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A Mediation Analysis

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Ann Kathleen Burlew
PhD M & L

**FAMILY INVOLVEMENT, PERSONAL COMPETENCE,
& ACADEMIC ACHIEVEMENT: A MEDIATIONAL ANALYSIS**

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by

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Family Involvement, Personal Competence, Academic Achievement: A mediational model

Abstract of a Master's Thesis

Submitted by Kyna D. Griffith

Since 1990, the high school dropout rate among Blacks has hovered around 13.1% (National Center of Educational Statistics, 2001). Achieving a high quality education has always been recognized as a crucial part of improving one's social and economic prospects (U.S. Department of Education, 1995).

Research has shown a relationship between the parent-child bond (including communication) and students' academic achievement (Desimone, 1999; Sui-Chu & Willms, 1996). A supportive family environment with parenting behaviors such as approval, praise, help, encouragement, physical affection, and expression of terms of endearment is positively related to academic achievement in adolescence (Wenz-Gross, Siperstein, Untch, Widaman, 1997).

In this study, personal competence refers to self-perceptions, such as, self-efficacy, self esteem, and self-concept. Low self-efficacy is among the many variables frequently identified as having a relationship with minority underachievement (Isaacs & Duffus, 1995). Self-beliefs of competence and confidence prove influential in producing positive change (Lev, 2000). Children's self-perceptions can influence their academic achievement as early as preschool (Justice, Lindsey, & Morrow, 1999).

Parents are critical to fostering self-esteem and mastery motivation in their children (Van Aker & Wehby, 2000). Research has shown a relationship between the amount of support one receives from family members and one's self-esteem. This suggests that families play a crucial role in the development of self-worth (McCreary, Slavin, & Berry, 1996). Bradley and Corwyn (2001) suggest that efficacious cognitions mediate the relationship between the home environment and the child's academic performance and/or prosocial behavior. In the present study, personal competence has been proposed as a mediator of the relationship between family involvement and adolescents' academic achievement.

The theories that lend support to the hypothesized model include the interactionist perspective of families (Lamanna & Riedmann, 2000) and Bandura's social learning and self-efficacy theory (Bandura, 1986). The interactionist perspective, as well as, the social learning theory reinforces the important role that the family plays in the development of children's identity and self-perceptions. The self-efficacy theory (Bandura, 1986) maintains that self-perceptions are derived from social (family) interaction and influence one's performance.

The present study seeks to analyze the relationships between family involvement (i.e. supervision, communication, and bonding), personal competence, and academic achievement (i.e. G.P.A.) in a sample of African American adolescents. A family involvement factor has been included in this study as a predictor of academic achievement. In the research model, personal competence is proposed as a mediator between family involvement and academic achievement. It is proposed that increased family involvement will improve children's assessments of themselves and in turn enhance their academic achievement.

Hypotheses and Proposed Model

The mediational model will be tested on 6th grade adolescents. As specified by Baron and Kenny (1986), the following relationships are predicted:

1. As family involvement increases, children's personal competence increases significantly.
2. As personal competence increases, children's academic achievement significantly increases.
3. As family involvement increases, academic achievement significantly increases.
4. The relationship between family involvement and academic achievement will decrease when the mediational effects of personal competence are controlled.

Method

Participants

This is a secondary analysis using a sample comprised of African American adolescents who participated in a local and national cross-site study of high-risk youth. The present study utilized 240 of the participants who belonged to the control group or otherwise did not participate in the program. The participants were sixth grade males and females, with a mean age of 11.5 years.

Instruments

The National Youth Survey (NYS) used six items from the Individual Protection Factor Index (Springer & Phillips, 1986) to measure family bonding. In the present study four of the original six items were used to assess family bonding (two were removed because they lowered the reliability of the overall scale). In the NYS, the Family Relationship Scale (Cernkovich & Giordano, 1987) was used to measure communication and supervision: three items measured communication and three items measured supervision. The communication and supervision

scales were kept intact in the present study. The NYS included twelve items from the Individual Protection Factor Index (Springer & Phillips, 1986) and two items from the Self-efficacy Scale (Sherer & Maddux, 1982). In this study, these fourteen items were used to measure personal competence. School records (GPA and attendance) were obtained to assess the participants' academic achievement in the seventh grade. Information regarding demographic information was obtained using items from the National Youth Survey.

Procedure

Announcements and flyers were used to recruit participants from several sixth grade classes of low-income elementary schools. Those whose parents signed consent forms completed the instruments in a group setting. A school record form was developed to collect school data. The items from the survey were read to the participants in a group setting and a small monetary gift was given to the students for taking the time to fill out the forms.

Results

The analysis was performed in several steps. First, preliminary data analyses were conducted. This involved computing descriptive statistics for all variables, examining the distribution of each variable, and possibly transforming skewed variables. Structural equation modeling was used to test the proposed model. First, Confirmatory Factor Analysis (CFA) was conducted to examine whether the measured variables loaded on the factor family involvement. Then, the overall model was tested. Fit indices were consulted to determine the degree to which the model explained the data.

In the CFA, the family involvement factor was just identified due to having exactly three indicators; thus, the regression weights, instead of the chi-square statistic, were examined and determined adequate. The overall model was then tested and the results were indicative of a good fit as shown by a nonsignificant Chi-square ($N=240$, $p=0.164$) and adequate fit indices values ($RMSEA=.047$, $NFI=0.996$). Results showed that family involvement had a significant positive relationship with adolescents' personal competence (associated critical ratio greater than 1.96); thus, hypothesis one was substantiated. However, hypotheses 2, 3, and 4 were not supported. The findings illuminate the important role that family plays in the development of children's self-perceptions and thoughts regarding their abilities.

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DEDICATION

To Mom and Dad.

You both have been my parent and my teacher.
Thank you for your loving support and constant prayers.

To my grandparents,
who always had great dreams for their grandchildren
and encouraged us to reach for the sky:
Beyond our limits and up to God.

The heights that great men reached and kept were not attained by sudden flight;
but they while their companions slept were toiling upward in the night.

Dedicated to Sylvia Weekes (1917-1998)

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Disparity in academic performance among student subgroups (e.g. race/ethnicity, gender, parental education level, etc.) has been the crux of many educational reform efforts that have developed over the last 30 years (NAEP, 1999). Gaps in academic achievement among today's youth have prompted research that focuses on the elements needed for academic success (Gutman, L., Sameroff, A., Eccles, J., 2002; Okagaki, 2001; Rowe, D., & Cleveland, H., 1996). Despite progress in reducing Black-White gaps in mathematics and reading achievement, Blacks have continued to score lower than Whites in the NAEP (National Assessment of Educational Progress) (Snyder, Hoffman, and Geddes, 1997). In a study assessing the academic achievement of poor African American adolescents, the high achieving students had parents who were more involved in their education within the home (e.g., conversing with their adolescents regarding school and monitoring their activities) as well as at school (e.g., staying in contact with the teachers) (Gutman & Midgley, 2000). Parental involvement in the lives and education of their children is considered an essential element of school reform (Desimone, 1999).

Children's self-assessments are positively related to their academic motivation (Justice, Lindsey, & Morrow, 1999). Pajares (1996) found that self-beliefs play a critical role in academic success. Similarly, a study conducted on 148 African American high school sophomores showed that high achievers had higher scores than low achievers, on a self-concept test (Haynes & Hamilton-Lee, 1987).

Bradley and Caldwell (1995) found that an adolescent's environment stimulates and encourages (or discourages) specific behaviors that are reciprocally influenced by intrapersonal factors such as self-efficacy. Thus, a parent who provides a supportive home environment fosters a high level of self-efficacy in their adolescent and, in turn, may influence the

adolescent's behavior through increased motivation intensity and persistence in pursuit of a desired goal (Bradly & Corwyn, 2001).

Results from previous research have revealed various relationships between individual (e.g., self-perception), family (e.g., bonding), and academic achievement variables (Marchant, Paulson, & Rothlisberg, 2001; Kobal & Musek, 2001; Okagaki, 2001; Sanders, 2001; Herbert, 2000; Zimmerman, 2000; Halle & Kurtz-Costes, 1997; Feldman & Wentzel, 1990). The present study seeks to analyze the relationships between family involvement (i.e. supervision, communication, and bonding), personal competence (i.e. self-concept, self-control, self-efficacy and positive outlook), and academic achievement (i.e. G.P.A. and attendance) in a sample of African-American adolescents. In the research model, personal competence is proposed as a mediator between family bonding and academic achievement. It is proposed that increased family bonding will improve children's assessments of themselves and, in turn, enhance their academic achievement.

Academic Achievement

Achieving a high quality education has always been recognized as a crucial part of improving one's social and economic prospects (U.S. Department of Education, 1995). Nelson Mandela repeatedly emphasized the importance of education, especially to the Black community, which is struggling to shed the remnants of racial segregation (Dyer, 2000). According to Price (2001), since education is the surest route to the middle class, academic achievement must be the priority of African Americans in the 21st century (Price, 2001).

In 1997, approximately 87% of African American young people attained their high school diplomas as compared to 55% in 1970. Between 1976 and 1997, the number of Black women and men enrolled in college increased by 68% and 21% respectively (Price, 2001).

Individuals who obtain a college degree are still at a greater advantage than those who do not in terms of earnings (Hecker, 1998) and employment rates (Bureau of Labor Statistics, 1999).

Thus, understanding the factors related to increased academic expectations and academic achievement among adolescents should be of great interest to educators (Sanders, 2001).

Despite these improvements, between group gaps still exist in students' academic achievement. Since 2000, the high school dropout rate among Blacks has hovered around 13.1% as opposed to 6.9% for white counterparts (National Center for Educational Statistics, 2000). In a study, conducted by the National Center for Education Statistics, assessing disparity in educational achievement noted that Black-White gaps in mathematics and reading achievement appeared at every grade studied (Jacobson, J., Olsen, C., Rice, K., Sweetland, S., & Ralph, J., 2001).

The middle school years (grades 6-8) may be an ideal time to examine academic achievement because students in these years are often characterized by the emergence of factors related to achievement such as, increased feelings of depression, adjustment problems, e.g., low self-concept, and decreased motivation for school (Eccles, J., Midgley, C., Wigfield, A., Buchanan, C., Reuman, D., Flanagan, C. & Mac Iver, D., 1993). Hence, the academic achievement of middle school African-American adolescents is the focus of this present study; the findings of which will contribute to the current literature on this cohort.

Family Involvement

Previous research has revealed that a number of family factors may influence the child's feelings of competence and achievement. These include family processes (Dishion, Patterson, Stoolmiller, & Skinner, 1991), family support (Unger, McLeod, Brown, & Tressell, 2000),

family bonding and cohesiveness, as well as the degree to which family members feel close and spend time together (Smith, Prinz, Dumas & Laughlin, 2001).

In 1989, Dornbusch and Wood suggested that family processes are more important than family status. They argue that we limit the majority of children when we focus on family status such as family structure, parent educational level, ethnicity, and socioeconomic status; because this assumes incorrectly that acquired and unchangeable intellectual advantages and disadvantages fall within lines drawn by class, ethnicity, and household structure. They suggest that more research is needed to identify specific family processes, such as parenting styles, interactions with family members, parental discipline and parental involvement in education, that produce differences in educational achievement.

More recent research has uncovered the strong, positive relationship between the parent-child bond (including communication) and students' academic achievement (Desimone, 1999; Sui-Chu & Willms, 1996; Muller, 1995). Research has consistently supported the idea that families that communicate about problems with their children in an effort to resolve them, yield children with better problem-solving abilities (Coughlin & Vuchinich, 1996). Some researchers have found a significant effect of home environment on cognitively related test scores (Carlson & Corcoran, 2001; Baharudin, Rozumah, Luster, 1998; Brooks-Gunn & Klebanov, 1996; Crane, 1996).

A study by Gray & Steinberg (1999) revealed that all three dimensions of authoritative parenting (acceptance-involvement, autonomy granting, and behavioral control) were significantly and positively related to academic competence and each variable was exclusively predictive of this outcome. Paulson, Marchant, & Rothlisberg (1998) found that adolescents who perceived authoritative parenting also perceived a positive school atmosphere. Authoritative

parenting has been shown to contribute to a positive self-concept in adolescents (McClun & Merrell, 1998). Most researchers agree on the significant role of authoritative parenting styles and active parental involvement in maximizing children's academic success across grades, gender, and ethnic groups (Steinberg, 2000).

Christenson, Rounds, & Gorney (1992) found in their review of the literature on family factors and student achievement that there is a relationship between academic achievement in adolescents and the quality of relationship with parents. However, this relationship has not always been consistent. Parental involvement was one of the objectives of National Educational Goals 2000 in order to promote the social, emotional and academic growth of children (Sanders, 2001). A supportive family environment with parenting behaviors such as approval, praise, help, encouragement, physical affection, and expression of terms of endearment have been positively related to academic achievement in adolescence (Wenz-Gross, Siperstein, Untch, Widaman, 1997).

Family organizational structure has also been found to be related to children's externalizing behavior and to moderate the indirect relationship between interparental conflict and children's academic achievement. Family organization, such as providing clear rules and guidelines for children's behavior, is influential in promoting positive behavior and achievement (Unger, McLeod, Brown, & Tressell, 2000).

Coley and Hoffman (1996) pointed out that supervision and contextual variables (i.e. household composition, marital status, poverty, type of neighborhood, etc) together have been found to be significantly related to academic achievement. They found that lack of supervision and monitoring were related to low academic achievement in single-parent households. Others have found that adolescents in safer neighborhoods benefited better from parenting practices that

employ loose supervision and promote autonomy but not those who lived in dangerous neighborhoods (McCarthy, Lord, & Eccles, 1993 as cited in Coley & Hoffman, 1996).

Family supervision, communication, and bonding comprise the family involvement factor that has been included in this study as a predictor of academic achievement. These three variables (supervision, communication, and bonding) have been found vital to parenting and are some of the main components that comprise the foundation of Diana Baumrind's model of parenting styles (Baumrind, 1999). These variables are examined in this study in an effort to understand the type of family interaction that the participants experience. For the present purpose, supervision refers to the extent to which parents know where their children are and who they are with. Communication is defined as parent-child conversations that take place regarding issues that are important and crucial to the child. Bonding encompasses a general view of the family-child interaction.

Personal Competence

Personal competence has been previously defined in the literature as an amalgamation of personal efficacy and decision making (Epstein, Griffin, and Botvin, 2000). Bandura formally defined perceived self-efficacy as personal judgments of one's capabilities to organize and execute courses of action to attain designated goals (Bandura, 1977, 1997). Beliefs of being competent and confident have proven influential in producing positive change (Lev, 2000).

In the present study, personal competence refers to self-perceptions such as, self-concept, self-control, self-efficacy, and positive outlook. Increased positive outlook has been related to happier feelings toward life and less depressive symptoms in adolescents (Lau & Lau, 1996). Personal competence has positively influenced psychological wellness and have decreased negative outcomes, such as alcohol related behaviors (Epstein, Griffin, and Botvin, 2002).

Both theory and research have shown that self-efficacy beliefs play an important role in the prediction of performance and goal attainment (Sue-Chan & Ong, 2002; Ballantine & Nunns, 1998; Bandura & Cervone, 1986). Four mechanisms explaining the relationship between self-efficacy and performance were proposed by Earley and Lituchy in 1991:

- Efficacious individuals put more effort and are more persistent in their pursuit of their goals than individuals with low self-efficacy.
- Self-efficacy is positively related to the attention that individuals pay their environment.
- As compared to inefficacious individuals, individuals high in self-efficacy are more likely to have an internal locus of control and are thus likely to increase their subsequent efforts following a set back.
- Perceptions of performance (whether over or underestimated) abilities influence performance.

During the past two decades, self-efficacy has emerged as a highly effective predictor of students' motivation and learning (Zimmerman, 2000). Studies have supported the assertion that self-efficacy is a significant predictor of future performance, i.e., the higher the self-efficacy the higher the level of task performance (Ballantine & Nunns, 1998; Earley & Lituchy, 1991; Bandura, 1982). Self-concept and self-efficacy are among the many variables frequently identified as having a relationship with minority under-education and underachievement (Isaacs & Duffus, 1995.) There has been evidence (Bandura, 1997) that self-efficacious students participate more readily, work harder, persist longer, and have fewer adverse emotional reactions when they encounter difficulties than do those who doubt their capabilities. Self-efficacy beliefs have been found to be sensitive to subtle changes in students' performance context, to interact

with self-regulated learning processes; and to mediate students' academic achievement (Zimmerman, 2000).

Family Involvement and Personal Competence

The findings from a study of 128 adolescents revealed that the quality of parent-child relationship is an important predictor of adolescent outcomes (Hay, 2000). Adolescents' perceptions of their family environments have a strong relationship with their self-concept (Raw & Marjoribanks, 1991). Research has shown a relationship between the amount of support one receives from family members and one's self-perceptions (Roberts, Seidman, Pedersen, Chesir-Teran, Allen, Aber, Duran, & Hsueh, 2000; Nielsen & Metha 1994; Felson & Zielinski, 1989; Gecas & Schwalbe, 1986). This suggests that families play a crucial role in the development of children's thoughts and feelings regarding themselves and their abilities (McCreary, Slavin, & Berry, 1996). Findings have shown that highly democratic parenting was significantly related to high levels of self-concept. Parents have a profound impact on the development of the general self in adolescents (Bowles & Fallon, 1996).

Parents are able to foster self-esteem and mastery motivation in their children (Van Aker & Wehby, 2000). In a study conducted on African American families, families that were cohesive and communicative were also more organized and had a sense of purpose that promoted the development of child competencies (Smith, Prinz, Dumas, & Laughlin, 2001). Coley & Hoffman (1996) found that children in dangerous, at risk neighborhoods who experienced low supervision and monitoring exemplified lower self-efficacy than those children in less risky neighborhoods.

Having someone who is respected by an individual and who believes that the individual can achieve a desired behavior contributes to that individual's confidence (Lev, 2000). In

keeping with this line of thinking, it is conceivable that a favorable family environment initiates a chain of events that leads to personal competence and, ultimately, to academic achievement.

Personal Competence and Academic Achievement

Unless people believe they can produce desired outcomes by their actions, they have little incentive to act or to persevere in the face of difficulties (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). Prussia, Anderson, and Manz (1998) found that self-efficacy perceptions fully mediated the relationship between employee self-leadership and performance. In addition, adolescents' self-concept has been shown to mediate the relationship between maternal child rearing and involvement with peers (Dekovic & Meeus, 1997). Bradley and Corwyn (2001) suggest that efficacious cognitions mediate the relationship between the home environment and the child's academic performance and/or prosocial behavior. The inconsistency in the presence of a direct relationship between family factors and achievement noted in the literature (Christenson, Rounds, and Gorney, 1992) may be due to overlooking the role variables such as self-efficacy and self-control. In the present study personal competence, of which self-efficacy and self-control are a part, is proposed as a mediator of the relationship between family involvement and children's academic achievement.

Prescott Lecky (1945) was among the first to point out that students' level of achievement could be related to self-perceptions (Hamacheck, 1995). Since that time, much research has been done in this area. Studies have highlighted the utility of positive self-efficacy in fostering academic success (Lane & Lane, 2001; Hoeltje, Zubrick, Silburn, & Garton, 1996; Wentzel, 1991, as cited in Scheier & Botvin, 1998). General self-efficacy has been associated with fewer mental health problems and higher academic achievement suggesting that youths' perception of their abilities is a valid indicator of their actual level of emotional, interpersonal,

and academic functioning (Hoeltje, Zubrick, Silburn, & Garton, 1996). Research findings support the presence of a relationship between self-concept and achievement (Hay, Ashman, and Van Kraayenoord, 1998a). Low self-concept has been found to be an indicator of school difficulties and behavior problems (Hay, Ashman, and Van Kraayenoord, 1998b). Children's self-perceptions can influence their academic achievement as early as preschool (Justice, Lindsey, & Morrow, 1999).

Research by Nakhaie, Silverman, & Lagrange (2000) showed lack of self-control to be significantly related to resistance to school. In their study of 2,495 adolescents, lack of self-control was the strongest predictor of students' resistance to school. Research has affirmed the positive relationship between global self-esteem and academic achievement (Baker, Beer, & Beer, 1991; Smith, Sapp, Farrell, & Johnson, 1998). It has also been found that students' motivation and self-beliefs are significant predictors of science and mathematics achievement (House, 2001). In a study by Wiest, Wong, & Kreil (1998) children with high-perceived competence earned better grades than did those who had less positive views of themselves.

Theoretical Underpinnings

Among the theories that lend support to the hypothesized model are Diana Baumrind's model of parenting styles, the interactionist perspective of families, which is based on the early work of Charles Cooley and George Mead, and Bandura's Social Learning and self-efficacy theory. Diana Baumrind (1991) proposed three modes of family interaction or parenting styles: authoritarian, permissive and authoritative. In the authoritarian style of parenting, parents attempt to shape control, and evaluate the behavior and attitudes of their children in accordance with an absolute set of standards. A verbal give-and-take parent-child interaction is discouraged. The authoritarian parent is high in demandedness and low in responsiveness. The permissive

parenting style is characterized by parents who are tolerant and accepting toward the child's impulses and who enforce fewer demands or punishment. Lastly, the authoritative parents expect more mature behavior from the child, firmly enforce rules and standards implementing punishment when needed, encourage the child's independence and open communication that embraces verbal give-and-take (as cited in Lam, 1997).

Dornbusch and his colleagues (1987) tested Baumrind's theory in a large diverse adolescent sample. They found that authoritarian and permissive parenting styles were associated negatively with grades while, authoritative parenting was positively associated with better grades. In general, nurturant, consistent, and authoritative parenting styles are positively related to children's cognitive competence and confidence regarding their abilities and achievement; whereas critical, inconsistent, and authoritarian styles are related to less advanced cognitive development (Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987).

Internal family dynamics and the belief that individuals develop concepts of self and identity through social interaction (e.g., interaction with family members) lie at the heart of the interactionist perspective (Lamanna & Riedmann, 2000). Among others, Charles Cooley and George Mead proposed that the self is a social product and that we learn to see ourselves as (we perceive) others see us (Gecas & Schwalbe, 1986). Initially, popularized by Cooley's discussion of the "looking-glass self", this idea has also been expressed in terms of "reflected appraisals" (Rosenberg, 1979 as cited in Gecas & Schwalbe, 1986). Parental support may positively impact one's self-esteem because of the process of reflected appraisal (Cooley, 1902 and Mead, 1934 as cited in Felson & Zielinski, 1989). In the family, we would expect the reflected appraisals of parents to be particularly significant for children's self-conceptions (Gecas & Schwalbe, 1986).

This theory supports the hypothesized relationship between family involvement and personal competence. As suggested by the interactionist perspective, it is proposed that positive interactions with parents and family help to shape a positive identity and self-perceptions of the child.

Social learning theory (SLT) as proposed by Albert Bandura emphasizes interactions among humans as the major source of information about the physical world and ourselves (Lev, 2000). The social learning theory also supports the notion that children's self-perceptions are derived from their interaction with those around them, primarily their family.

A key element in social learning theory is the concept of self-efficacy (Marakas & Yi, 1998). Self-efficacy refers to a person's belief regarding whether he or she has the ability to accomplish a given task. Self-efficacy is developed through experiences in one's social environment, progressing from the family to one's peers (Bandura, 1997). Bandura (1977) used the term self-efficacy to describe a person's confidence in performing certain behaviors in certain situations. Ultimately it is the cognitive appraisal and integration of the information that determines self-efficacy (Bandura 1982). Bandura (1986) concluded that when precise measurements of efficacy are made, a high correspondence between efficacy and performance is found (Harrison, Rainer, Hochwarter, & Thompson, 1997). This theory undergirds the hypothesis that self-efficacy is positively related to academic achievement (performance). Many prevention strategies have relied on self-efficacy and social cognitive theory in an effort to mitigate a wide range of problem behaviors (Scheier & Botvin, 1998). When self-efficacy theory is viewed in conjunction with social learning theory and the interactionist perspective, a case is made for the mediating effects of self-efficacy. The aforementioned theories support the notion that self-efficacy and positive self-perceptions (personal competence) are derived from

family/social interactions, which in turn positively impact one's achievement. Together these theories serve as the underpinnings for the proposed model of the present study.

Hypotheses of the present study

In the present study, personal competence is proposed as a mediator between family involvement and academic achievement. More specifically, the following four relationships are predicted:

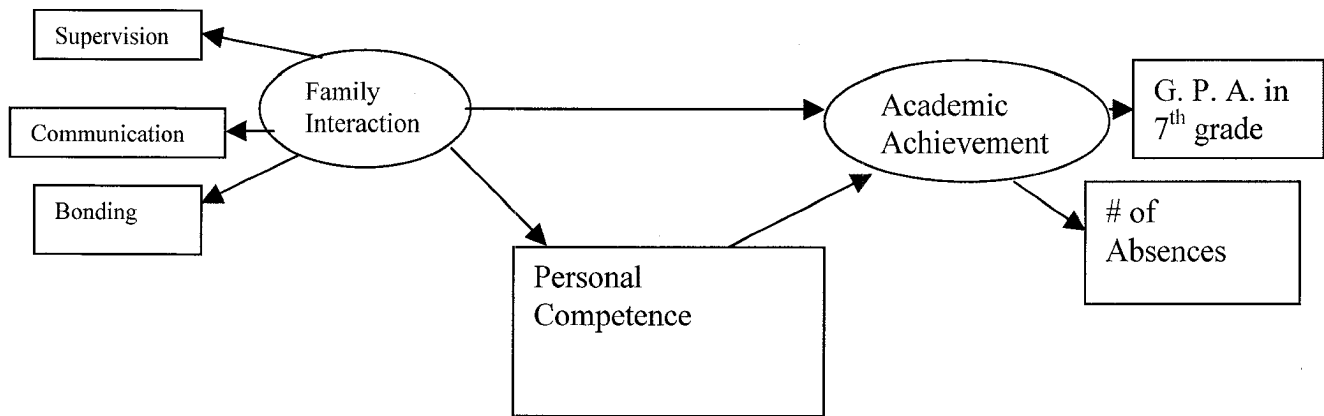
- As family involvement increases, children's personal competence increases significantly.
- As personal competence increases, academic achievement significantly increases.
- As family involvement increases, academic achievement significantly increases.
- Finally, the relationship between family involvement and academic achievement will weaken when the mediational effects of personal competence are controlled.

The proposed mediational model will be tested on adolescents at the seventh grade level. The following model shows the factors, their indicator variables, and the hypothesized relationships.

Proposed Model

The general conceptual model presented summarizes the major components of family involvement in relation to adolescent academic achievement. It is inherent in the presentation of this model that parents influence children's behavior rather than vice versa. It is recognized that relations among these variables may be explained by "third variables" not included in the model.

Figure 1: Proposed Model



METHOD

Population and Sample

The population included African-American, adolescent sixth graders attending middle school. This is a secondary analysis of data obtained from a local and national cross-site study of high-risk youth. The Center for Substance Abuse and Prevention (CSAP) funded the original study. Due to the variables involved in the present study, a sample size of two hundred forty was used. All participants were placed in either a treatment or comparison (control) group. Those in the treatment group participated in activities that fostered togetherness and self-confidence. For this study, only those in the comparison and low dosage groups (less than half of the treatment) were used. The participants included both males and females, with a mean age of 11.5 years, who attended various elementary schools in Cincinnati, Ohio. 57.8 % of the sample was comprised of females and males made up the other 42.2 %. The schools were located in a low income, African American community adjacent to a large Midwestern city.

Procedure

Announcements and flyers were used to recruit participants from several sixth grade classes of low-income elementary schools. Interested students and their parents were invited to a social event at which they obtained more information regarding the project. After consent was received, participants completed the survey in a group setting. In the larger study, participants were randomly assigned to an intervention or comparison group. The data were collected during the first session of enrollment when the adolescents were in the sixth grade and follow-up data were collected when the adolescents were in the seventh and eighth grades. Demographic information was obtained from the National Youth Survey. Data for this study were obtained at baseline before the participants were separated into the treatment or comparison group. The

GPA and absence data are the only exceptions because they were collected, through school records, at the seventh grade level from the comparison and low dosage (less than half of the treatment) group.

Instruments

The overall battery included a number of measures already available in the literature but combined to form the National Youth Study (NYS). Family involvement, personal competence, and academic achievement were assessed using the following measures.

The family involvement factor is comprised of three variables: bonding, supervision, and communication. Various items from the Individual Protective Factor Index (IPFI) (Springer & Phillips, 1986) and the Family Relationships Scale (Cernkovich & Giordano, 1987) were used to assess all three variables. Four items from the IPFI comprise the family bonding scale, three items from the Control and Supervision factor of the Family Relationships Scale made up the supervision scale, and three items from the Instrumental Communication factor of the Family Relationships Scale composed the communication scale. All items inquired about parent-child interactions and were answered from the child's perspective. An example of an item from each group follows:

- Bonding - "I like to do things with my family."
- Supervision – "My parents want me to tell them where I am if I don't come home right after school."
- Communication – "How often do you talk with your parents about your plans for the future?"

All three variables were distributed univariate normal and two yielded a moderate reliability: bonding (.63) and communication (.63). Supervision had a lower reliability of .56; however, it was improved to .61 by using standard scores instead of raw scores.

Items from the Individual Protective Factor Index (IPFI) (Springer & Phillips, 1992) and the Self-Efficacy Scale (Sherer et al., 1982) were used in the National Youth Survey. Springer and Phillips (1992) identified self-concept, self-control, self-efficacy, and positive outlook as being indicators of personal competence. The personal competence scale in the present study was comprised of fourteen items: (Out of the IPFI) three items from the self-concept subscale, 3 items from the self-control subscale, 3 items from the self-efficacy subscale, and 3 items from the positive outlook subscale were used in addition to two items from the Self-efficacy Scale. This scale met the assumption of normality and had an associated reliability of .56. An example of one of the items is, "If I can't do a job the first time I keep trying until I can."

In this study, academic achievement was determined by grade point average and attendance. While all the data from the aforementioned predictor instruments were obtained during the 6th grade, the academic achievement data (dependent variable) were obtained during the 7th grade. Thus, this study is examining the relationship of family involvement and perceptions of personal competence that were present in the sixth grade to academic achievement in the 7th grade. Grade point average was recorded on a four-point (4.0) scale. Attendance was ascertained from the number of times a student was absent from school. Both sets of data were obtained from school records.

Analysis of the Data

The analysis was performed in several steps. Preliminary data analyses were performed to understand the nature of each variable on both the item and scale level. This includes

conducting exploratory factor analysis, confirmatory factor analysis, and reliabilities to ascertain the set of items that best measures the desired variable. Reliabilities were improved by conducting exploratory factor analysis and removing items that did not contribute to the essence of the variable. In some cases (i.e., family supervision), standard scores were also used for this purpose. Four of the original six items were used to comprise the family bonding scale. The communication, supervision, and personal competence scales were left intact. Descriptive statistics and frequencies were obtained on the scale level, skewness and kurtosis levels were checked, and necessary transformations were made. Skewness and kurtosis for most variables fell within acceptable limits (Tabachnick & Fidell, 1997). The kurtosis value associated with family supervision fell outside the acceptable bounds of 4 and -4 but this was corrected with a square root transformation. Likewise, a logarithm transformation was conducted on the “absent” variable to bring it within acceptable bounds of skewness and kurtosis.

Structural equation modeling (SEM) was used to test the model. The statistical package used was AMOS. According to SEM guidelines, the primary analyses took place in two steps (Anderson & Gerbing, 1988). First, the measurement model was tested through confirmatory factor analysis. Second, the structural model was tested. The chi-square statistic and goodness of fit indices, such as, NFI (normed fit index), RMSEA (root mean square error of approximation), and AIC (Akaike information criterion) were examined to determine the degree to which the proposed model explained the hypothesized relationships. Regression weights and associated critical ratio values were inspected to ascertain the presence of significant relationships between variables. The existence of a mediator variable was also tested.

Results

Description of Sample

All participants were African-American adolescents between the ages of 10 and 13. The mean grade point average in the seventh grade was 1.95, “C average.” Eleven percent of the sample had a 3.0 GPA or higher while 50 % of the sample had GPAs of 2.0 or lower. The GPAs ranged from 0.50 to 3.7. More than half of the sample (52.1%) had been absent from class at least 10 times during the 7th grade year. The mean number of absences was 13.69. Table 1 delineates the means and standard deviations of all observed variables in the model, as well as, sample characteristics.

Table 1

Descriptives for observed variables and Sample characteristics

<u>Variables</u>	<u>mean</u>	<u>std. dev.</u>
Family Bonding	13.66	2.31
Family Communication	7.49	3.24
Family Supervision	3.80	1.42
Personal Competence	48.90	3.97
GPA	1.96	.81
Absences	13.70	12.24

Preliminary Analyses

Preliminary analyses were conducted on the data including visual inspection of variables, check for outliers, necessary transformations to correct for extreme skewness or kurtosis, and an inspection of the data to verify univariate normality. An outlier, due to data entry error, was identified and removed from the “absent” variable. Guidelines reported by Tabachnick and Fidell (1996), between -2 to 2 for skewness and -4 to 4 for kurtosis were used to determine whether the distributions were acceptable. To correct for unacceptable values of skewness and kurtosis, a square root transformation was performed on the “supervision” variable and a

logarithm transformation was performed on the “absent” variable. In addition, reliabilities for each scale were assessed on the item level. Reliabilities were improved by removing items that did not contribute to the overall essence of the scale and at times by using standard scores instead of raw scores, as was done in the case of the “supervision” variable. (For a detailed summary of reliabilities, see Method section.)

The Hypothesized Model

The hypothesized model that was presented earlier in Figure 1 depicted the hypotheses in graphic form. The circle represents the latent variable Family Involvement, which is the independent variable. The measured variables family bonding, communication, supervision, personal competence, grade point average, and number of absences appear as rectangles. The arrow between two variables indicates that a relationship was proposed; thus, the absence of an arrow suggests that no relationship was proposed.

Primary Analyses

The proposed model was tested in two steps utilizing Structural Equation Modeling techniques (Anderson & Gerbing, 1988). First the measurement model and then the structural model were assessed. Analyses were conducted with AMOS software.

Step one involved confirmatory factor analyses (CFA), which determines if the data support the proposed relationship between each latent variable and its associated indicator variables. CFA was used to assess the relationship between Family Involvement and its three observed indicators: family bonding, communication, and supervision. Due to the fact that the Family Involvement factor had exactly three indicators, the measurement model was just identified. A chi-square of 0.000 was obtained, as expected, in this situation because the chi-

square and the other fit indices are not meaningful in a just identified model. Therefore, the regression weights were the primary means of determining whether the indicator and latent variables had been matched appropriately. Table 2 summarizes the findings of the Family Involvement CFA. The regression weights for the links between family involvement and two of the indicator variables (bonding and communication) were adequate. However, the link between the family involvement latent variable and supervision was barely adequate. Accordingly, two other models were tested. Supervision was removed completely from one model. In the second model, supervision was included as a separate indicator not associated with the family involvement factor. Neither alternative improved the fit. Thus, it was decided to keep supervision as an indicator of family involvement as originally proposed. Figure 2 shows the CFA regression weights.

GPA and number of absences were originally proposed as indicators of an Academic Achievement factor. However, due to the fact that this factor only had two indicators, the model was underidentified, meaning that the model did not contain sufficient information for parameter estimation. Ultimately, it was decided to use GPA and absence as separate dependent variables instead of indicators of a latent factor. (See Figure 3, for modified model.)

The second step was to test the structural model. The overall results indicated good model fit. The independence model, an alternate model that tests the null hypothesis that no relationships exist among the variables, was rejected on the basis of a significant Chi-square, ($N=240$, $p=0.000$). The rejection of the independence model is desirable in SEM because it suggests that some relationships are present among the variables. The Chi-square for the proposed model was nonsignificant ($N=240$, $p=0.164$). Nevertheless, other fit indices were calculated and examined for evidence of fit because the chi-square statistic is influenced by

sample size. The values for NFI (Normed Fit Index) and CFI (Comparative Fit Index) (0.996, 0.999) indicate good fit because they are greater than 0.95. The RMSEA (Root Mean Square Error of Approximation) value of .047 denotes good fit (a value less than .05 represents good fit) (Byrne, 2001). Finally, the values for AIC (Akaike Information Criterion) and BCC (Browne-Cudeck Criterion), (51.18 and 52.44 respectively) indicate good fit because they are smaller than the same values given for both the independence model and the saturated model. Table 2 summarizes the results from this test of the structural model.

Although, the chi-square statistic and fit indices showed adequate fit, critical ratios were consulted to determine the significance of specific paths in the model. The links from Family Involvement to family bonding, communication, supervision, and personal competence were all significant (associated critical ratios were either greater than or less than 1.96, meaning that the standardized regression weights were all significant at the .05 level). However, the links from family involvement to GPA and number of absences were not significant; neither were the links from personal competence to GPA and absence. Figure 3 shows standardized regression weights.

Personal competence was originally proposed as a mediator to the relationship between family involvement and academic achievement. The structural model was tested for mediation, according to customary guidelines (Baron and Kenny, 1986; Holmbeck, 1997). This was an additional test apart from the test of the structural model; however, no evidence of mediation was found. This was due to the fact the first step in establishing mediation was not present: a significant relationship was not found between family involvement and either the GPA or the absent variable (see Figure 4). The Sobel test (Preacher & Leonardelli, 2001), which checks for mediation, was also conducted and the associated probability values were not significant,

indicating no mediation. Thus, only one of the proposed hypotheses was substantiated, a significant positive relationship was found between family involvement and personal competence. The other hypotheses were not supported.

Table 2

Fit Statistics for CFA and Full Model

Model	df	χ^2	NFI	CFI	RMSEA
CFA*	0	0.00	--	--	--
Full Model	6	9.176	0.996	0.999	0.047

Note. NFI=normed fit index; CFI=comparative fit index; RMSEA=root mean square error of approximation.

*CFA (confirmatory factor analysis) model is equal to saturated model and is just identified.

Figure 2: Family Involvement CFA

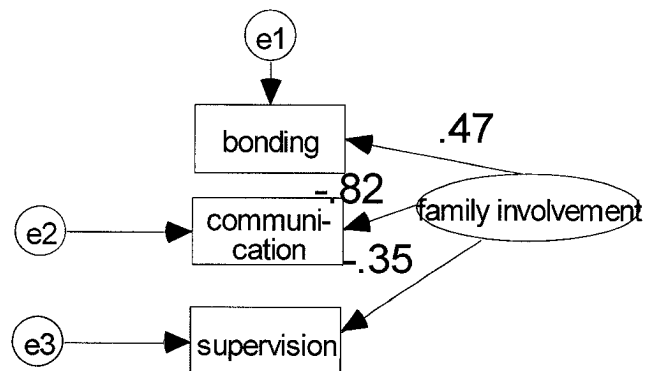


Figure 3: Structural Model

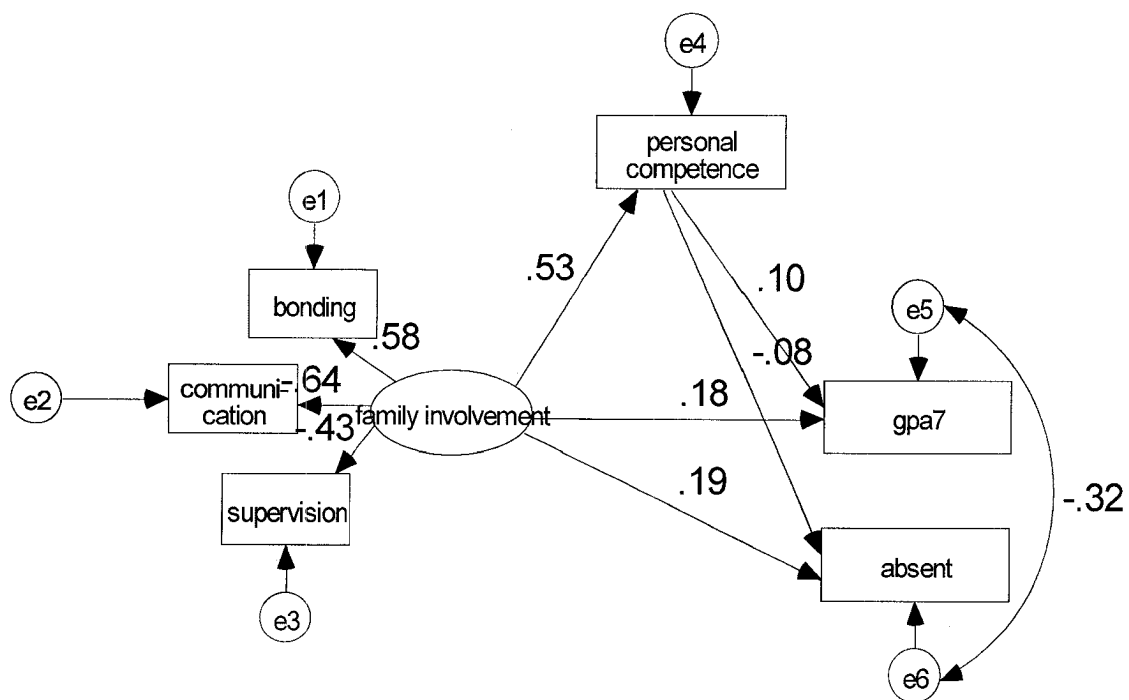
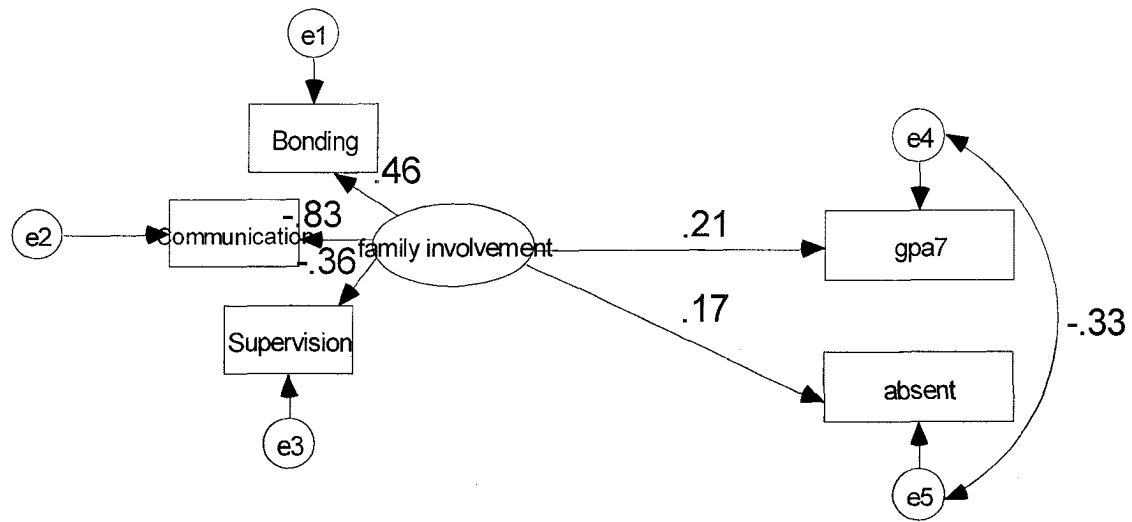


Figure 4: First Step in Mediation Test



Discussion

The aim of the present study was to examine more closely the relationship between family factors, personal competence, and academic achievement. The proposed model depicted personal competence as a mediator between the family factor and the indicators for academic achievement. Specifically, the following hypotheses were made.

- There would be a significant, direct, positive relationship between family involvement and academic achievement variables, GPA and number of absences.
- As family involvement increased, children's personal competence would increase significantly.
- As children's personal competence increased, their academic achievement would also increase, evident by higher GPAs and lower number of absences.
- Lastly, the direct relationship between family involvement and academic achievement variables would decrease when the effects of personal competence was taken into account.

Using structural equation modeling, the proposed model was found to adequately fit the data. The model was substantiated by the chi-square statistic and goodness of fit indices.

Critical ratios were examined to see if any of the hypothesized significant relationships existed.

This examination revealed that only one of the hypotheses was supported. As expected, family involvement was found to have a significant positive relationship with children's personal competence. A significant relationship between family involvement and academic achievement variables was not found. Neither was there a significant relationship between personal competence and academic achievement variables.

These findings both coincide with and diverge from previous literature. A significant positive relationship was found between family involvement (bonding, communication, supervision) and personal competence. This finding is consistent with the results that Coley and Hoffman (1996) obtained indicating that the degree of parental supervision was related to adolescents' self-efficacy. The present study also echoed the sentiments of previous research (McCreary, Slavin, & Berry, 1996) and the interactionist perspective of families which suggested that children's self-perceptions are shaped by their familial interactions (Lamanna & Riedmann, 2000). In the present study, family involvement did not have a significant relationship with academic achievement variables (GPA and absences). This was inconsistent with past research, such as that reported by Dishion, Patterson, Stoolmiller, & Skinner, 1991. In addition, personal competence was not significantly related to academic achievement nor did it fulfill the proposed role of mediator. This finding diverged from some past research that suggested such a relationship (Hoeltje, Zubrick, Silburn, & Garton, 1996; House, 2001; Wiest, Wong, & Kreil, 1998).

In light of these differences, it is important to note that the present study was longitudinal in nature. The majority of studies found in the literature were cross-sectional. Thus, the present study departed from the norm in that the effects of family involvement and personal competence were studied over a period of time, one year. The divergent findings may also be due to the presence of a third variable not included in the model.

Although only one of the proposed hypotheses was supported, the present study has many strengths and contributes to current research in the area of family, personal competence, and academic achievement. This study was conducted on a completely African-American sample. This is not the norm in the current literature and more research is needed in this area to

understand the specific needs of this population whose educational history has been fraught with challenges. The present study was longitudinal in that school data was obtained one year after the students' entrance into the study. Thus, the long-term effects of family involvement were assessed. Because GPAs were obtained from school records, academic achievement did not have to be approximated, the criterion was on hand and part of the main analyses.

The findings from this study join with the past literature and everyday experience in reaffirming the importance of family. Family involvement (i.e., bonding, supervision, and communication) does have a significant and profound impact on children's perceptions regarding their skills and capabilities. Through communication and moments of family bonding children can develop positive thoughts regarding their abilities. Interventions that focus on improving adolescents' feelings of personal competence should include activities that foster positive family interaction.

There are some limitations to the present study that might be addressed in future research. Low reliability may have contributed to the nonsignificant relationships between family involvement and academic achievement, as well as, personal competence and academic achievement. Also, in the present study only two indicators of academic achievement were used. More indicators, such as teacher's ratings of student performance or grades in extracurricular activities, may have given a more global representation of academics.

Conclusion

The present study examined the relationships between family involvement, children's personal competence, and their academic achievement. A secondary analysis was conducted on data collected from a sample of African-American adolescents. The findings showed a positive, significant relationship between family involvement (i.e. bonding, communication, and supervision) and personal competence. The present results reinforce the need for family interaction and the importance of having family time. Future research is needed to examine the effect that the family may have on different dimensions of children's academic achievement.

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