perceived Resource Barriers to be a stronger negative factor that impacted their School Performance compared to females, and males perceived Family-of-Origin Barriers to be a stronger positive factor that impacted their School Performance compared to females. The finding regarding Resource Barriers and School Performance is in line with previous research that found that males tend to be more concerned with attaining a prestigious and high-paying career compared to females (Reyes et al., 1999). Therefore, young men may be more acutely aware of the ways in which coming from a lower SES background puts them at a disadvantage for attaining their school performance and educational goals. Interestingly, young men perceived Family-of-Origin Barriers to be more strongly positively related to their School Performance compared to young women. One possible explanation for this finding is that, like minority students, young men felt that these questions reflected a measure of family strength or parental interest in their academic life, and this interest translated into a positive influence on their school performance.

Implications of Findings

Looking only at relationships that have a nontrivial effect size, the major findings in the current analyses are: Perceived Family SES is related to Resource Barriers, Resource Barriers are related to School Performance, Friends' School Adjustment is related to School Adjustment, Family Academic Support is related to School Adjustment, Friends' School Performance is related to School Performance, School Adjustment is related

to School Performance, Family Academic Support is related to Educational Expectations, and School Performance is related to Educational Expectations. See Figure 4 for a graphical depiction of the substantially significant results from the current study. These findings suggest that practitioners who would like to improve students' educational expectations have to take a number of factors into consideration. They also suggest that there are several avenues by which educational expectations can be influenced. For example, school psychologists and social workers working with low-income students can influence School Performance, and Educational Expectations in turn, by raising students' awareness of school resources that are available to them. Many schools have guidance counselors who can educate low income students on grants and scholarships available to low-income students that offset the financial burden of a college education. At the high school level, many schools and communities also participate in fund raisers that provide low income students with basic school supplies such as backpacks if their families qualify. Raising awareness of available resources may help students who perceive that a lack of resources will be a real challenge to completing or furthering their education.

Another avenue of influence is through the family. Family Academic Support influences two important constructs: School Adjustment and Educational Expectations. For practitioners who are working directly with a student population, it is important to recognize that family support (or a lack thereof) is a significant predictor of how well (or unwell) students will fit into the academic environment, and what educational goals they will set for themselves. To change students' opinions of what they can achieve, it may be necessary to discuss with students what kinds of messages they receive at home regarding their education. Like family, peers are also a strong influence on the students' own

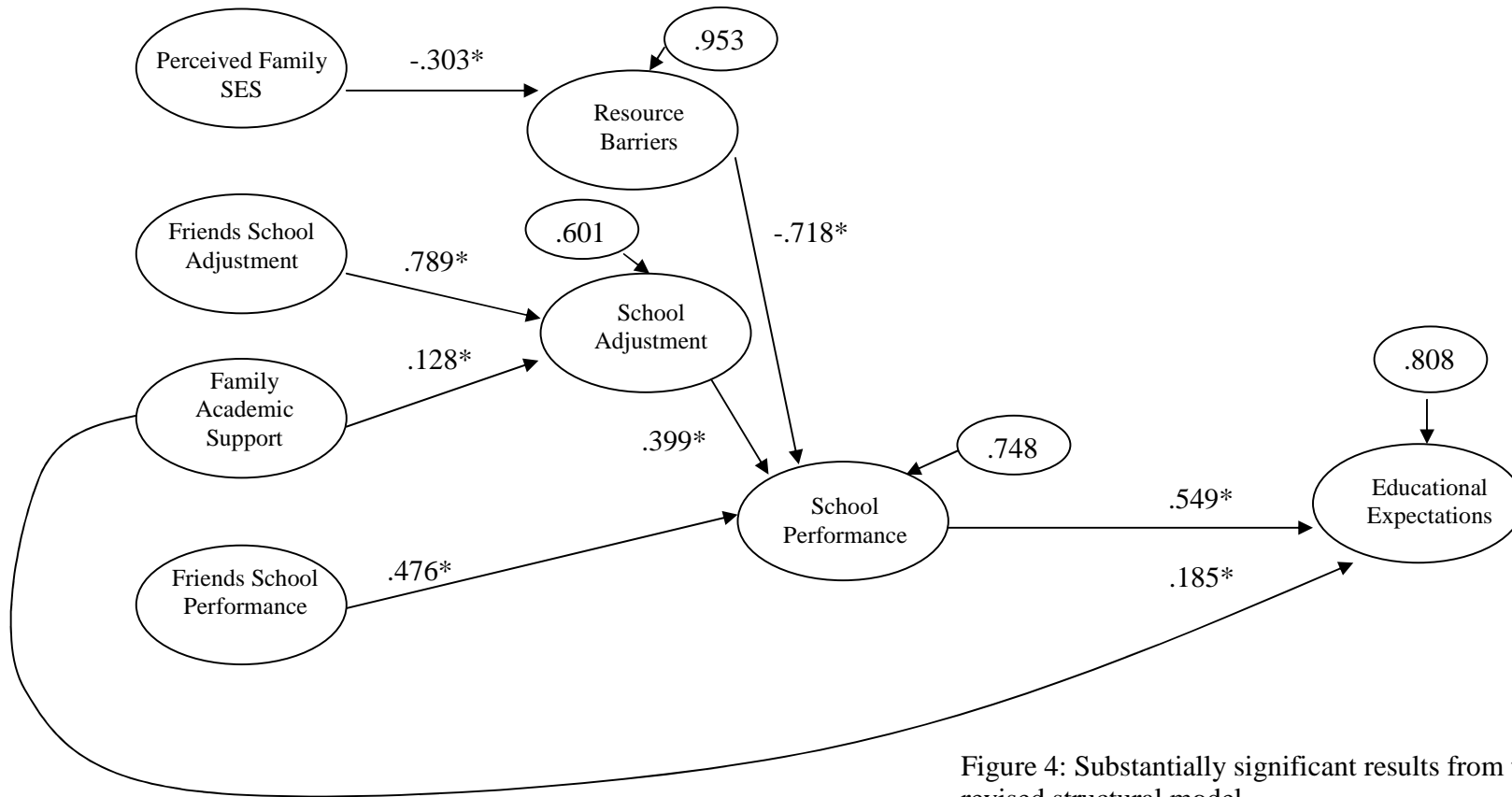


Figure 4: Substantially significant results from the revised structural model.

outcomes. Specifically, peer school adjustment and peer school performance are strong, significant predictors of the students' own school adjustment and school performance. The influence that peers exert on individual behavior has been studied extensively in relation to adolescent drug use. Educators and researchers, then, should already be familiar with the psychological dynamic that is created amongst a small group of close-knit adolescents in the school setting. The current results imply that this dynamic is not exclusively in effect regarding adolescent substance abuse; it also impacts the students' school related attitudes and behaviors. This is an important implication because professionals working in a school environment may have very little influence regarding the effect of family influences. However, school can be more pro-active in influencing negative peer dynamics on their campuses.

Another major contribution of the current study is the finding that almost all other latent factors indirectly relate to Educational Expectations through School Performance. Students who perform less well in school have lower educational expectations for themselves. While this finding is logical, it has been largely overlooked in previous literature. One avenue to improve students' chances of graduating high school, and going onto college, is to show them that they can succeed in school. This finding is in line with SCT theory (Bandura, 1986), which posits that self-efficacy is increased when an individual has the opportunity to succeed at domain relevant tasks. Ideally, to improve self-efficacy the tasks are perceived as somewhat challenging, but not challenging to the point that they are seen as overwhelming. Thus, educators and other school professionals who would like to increase students' Educational Expectations through School Performance, could design a scaffolding educational technique in which students are

coached through academic problems (related to specific subjects: math, biology, history, literature, etc.) that incrementally increase in difficulty, thereby increasing their self-efficacy.

Limitations

The current study set out to add to the literature on adolescent educational expectations using a structural equation modeling approach. However, as with any research endeavor, the current results must be interpreted carefully due to the limitations of the study. One limitation is that the data were cross-sectional (and, therefore, correlational) in nature. Due to this fact, it is important to keep in mind that what was being analyzed in the current study was the pattern of co-variation among the survey items, which were conceptualized to form the specific latent constructs presented in this study. Therefore, while the current study sheds light on specific relationships between the constructs identified and studied herein, no causal conclusions can be drawn from the results. For example, while the current paper found that School Performance is a strong, significant predictor of Educational Expectations, it would be inappropriate to state that School Performance *causes* students' Educational Expectations.

Another important issue relevant to the interpretation of the results is the relationship between sample size and power. One of the strengths of the current endeavor is that it utilized a large, nationally representative sample of junior high school students. Therefore, the trends found in the current study can probably be seen as an accurate representation of outcomes for American junior high school students. On the other hand, the fact that such a large sample was utilized makes it important to differentiate between results that are statistically significant versus substantially significant (for a detailed

discussion, see Agresti & Finlay, 1997). This is due to the fact that as sample size increases, power increases, and greater power allows one to detect significant results that have very low effect sizes. In fact, with a sample as large as the current one, it could be argued that some of the results that were determined to be statistically significant were not *substantially significant*, and that the low coefficient values would have been statistically nonsignificant given a smaller sample size. For example, in the revised structural model, the coefficient between Relationship Barriers and School Performance was found to be significant, despite its effect size of only .003. Therefore, in the current study it is important to look beyond statistical significance, and examine the size of the coefficients to determine which results were actually meaningful.

An additional limitation of the current study was the relatively poor fit found for the measurement model. Although the revised measurement model did achieve an adequate fit (Robust NFI = .901; Robust CFI = .902), the fit was less than ideal, especially when one takes into consideration that the fit of the measurement model acts as a ceiling for the maximum fit attainable by the structural model. Overall, the statistics from the measurement model indicate that some items were not adequately differentiated from each other. For example, for the measurement model, the Lagrange Multiplier Test (LMT) for adding parameters repeatedly recommended allowing the School Adjustment items to load onto the latent factor of School Performance. This suggests that the latent factors of School Adjustment and School Performance need to be more clearly defined by their respective survey items in future studies. Another example is that LMT results also suggested allowing students' School Adjustment items to load onto the latent factor of their Friends' School Adjustment. Due to the fact that these additional parameters would

have confounded the meaning of the latent factors being examined, they were not added to the measurement model, thereby capping the model fit that was able to be achieved in the current study.

A related limitation to the current study is that several of the latent constructs included in the model may not have been measured by an adequate number of survey items. For example, Byrne (1994) recommends that researchers use a minimum of three observed variables to measure each latent construct. Unfortunately, due to the fact that the current study utilized a pre-existing data set, the current author was limited to utilizing the particular survey instrument that had been used to collect the original data. Using a pre-existing data set limited both the breadth of variables that could be included in the current analysis, as well as the specific questions that were used to measure the latent factors included in the study. Given that the survey instrument was not designed with the specific requirements of structural equation modeling in mind, the current study had to contend with the fact that several of the latent constructs were limited to two observed variables.

Of particular difficulty in the current study was the latent factor of Parental Education Level. This factor was measured by two survey items, which read: What grade in school did your father complete? and What grade in school did your mother complete? Students were instructed to fill in one of the following options: *I don't know, 6th or less, 7, 8, 9, 10, 11, 12, 1 year of college, 2 years of college, 3 years of college, 4 years of college, 5 years or more of college*. Unfortunately, of the survey items utilized in the current study, these two questions ranked fairly high in the percentage of missing data for each question (4,917 cases or 12.9 % for father's education level; 5,359 cases or 14% for

mother's education level). Although the EM imputation method in EQS version 6.1 was utilized to fill in missing data with estimated values, the combination of imputing such a large percentage of cases with the fact that the latent construct of interest was only measured by two survey items proved to be problematic statistically. For example, the fact that Parental Education Level was found to be negatively related to School Performance was an unexpected finding, and one that is plausibly untrustworthy.

Moreover, it is important to keep in mind that SEM does not indicate whether the "correct" structural model has been identified. Even if the revised structural model tested here had achieved a higher level of fit to the observed data, it would have still been possible that an alternative model would have fit the observed data more effectively. For example, not only could a different configuration of variables fit the data set more closely, it is common that adding additional latent constructs often improves model fit. Case in point, in the current study, model fit was improved by allowing the disturbance terms of the four Barrier factors to covary. According to Byrne (1994), when the LMT results indicate that disturbance terms should be allowed to covary, this often indicates that a third unmeasured latent factor would account for the shared variance among the latent factors. Thus, in the current study, there may be unmeasured factors, that if included in future studies, would improve model fit substantially.

Overall then, we cannot conclude whether the current model presented here within is the "right" or "wrong" model; all we can conclude is the degree to which this particular configuration of latent factors fits this data set. Overall, the level of structural model fit achieved was inadequate. However, despite the overall lack of fit, the pattern of relationships found was in line with previous research, and can contribute to our

understanding of how these factors fit together to affect students' educational expectations.

Future Directions

Future research on adolescents' educational expectations can build off of the findings presented in the current study. Of particular importance in the current study was the effect of peers' influence on students' own outcomes. These findings are in line with peer cluster theory (Oetting & Beauvais, 1987), which suggests that peer clusters mutually reinforce social norms within their social group, and SCCT (Lent, Brown, & Hackett, 1994, 1996, 2000), which suggests that peers are important rolemodels, especially during the adolescent years when children are breaking away from the influence of their parents.

The other major contribution this study makes to the body of literature on educational expectations is the finding that a variety of influences on students' educational expectations are indirect through the latent factor of school performance. This includes financial barriers, family influences, peer influences, and school adjustment factors. Theoretically, this finding is logical. If a student expects to graduate from high school and to go onto college, it would be necessary for her or him to have a certain minimal level of performance to achieve those goals. The ways in which financial factors, family factors, peer factors, and school adjustment factors would act to help or hinder students' progress towards those goals is most likely through their performance, as was found here. Therefore, future research should include school performance as a factor of interest in their studies on adolescent expectations to examine whether this finding is replicated in other samples.

Furthermore, Family Academic Support also directly related to Educational Expectations. This finding illustrates the importance of considering the social environment in which a student is operating, including family influences. Previous research has found that parent/family influences can operate as both a positive (Ali, McWhirter, & Chronister, 2005; Trusty, 2001) and a negative (Whiston & Keller, 2004) influence on students' educational expectations. The current study indicates that research on students' educational expectations should continue to include measures of family support in their analyses of factors that influence students' educational outcomes.

Finally, future research studies that examine the outcome of students' educational expectations from a structural equation approach should take into account the limitations of the current study. It is important that the latent factors be adequately measured and clearly differentiated from one another in order to get a more accurate picture of how these factors fit together in students' experiences. Furthermore, longitudinal approaches are necessary to determine whether the relationships among the latent factors examined here are causal or just correlational.

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