

Family Processes, Individual Characteristics, and Adolescent Academic Achievement:  
A Study of the Ecology of Family-School Connections

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**Abstract**

Associations among family process variables, individual characteristics, and academic achievement were examined in a sample of 2321 seventh to twelfth grade high school students. Using data from the National Longitudinal Survey of Adolescent Health (Add Health), the present study investigated the direct and indirect associations among social-cultural variables, parent individual characteristics, general family relations, general parent-child interactions, school-focused interactions, adolescent individual characteristics, and academic achievement. Path analyses revealed that adolescent individual characteristics, namely intellectual ability, academic effort, and student aspirations, but not self esteem, established a clear direct association with school performance. Student race and parent education had small direct associations with earned grades. Numerous indirect associations among parent education, parental expectations, and family cohesion, through student characteristics, were also associated with academic achievement. The findings demonstrate a complex web of associations with adolescents' success in school.

Since the publication of Inequality: A Reassessment of the Effect of Family and Schooling in America (Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, & Michelson, 1972) American scholars have assessed a multitude of factors associated with children's school success. Investigators have frequently indicated that experiences within the family impact children's educational outcomes (Dornbusch & Ritter, 1990; Floyd, 1997; Lam, 1997; Martini, 1995; Muller, 1993). Studies on family variables that affect children's academic achievement have mainly focused on three areas: socio-economic status (SES) (Brookhart, 1998; Muller & Kerbow, 1993), parental expectations (Seginer, 1983), and general parenting styles (Dornbusch & Ritter, 1990; Paulson, 1994). The majority of research has been conducted on school-aged children, thereby neglecting the importance of family-school linkages in the adolescent years. Accordingly, this study will examine the various within-the-family processes and family member characteristics that influence academic achievement in adolescence.

Despite accumulated studies on the family's direct influence on youth's academic achievement, little is known about both the direct and indirect associations between the wider social-cultural environment, family processes, individual characteristics, and school performance. In order to develop a more encompassing picture of the various influences on academic achievement, the selection of variables for this study was guided by an ecological model of family-school connections that outlines six levels of contexts: exogenous social-cultural variables, parent characteristics, general family relations, general parent-child interactions, school-focused interactions, child characteristics, and child outcomes. The Family-School Relationships Model (Ryan & Adams, 1995) was used to organize the analysis of data

and to establish the myriad of factors that relate to the family's role in adolescent learning and success in school. In accordance with the levels of the model, this study explores the influences of (1) social-cultural contexts (parent education and student race), (2) parent individual characteristics (parental expectations), (3) family processes (family cohesion, parental warmth, parental monitoring, and talking about school), and (4) adolescent individual characteristics (self esteem, intellectual ability, academic effort, student aspirations, and problem solving skill), on academic achievement.

In addition to extending previous research, the aim of this study was to determine how processes in the system of family interactions have an impact on adolescents' achievement at school. A more complete understanding of the range of significant individual and family factors which affect adolescent academic achievement will give direction to policy-makers in developing approaches that support school success.

### **Literature Review**

The Family-School Relationships Model depicts a multitude of interlinking levels of potential influences from the family on academic achievement of children and adolescents. The following review of recent work illustrates the salient importance of several levels of potential influences.

#### **Individual Characteristics of the Adolescent**

Children's individual characteristics often emerge as important predictors of school success (Ryan & Adams, 1995). For example, numerous researchers have found a positive association between the personal characteristic of self esteem and academic achievement (Manscill & Rollins, 1990; Morvitz & Motta, 1992; Muijus, 1997). Manscill and Rollins (1990)

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reported a moderate positive association between self esteem and academic achievement among a large sample of high school students. Similarly, Muijus's (1997) study of grade 4 and 5 students revealed a relationship between self esteem and achievement, especially among boys. But other findings have failed to support the direct association between general self esteem and academic achievement. In her review of the literature, Wylie (1979) concluded that there is a relationship between academic self concept and achievement, but rejected the existence of a general self concept-to-achievement relationship. Similarly, Ryan, Corville-Smith, and Adams (1995) found that when child and family variables are examined in combination with self esteem, the direct relationship between the child's self esteem and academic achievement disappears. Further research is needed to clarify the findings surrounding the influence of self esteem on adolescent achievement.

A strong positive association has been established between intellectual ability and school grades (Fehrmann, Keith, & Reimers, 1987). Investigators have also reported a strong relationship between both intellectual ability and academic effort, in relation to school achievement (Ryan et al., 1995; Maruyama, Rubin, & Kingsbury, 1981). Moreover, Brookhart (1998) reported that both the effort that students apply to studying and their personal educational aspirations influence school performance. In a sample of Black high school students, moderate correlations were found between various measures of effort and self-reported grades, for both sexes (Dornbusch & Ritter, 1990).

Very little research has been conducted on the effects of students' problem solving skill on academic achievement. Portes, Zady, and Dunham (1998) examined the influence of parents' assistance on middle-school students problem solving ability and academic achievement. The

researchers found that a cooperative problem solving style of interaction between parent and child was significantly correlated with children's intellectual performance in school. Further investigation into the effects of problem solving skill on academic performance is warranted.

The evidence suggests that various individual characteristics, namely general self-esteem, intellectual ability, academic effort, educational aspirations, and problem solving skill may be useful in the predication of academic achievement.

### **Talking about School**

Parent-child interactions surrounding school-related issues have been linked in previous studies to academic achievement outcomes. There has been a considerable amount of research on parent-child school-focused discussions and academic success in recent years (Fehrmann et al., 1987; Keith, Troutman, Bickley, Trivette, & Singh, 1993; Muller, 1993). Using the National Education Longitudinal Survey of 1988 (NELS:88), Muller (1993) found that parent-adolescent discussions regarding current school experiences and high school programs were the strongest predictors of grades when achievement test scores were controlled. Keith et al. (1993) conducted a separate analysis of the same NELS:88 data to examine a parental involvement variable composed of parents discussing school experiences, high school plans, and post-secondary high school plans with their children. The researchers found that parental involvement was significantly related to achievement, especially in mathematics and social studies (Keith et al., 1993).

Although there is well-documented research on the direct effects of parent-child school-related interactions on achievement, researchers have also suggested that there are declines in school-focused interactions as children move into secondary school (Eccles & Harold, 1993).

Additional research is needed to determine whether parent-child school-related interactions continue to be an important source of achievement in the late adolescent years.

### **Parental Warmth and Monitoring**

There is a broad research literature base relating parenting styles, which usually entail a parental warmth component, to school success (Beyer, 1995; Dornbusch & Ritter, 1990; Lam, 1997; Steinberg, Elmen, & Mounts, 1989; Steinberg, Lamborn, Dornbusch, & Darling, 1992). Steinberg and his colleagues (1989, 1992) tested the hypothesis that authoritative parenting is conducive to academic achievement. They discovered that all three components of authoritative parenting (warmth/acceptance, parental control, and psychological autonomy) contributed positively to adolescent academic achievement. Using a sample of adolescents from various ethnic backgrounds, Steinberg, Dornbusch, and Brown (1992) found that adolescents with parents who are warm, firm, and democratic achieve greater success in school. In studies of both White and Black adolescents, effort did not correlate with better grades for those youth who came from homes with authoritarian parenting styles (Dornbusch & Ritter, 1990; Wentzel, 1994). In addition, father warmth has been found to be positively related to school-aged children's perceived academic achievement (Wagner & Phillips, 1992) and maternal warmth has been positively associated with children's motivation and subsequent academic achievement (Beyer, 1995).

Findings also suggest that parental monitoring of behaviour can influence educational outcomes. Young adolescents who report medium or high parental monitoring of behaviour achieve significantly higher GPA scores than those who report low parental monitoring (Lam, 1997). Using NELS:88 data, Muller (1993) found that adolescents who spend more time at

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home alone after school have significantly lower test scores and slightly lower grades. Crouter, MacDermid, McHale, and Perry-Jenkins (1990) reported gender differences in the effects of monitoring and concluded that parental monitoring may be particularly important to boys' school achievement. Clearly, family processes have been found to play an important role in influencing students' academic achievement.

**Family Cohesion**

The variable of family cohesion describes the way all family members interact with each other and the type of atmosphere that characterizes the family as a unit or group. Studies on family cohesion within the homes of adolescents are limited. Available research reveals the importance of family support and nurturance for individual academic achievement (Floyd, 1997; Martini, 1995; Masselam, Marcus, & Stunkard, 1990). In a small sample of high-achieving Black adolescents, academic success was attributed to a supportive, nurturing family and home environment (Floyd, 1997). Masselam et al. (1990) concluded that dysfunctional families are perhaps less able to provide adolescents with family cohesiveness, stability, and emotional support, which may result in school failure. Among rural African American youth, family cohesion was found to indirectly influence academic achievement through self-regulation (Brody, Stoneman, & Flor, 1995). These findings offer support for the association between family cohesion and school achievement.

**Parental expectations**

Parents' individual characteristics are influential to how the family normally functions and affect how parents interact with their children regarding school-related issues (Ryan & Adams, 1995). For example, parental expectations for their children's education is a widely

studied area of research. Numerous investigators have found that parents who hold high educational expectations tend to have high-achieving children (Brookhart, 1998; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; for a review of the literature see Seginer, 1983). This finding has been replicated using a variety of age groups and races, but few studies have dealt with the mediating mechanisms which facilitate (or hinder) the effect of parents' educational expectations on grades (Seginer, 1983). We are unaware of a study that has examined parental expectations for their adolescent's education in the context of within-the-family processes.

### **Parent education and Student Race**

According to the Family-School Relationships Model, social-cultural constructs are considered to be 'outside the family' variables, which constitute the social, cultural, and economic context for the family (Ryan & Adams, 1995). The SES variable of parents' level of education has been associated with achievement in past research investigations (Brookhart, 1998; Muller & Kerbow, 1993). For example, Brookhart (1998) found that parents' education level have a significant impact on adolescent achievement, especially on science grades. Parents' formal education is an important resource by which parents convey knowledge to their child (Muller & Kerbow, 1993). Parents may also serve as role models, teaching their children the value of education through stories of their own education and schooling (Scott-Jones, 1995). However, researchers have observed that the association between parent education and child achievement is largely mediated through family process variables (Muller & Kerbow, 1993). Taken individually, SES is not a sufficient predictor of school achievement (Reynolds & Lee, 1991). Additional research is warranted to explore how SES may be mediated by other variables to affect adolescent academic achievement.

With respect to race, differences in academic achievement are often reported between White and Black populations (Jencks & Phillips, 1998). In general, it has been found that Black students “generally earn lower grades, drop out more often, and attain less education than do Whites” (Mickelson, 1990, p.44). This difference in academic achievement has been ascribed to numerous factors including SES, socialization practices, cultural values, environmental disadvantages, and social discrimination (Flynn, 1999; Jencks & Phillips, 1998; Steinberg et. al, 1992). Bankston III and Caldas (1997) found that there is a substantial gap between the test scores of White and Black students, which exists even when various indicators such as students’ involvement in school, family socioeconomic level, family structure, and school racial composition, are controlled. Differences in the family processes and individual member characteristics of White and Black families warrants more detailed examination. Further research is also warranted examining large samples of youth from varying ethnic, racial and family educational backgrounds.

### **Research Questions**

Data from the National Longitudinal Survey of Adolescent Health (Add Health) (Udry, 1998) will be analyzed to answer the following general research questions:

- 1) What are the significant linkages among family process variables, parent and adolescent individual characteristics, and academic achievement outcomes for youth in secondary school?
- 2) Are there different family processes and individual characteristics that impact academic achievement for White versus Black adolescents?

## Methods

### Sample

The nationally representative sample consists of U.S. secondary school students from the first wave of Add Health collected between September, 1994 and December, 1995 (Udry, 1998). There were three data sets available for public use: The in-school questionnaire, the in-home adolescent interview, and the in-home parent questionnaire.

The in-school measure was a self-administered questionnaire completed by the students within a 45 to 60 minute class period. Parents were informed before the questionnaire was administered so that they could refuse their child's participation if they so desired (Udry, 1998). The adolescent in-home interview time ranged from one to two hours, depending on the respondent's age. For purposes of confidentiality, no paper questionnaires were used. Rather, all information was recorded on lap-top computers. The parent in-home questionnaire was not as detailed as the adolescent in-home interview. The respondent, typically the mother, was asked to complete an interviewer-assisted, op-scanned questionnaire covering a range of topics related to his/her adolescent child (Udry, 1998).

The complete public-use version of the Add Health data contained 6,504 cases. After listwise deletion of the subjects due to missing data the final sample was 2321 respondents. The sample was comprised of 75.6% White adolescents, 17.1% Black adolescents, and 7.3% other race adolescents. There were 46.8% male respondents and 52.8% female respondents. The self-administered in-school questionnaire data was obtained from students in grades 7 through 12. The grade level distribution of the students was as follows: 7<sup>th</sup> grade - 13.9%; 8<sup>th</sup> grade - 15%; 9<sup>th</sup> grade- 18.7%; 10<sup>th</sup> grade - 19%; 11<sup>th</sup> grade - 18.2%; and 12<sup>th</sup> grade - 14.3%.

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Among the Black families, there was an intentional over-sample (38.3%) of well-educated parents (holding a college degree or higher). Otherwise, the parent education distribution among the entire sample was: 10.9% of parents had less than high school education; 29.8% had high school education; 29.0% had some post-high school education; 16.7% were college graduates; and 13.6% were post-college graduates. Married parents comprised the majority of the sample at 92.9%, while there were 3.4% divorced status and 3.7% other status parents. Total household income among the sample was apportioned as follows: \$0 to \$20,000 - 11.7%; \$20,000 to \$40,000 - 28.2%; \$40,000 to \$60,000 - 30.1%; and greater than \$60,000 - \$30%. The respondents who participated in the investigation represent a wide range of social classes due to the clustered sampling design of the study.

**Procedures**

Due to the number of variables examined in the present investigation, linear structural equation modeling (SEM) was used for the data analyses (Jöreskog & Sörbom). It is advisable to use this technique in data sets with large sample sizes and multiple variables that interact in a highly dynamic manner. The use of SEM is supported because of its capacity to simultaneously examine a large number of direct and indirect associations between variables (Jöreskog & Sörbom, 1989).

SEM allows for correlational data to be used to determine if a theoretical model fits observed data (Fassinger, 1987). As mentioned earlier, the guiding theoretical scheme used in the present analyses was the Family-School Relationships Model (Ryan & Adams, 1995). This model is structured along a proximal-distal dimension “with the intensity of interaction normally

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greatest between adjacent levels” (Ryan & Adams, 1995, p.7). In accordance with the model, exogenous social-cultural variables included parent education and student race, followed by parental characteristics, family process variables, parent-child school-focused interactions, adolescent characteristics, and lastly, the outcome variable of academic achievement. Variables were entered into the equation according to the level prescribed by the Family-School Relationships Model.

To begin, we determined the maximum likelihood estimates for each predictive relation in a just-identified model. The model was then trimmed using standard procedures by disregarding all pathways with coefficient values that failed to attain statistical significance at a (one-tailed) level of  $p = .01$ . Strict criteria was used in eliminating pathways because of the very large sample size used in this investigation. Even though very small beta values can be statistically significant, the aim of this present study was to identify only the sound and meaningful relationships between constructs using the theoretical foundations of the Family-School Relationships Model.

## **Measures**

Academic achievement. Achievement in school was measured using the adolescents' self-reported grades from the in-school questionnaire. Grades (A, B, C, D or lower, I don't know, or I didn't take this subject) were obtained from the following four subject areas: English/Language Arts, Mathematics, History/Social Studies, and Science. A mean was computed from all the grades that each student provided because many respondents answered with "I don't know" or "I didn't take this subject." Students had to provide a grade level for at least two subject areas in order to be included in the sample.

Self esteem. This construct was operationalized using a 6-item subscale selected from the in-school questionnaire. It included the items: "I have a lot of good qualities"; "I have a lot to be proud of"; "I like myself just the way I am"; "I feel I am doing everything just right"; "I feel socially accepted"; and "I feel loved and wanted." Students responded using a 5 point scale (strongly agree = 1 to strongly disagree = 5), which was reverse scored.

Intellectual ability. The PPVT is an individually administered measure of receptive vocabulary designed to provide an index of achievement and/or scholastic aptitude (Salvia & Ysseldyke, 1991). The Add Health Picture Vocabulary Test (AHPVT), which is a 78-item, computerized, abridged version of the Peabody Picture Vocabulary Test (PPVT) (Udry, 1998), was used in the present investigation. Raw scores were standardized by age and correlated strongly with the original PPVT-revised. The PPVT-revised has been successfully evaluated to have respectable internal consistency (.61 to .88) and test-retest reliability (.73 to .91) (Salvia & Ysseldyke, 1991; Wiig, 1985). Comparability to alternate forms also appears to be well established

(Wiig, 1985). The PPVT-revised has been shown to have content, construct, and concurrent validity (Wiig, 1985). The PPVT-revised is both a reliable and valid measurement tool.

Academic effort. The amount of effort that students applied to school work was assessed using the in-school questionnaire item, "In general, how hard do you try to do your school work well?" Respondents answered the question using the following 4 point scale: I try to do my best = 1; I try hard enough, but not as hard as I could = 2; I don't try very hard = 3; and I never try at all = 4, which was reverse scored.

Student aspirations. From the adolescent in-home interview, student educational aspirations were obtained from a 2-item sub-scale. The questions read: "On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want to go to college?"; and "On a scale of 1 to 5, where 1 is low and 5 is high, how likely is it that you will go to college."

Problem solving skill. A 4-item sub-scale from the adolescent in-home interview was used to measure the youths' problem solving skill. The questions read as follows: "When you have a problem to solve, one of the first things you do is get as many facts about the problem as possible"; "When you are attempting to find a solution to a problem, you usually try to think of as many different ways to approach the problem as possible"; "When making decisions, you generally use a systematic method for judging and comparing alternatives"; and "After carrying out a solution, you usually try to analyze what went right and what went wrong." The students answered the questions using a 5 point reverse scored scale (strongly agree = 1 to strongly disagree = 5).

Talking about school. There were two questions selected for the parent-child school-focused interventions level. In the in-home interview, adolescents were asked whether they

discussed "school work or grades" and "other things they were doing at school" with each of their parents in the past four weeks. Response categories were "yes" or "no".

Parental warmth. Three items dealing with parental warmth were taken from the adolescent in-home interview. The youth were asked to answer the following two questions using a 5 point scale (strongly agree = 1 to strongly disagree = 5): "Most of the time, your mother is warm and loving toward you"; and "Most of the time, your father is warm and loving toward you". The third question read, "How much do you feel that your parents care about you?" and was answered with the following 6 point scale (not at all = 1; very little = 2; somewhat = 3; quite a bit = 4; very much = 5; and does not apply = 6). All scales were reverse scored.

Parental monitoring. The constructs of mother at home and father at home were assessed in the in-home adolescent interview with the question, "How often is your [mother/father] at home when you return from school?" The questions were answered using a reverse scored 6 point scale (always = 1; most of the time = 2; some of the time = 3; almost never = 4; never = 5; and she brings me home from school = 6).

Family cohesion. This construct was operationally defined by a 3-item sub-scale which included the following adolescent in-home interview questions: "How much do you feel that people in your family understand you?"; "How much do you feel that you and your family have fun together?"; and "How much do you feel your family pays attention to you?" Students responded on a 5 point scale (not at all = 1 to very much = 5).

Parental expectations. Parental expectations were examined from the adolescent's point of view and were measured using a 4-item sub-scale from the in-home interview. It included the

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items: "How disappointed would your [mother/father] be if you did not graduate from high school?"; and "How disappointed would your [mother/father] be if you did not graduate from college?" The questions were answered on a scale of 1 to 5, where 1 was low and 5 was high.

Parent education. This SES variable was measured in the in-home parent questionnaire using the highest education level attained by the responding parent, who was typically the mother. Response categories included: 8<sup>th</sup> grade or less = 1; more than 8<sup>th</sup> grade, but did not graduate from high school = 2; went to a business, trade, or vocational school instead of high school = 3; high school graduate = 4; completed a G.E.D. = 5; went to a business, trade, or vocational school after high school = 6; went to college, but did not graduate = 7; graduated from a college or university = 8; professional training beyond a 4-year college degree = 9; never went to school = 10 (10 was re-coded to 0).

Student race. The exogenous variable of student race was determined based on the interviewer's observations. The interviewer was asked to "Mark the race of the respondent from [his/her] own observation alone." The response categories were as follows: White = 1; Black/African American = 2; American Indian/Native American = 3; and Asian or Pacific Islander = 4.

## Results

Cronbach alphas were computed for all measures to determine internal reliability. The alpha and the descriptive statistics of the mean and standard deviation for each variable are listed in Table 1. Several variables do not have a reported alpha value because single items were used to measure the construct. All variables fall within an acceptable range of  $\alpha = 0.57$  to  $0.90$ . The mean alpha for all measures is  $\alpha = 0.79$ . In general, internal consistency estimates were judged adequate.

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Insert Table 1 about here

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The correlations among the variables are presented in Table 2. Significant correlations were observed in the modest to moderate range of  $r = .11$  to  $r = .56$ . Student race was negatively correlated with intellectual ability. Moderate to high correlations were found among parent education, parental expectations, student aspirations, intellectual ability, and grades. Parent education was also negatively correlated with mother presence at home. Moderate to high correlations were observed between family cohesion, parental warmth, talking about school, self esteem, academic effort, student aspirations, and problem solving skill. Among the individual characteristics of academic effort, student aspirations, intellectual ability, and grades, relatively high correlations were discovered.

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Insert Table 2 about here

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During the just-identified model, testing the following variables were eliminated due to the nonsignificant association. These trimmed variables included: problem-solving skill, talking about school, and father at home. Only the final, over-identified model with corresponding beta coefficients is reported in this study. The chi-square test value for the over-identified model was significant ( $\chi^2 = 187.27$ ;  $P = 0.0$ ). Adequate values were obtained for the goodness of fit index ( $GFI = .985$ ) and the adjusted goodness of fit index ( $AGFI = .971$ ), which are ratios of the sums of squares accounted for by the model to the total sums of squares of the estimated population matrix (Fassinger, 1987).

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Insert Figure 1 about here

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The final just-identified model reveals a multitude of direct and indirect effects on self-reported grades earned. We shall describe the findings with the variables most adjacent to grades, branching into the various levels of family processes until we arrive at the two indicators of SES. We shall also discuss a unique process that predicts self-esteem, but not academic achievement.

Of the four individual characteristics of the adolescents, three predicted grades earned with almost equal weighting. That is, intellectually ability ( $\beta = .21$ ), student aspirations ( $\beta = .22$ ) and academic effort ( $\beta = .25$ ), but not self-esteem, predicted grades earned. These three sets of academic characteristics of children are often identified as predictors of academic achievement, but are seldom included in the same analysis. Two additional modest direct effects were observed. Parent education ( $\beta = .10$ ) and student race ( $\beta = -.13$ ) predicted grades earned. That is, higher parent education and Black households predicted higher and lower

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grades, respectively. In total, 25 percent of the variance in grades earned is accounted for by five variables with direct effects on academic achievement.

A multitude of linkages were observed between family processes and individual characteristics that predict academic achievement. Family cohesion is associated with students engaging in higher efforts ( $\beta = .20$ ), which predicts grades earned. Student aspirations that predict academic achievement are predicted by family cohesion ( $\beta = .14$ ) and parental expectations ( $\beta = .27$ ), with higher parent education predicting higher parental expectations ( $\beta = .17$ ). Further, parent education ( $\beta = .31$ ) and student race ( $\beta = -.27$ ) predict adolescents' intellectual ability which, in turn, predicts grades earned. Higher parent education also predicts more mothers at home ( $\beta = .14$ ), but mother presence at home did not predict individual characteristics of the adolescent or grades earned.

Finally, while self-esteem did not predict academic achievement, this positive emotional state was predicted directly by family cohesion ( $\beta = .26$ ) and indirectly from family cohesion to parental warmth ( $\beta = .56$ ) and from parental warmth to self-esteem ( $\beta = .14$ ).

## Discussion

The pattern of findings of this study reveal multiple linkages between family processes, parent and adolescent individual characteristics, and academic achievement outcomes. As predicted by the Family-School Relationships Model (Ryan & Adams, 1995), each level of the model was found to have a mediating indirect effect on adolescent characteristics with the noted exception of the general parent-child interaction variables of parental warmth and mother presence at home. Hence, distal factors were primarily mediated by the more proximal factors of adolescent individual characteristics. These patterns of findings suggest that the Family-School Relationships Model (Ryan & Adams, 1995) provides a useful template for investigating the family-school link.

The first objective of this study was to examine the individual and family interactions as they relate to adolescent achievement. The findings suggest that qualities intrinsic to the adolescent make robust contributions to academic outcomes. Intellectual ability, academic effort, and student aspirations were all found to be strongly related to adolescent grades. However, in contrast to a large body of research literature (Manscill & Rollins, 1990; Morvitz & Motta, 1992; Muijus, 1997) and the finding of a modest but statistically significant correlation ( $r = .16$ ) between grades and self esteem in this study, self esteem was not associated with adolescent grades in the multivariate context of the structural equations examined. Despite the widespread belief of a self esteem and achievement relationship, the findings of this study imply that a causal association between self esteem and grades may be insupportable (similarly suggested by Ryan et al., 1995). If true, an intervention approach which seeks to enhance school achievement through direct self esteem counseling will not be an effective solution to the

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problem of academic failure. According to the findings of this study, focusing intervention efforts on a combination of intrinsic characteristics of the adolescent, namely, intellectual ability, academic effort, and student aspirations, would be a more effective means for enhancing academic success.

The constructs of mother presence at home and parental warmth were also found to be unrelated to the academic achievement outcome. The monitoring variable of mother presence at home was found to be associated with parent level of education, but unexpectedly did not affect adolescent academic achievement. This result is in direct opposition with previous findings which have suggested that adolescents who spend more time at home alone after school have significantly lower test scores and slightly lower grades (Muller, 1993). The finding suggests that perhaps mother presence at home after school is not a sufficient measure of monitoring. Or perhaps monitoring does not have the same effect on adolescents as it does on younger children. Adolescence has been characterized as a time when youth struggle for greater independence and autonomy from their parents (Silverberg & Gondoli, 1996). This normal separation process from parents may account for the fact that no relationship emerged between parental monitoring and adolescent achievement. The finding also implies that the previously ascribed detriment of mothers' labour force participation and absence from the home for achievement outcomes (Muller, 1993), may be in question.

The variable of parental warmth was directly related to self esteem, but did not emerge as a predictor of academic achievement in the multivariate analyses. Previous findings have linked parental warmth with school-aged children's academic achievement (Beyer, 1995; Wagner & Philips, 1992). However, findings of the current analysis reveal that during adolescence, the

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salience of parental warmth for achievement may disappear. An authoritative parenting style encompassing a parental warmth component has also been associated with academic success (Steinberg et al., 1989; Steinberg et al., 1992). The absence of a relationship between the authoritative parental warmth component and school achievement in the present study may be attributed to the fact that this investigation only partially examined the components of an authoritative parenting style. If other parts of the parenting style were examined, such as parental control and psychological autonomy, the results may have supported an association between parental warmth and academic performance.

An under-studied research area examined in the present investigation was that of the general family environment. A few studies have revealed a connection between family support and nurturance, and individual academic achievement (Floyd, 1997; Martini, 1995; Masselam et al., 1990). However, none of these researchers examined general family climate in the context of adolescents' individual characteristics. Our findings reveal that family cohesion does in fact affect grades, but the effects are mediated through students' academic effort and educational aspirations. It appears that the relationship between family cohesion and student grades is an indirect influence that is mediated by the adolescents' personal characteristics. This finding proposes that adolescent's educational aspirations and effort applied to school work may depend on a supportive and cohesive family climate.

There was a direct relationship found between parent and adolescent individual characteristics, as evidenced by the association between parental expectations and student educational aspirations. Numerous investigations have found that parents who hold high educational expectations tend to have high-achieving children, although few of these studies

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accounted for the mediating family factors involved in the relationship (Bandura et al., 1996; Brookhart, 1998; Seginer, 1984). In the present investigation indirect relationships were examined and it is clear from the findings that the parental expectations-to-grades relationship is strongly mediated through children's own aspirations for school success. Obviously parents play an important part in influencing their children's personal aspirations and decisions about schooling endeavors even into the adolescent years.

The exogenous social-cultural variable of parent education has been associated with children's school grades in numerous past research investigations (Brookhart, 1998; Muller & Kerbow, 1993; Scott-Jones, 1995). Muller and Kerbow (1993) reported that the association between parent education and child achievement is largely mediated through family process variables. In opposition to these findings, our study revealed that it is not family processes, but rather adolescents' individual characteristics, namely intellectual ability and student aspirations, that mediate this relationship. The results indicate that parents may in fact serve as role models, influencing their adolescent child's aspirations for academic success.

A direct association was also discovered between parent education and student grades. This direct relationship may be explained by the fact that intellectual capacity reflected by parents' past achievements in school often plays a large role in the child's achievement outcomes (Broucker & Lavallée, 1998). In addition, the parents' education level is a social-cultural variable that is considered 'outside the family' (Ryan & Adams, 1995). This suggests that parents' level of education places youth in a particular social-cultural context which affects their achievement outcomes. For instance, children of parents who have attained a high level of education are likely to reside in a surrounding neighbourhood and community where there is

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potential for contact with other children and adults from well-educated families. Living in this environment and interacting with achievement-oriented individuals could conceivably result in high-performing adolescents who have a strong desire for success in school. High parent education may therefore place adolescents in a social-cultural context for more enriched learning themselves.

The second goal of this investigation was to examine whether there were different family processes or individual characteristics that affect academic achievement for White versus Black adolescents. Results from this investigation indicate that being of Black descent is directly related to lower achievement outcomes. This finding is particularly interesting due to the special over-sample of well-educated (holding a college degree or higher) Black parents in the study. The result may suggest that despite coming from well-educated backgrounds, Black adolescents are still at social-cultural risk when it comes to achievement outcomes. This direct relationship may also reflect the wide range of social classes used in this study's sample, as a larger variance results in more direct effects among the constructs under investigation. Other studies of African American youth have revealed that a nurturing family and home environment can translate into academic success (Floyd, 1996). These results were not supported in the present analysis, as family processes played no role in the race-to-achievement relationship.

Black adolescents are also more likely to obtain lower vocabulary scores as measured by the AHPVT, which indirectly translates into lower grades. This finding suggests that interventions to augment academic outcomes among Black adolescents should emphasize improving the language and vocabulary skills of these at-risk youth. Knowledge of Standard English may be vital if a person is to progress academically, socially, and economically (Salvia

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& Ysseldyke, 1991). However, vocabulary test results must always be examined with caution and explored within a cultural context. For instance, a number of studies of Black English have shown that it has its own rules for pronunciation, structure and meaning and that these and other culturally determined alternative language constructions are not incorrect or inferior (Salvia & Ysseldyke, 1991). Rather, they are appropriate for this youth's surrounding community (Salvia & Ysseldyke, 1991).

This investigation offers preliminary findings into the factors related to academic achievement in adolescence. Further research is needed to enhance the results with a sample that is separated into age groups of early, middle, and late adolescence, and which examines gender differences. As with any study that uses a large pre-existing data set, some of the items available were not the best indicators for the constructs under investigation. Further, in some instances, only one or two items from the data set were available to represent a given construct, which may have affected the reliability of the scales used. Despite these shortcomings, this study offers some significant findings for improving academic success among high school students.

### **Conclusion**

Researchers have advised that the most successful interventions are those that are focused on family relationships and/or circumstances external to the family (Cowan, Powell, & Cowan, 1998; Martini, 1995; Wentzel, 1994). Indeed, as evidenced by the present study, strengthening family cohesion has merit for improving adolescent academic outcomes. However, individual characteristics of the adolescent were found most predictive of academic success along with exogenous variables and parent individual characteristics playing a significant role in the achievement process. It is therefore likely that the most powerful achievement-enhancing interventions would in fact involve coordinated efforts representing various levels. Policy-makers should accordingly focus approaches for academic success at both the individual and family planes to maximize the educational performance of adolescents.

**Table 1**  
Mean, Standard Deviation, and Alpha Coefficient for each Variable

	Mean	Std. Dev.	Alpha
Parent education	5.90	2.26	-
Student Race	1.41	.90	-
Parental Expectations	4.40	.80	.80
Family Cohesion	3.81	.78	.79
Parental Warmth	4.49	.53	.57
Mother at Home	3.24	1.40	-
Father at Home	2.52	1.39	-
Talking About School	.55	.38	.79
Self Esteem	3.89	.73	.84
Intellectual Ability	104.64	12.74	-
Academic Effort	3.29	.65	-
Student Aspirations	4.47	.88	.82
Problem Solving Skill	3.78	.61	.82
Grades	2.94	.75	.90

Table 2  
Correlation Matrix of all Variables used in Path Analysis

	Par Edu	Race	Par Exp	Cohes	Warmth	M. Home	F. Home	School	Esteem	Effort	Stu Asp	Prob-Sol	Int Ability	Grades
Par Edu	1.000													
Race	-.014	1.000												
Par Exp	.173**	.004	1.000											
Cohes	.041	-.069**	.073**	1.000										
Warmth	.060**	-.073**	.072**	.563	1.000									
M. Home	-.153**	.009	-.036	.072**	.043*	1.000								
F. Home	-.038	.054**	-.041	.074**	.043*	.158**	1.000							
School	.064**	.030	.093**	.141**	.150**	.030	.036	1.000						
Esteem	.076**	.024	.065**	.352**	.306**	.021	.037	.068**	1.000					
Effort	-.008	.078**	.015	.186**	.135**	.056**	.013	.048*	.249**	1.000				
Stu Asp	.277**	.023	.327**	.163**	.140**	-.099**	-.012	.107**	.165**	.170**	1.000			
Prob-Sol	.006	.057**	.059**	.218**	.141**	.039	.073	.039	.192**	.139**	.082**	1.000		
Int Ability	.297**	-.168**	.122**	-.036	.044*	-.071**	-.086**	.058**	-.009	-.053*	.189**	-.066**	1.000	
Grades	.215**	-.011	.140**	.096**	.086**	-.005	-.033	.067**	.155**	.259**	.334**	.019	.297**	1.000

\*\*p<0.01, \*p<0.05 (2-tailed)

Note: Par Edu = Parent education; Race = Student Race; Par Exp = Parental expectations; Cohes = Family Cohesion; Warmth = Parental Warmth; M. Home = Mother at Home; F. Home = Father at Home; School = Talking about School; Esteem = Self Esteem; Effort = Academic Effort; Stu Asp = Student Aspirations; Prob-Sol = Problem Solving Skill; Int Ability = Intellectual Ability; Grades = Grades.

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