

Path Analysis of the Academic Achievement of Black Eighth Graders

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ABSTRACT. This study analyzed the academic achievement of a nationally representative sample of black eighth-graders ($N = 2730$) and their parents by examining the direct and indirect "effects" of family, personal and school variables on academic achievement. A literature review provided a theoretical basis by identifying nine explanatory variables that fit into three categories. Academic achievement was a composite of standardized test scores in reading, mathematics, science and social studies. Data were collected through the National Center for Educational Statistics Longitudinal Study (NELS:88). Path Analysis revealed that five of the nine explanatory variables were related to academic achievement. SES, motivation and ability demonstrated the largest direct effects on achievement. School variables demonstrated only negligible effects on achievement. Motivation and ability were the best mediators of family variables. The mediating effects of school variables were either negligible or absent. The reader is urged to use caution interpreting these results.

High achievement test scores, grade promotion, high grade point averages and graduation from high school have been cited as indicators of academic success (Bhaerman & Kopp, 1988; Office of Educational Research and Improvement, 1987; Tuck, 1989). Conversely, poor performance on achievement tests, low grade point averages, dropping out of school and similar outcomes are identified as indicators academic failure (Cummins; 1989; Martinez-Pons & Zimmerman, 1989; Ogbu, 1987; Trueba, 1988). These indicators of failure have been exhibited frequently by a large proportion of minority students (Cummins, 1989; McDill, 1985; Jaynes & Williams, 1989; Trueba, 1988).

Disproportionate school failure among minority students has been widely confirmed in the research literature as well as other publications. For example, McDill (1985) alludes to the large racial/ethnic differences in dropout rates. The National Center For Educational Statistics (NCES) (1991) reported that in 1991, approximately 3.9 million persons ages 16 through 24 (12.5%) had not completed high school and were not enrolled; additionally, approximately 6.8% of the 1988 eighth graders comprising the cohort being studied dropped out of school between eighth and tenth grade; Hispanics and blacks in the

1988 cohort dropped out at almost twice the rate of whites; and in 1991; the dropout rate for Whites, blacks and Hispanics in the 16 through 24 age group was 8.9, 13.6 and 35.3 respectively (NCES, 92-129).

These national dropout trends are comparable to those for the state of Florida. In addition to accounting for a higher proportion of the dropout figures than their white counterparts, minority students' dropout rates exceed their proportion of Florida's school population. In 1987-88 minorities constituted 35% of Florida's public school students and 37% of the state's dropouts (Florida Department of Education, 1989 & 1992). In 1991-92 minorities constituted 36% of public school students but 49% of Florida's dropouts (Florida Education Commissioner's Press Release, December 12, 1992).

Western Interstate Commission for Higher Education (WICHE) (1991) projected a 10% decline in white non-Latino student enrollment between 1986 and 1995, and a concomitant increase in minority enrollment of up to 50% among Hispanics in the US over the same period. According to WICHE (1991), the white non-Latino population increased by only 10% between 1980 and 1990, while the Asian population soared by 100%, and the Hispanic population grew by 53%.

Although blacks were the slowest growing minority during the decade of the 1980s, they remain the largest of the four major minority groups in the US. Blacks comprise 12% of the U.S. population, and their numbers grew by 12% between 1980 and 1990. Black public school enrollment has been predicted to increase by 13% during 1986 and 1995. However, their academic progress lags far behind that of their white counterparts. According to Tribble (1992), programs developed to ameliorate the factors that contribute to the shoddy academic performance of black students have failed, possibly because these efforts neglected to address the probable root causes.

Black high school graduates account for only a negligible percentage of enrollment in post secondary institutions. The number of black high school graduates has been predicted to decline by 6% between 1989 and 1995 (WICHE, 1991, p. 11). While blacks were approximately 15% of the 18 to 24 year old population in 1990, they comprised only 10% of the first time college freshmen in 1988.

The combination of projected accelerated population growth and the statistics regarding the low levels of academic progress among minority students and, more specifically, black students, suggests a negative impact on future individual and national prosperity. The report, "Quality Education for Minorities Project, 1990" points to the aging of the existing American labor force, and the likely shortage of professionals and highly skilled workers in the near future. Efforts to improve levels of academic attainment among black students require a clear understanding of the contributing factors. Certainly, this task requires more than the identifying variables that are related to academic achievement. According to Pascarella and Terenzini (1979), such analyses yield only a partial, oversimplified picture of what seems to be a highly complex set of dynamics.

This study used path analysis to examine direct and indirect effects of family, personal and school related variables on a composite measure of academic achievement of black eighth graders. The following research questions were addressed in this study:

- (1) To what extent is the academic achievement of black eighth-graders accounted for by personal (*motivation, ability, employment*), family (*family structure, SES, family educational values*), and school (*curriculum, study time, teacher quality*) variables?
- (2) To what extent is the influence of family variables on achievement independent of personal and school variables?
- (3) To what extent do school variables mediate the effect of personal variables on academic achievement?

A Theoretical Framework for Studying Academic Achievement

The theoretical framework of the model for this study is based on patterns of continuing research developed to investigate academic achievement. This study tested a fused model drawn primarily from models of academic achievement by Keith (1988), Duran & Weffer (1992), and Walberg (1986). The nine explanatory variables in the model proposed for this study have been reported as important influences on academic achievement and have appeared in earlier models of academic achievement. In addition, these variables have been associated with achievement in numerous non-explanatory studies.

The literature has reported that either positive or inverse relationships between *academic achievement* and *SES* (White, 1982; Witthuhn, 1984; Majoribanks, 1987; Prom-Jackson et al., 1987; Wilson & Allen, 1987; McCartin & Meyer, 1988; Reyes and Stanic, 1988; Eagle, 1989; Benbow et al., 1991; Hossler & Stage, 1992); *family structure* (Shaw, 1979; Bales, 1979; Wilson & Allen, 1987; Prom-Jackson et al., 1987; McCartin & Meyer, 1988; Eagle, 1989); *family educational values* (Fyans & Maehr, 1987; Eagle, 1989; Hossler & Stage, 1992; Duran & Weffer, 1992; Keith, 1992); *motivation* (Uguroglu and Walberg, 1979; Fyans and Maehr, 1987 & 1990); *ability* (Walberg, 1984; Jackson, 1986; Wilson & Allen, 1987; Chase & Jacobs, 1989; Kessler, 1989; Williamson et al., 1991; Hossler and Stage, 1992; Duran & Weffer, 1992); *part-time employment* (Barryman and Schreider, 1982; Meyer, 1987; Wirtz 1987; MacArthur, 1990; Steinberg et al., 1992; Steinberg 1992); *curriculum* (Walberg, 1984; Vanfossen et al. 1985; Wilson & Allen, 1987; Keith & Cool, 1988; Pelavin and Kane, 1990; Duran & Weffer, 1992); *study time or homework* (Rimm and Lowe, 1988; Duran and Weffer 1992); and *quality of instruction* (Benbow and Walberg, 1991; Fyans and Maehr, 1987 & 1990; Rosenthal and Jacobsen, 1976; Gilbert and Gay; 1985).

The Model

Figure 1 shows a theoretical model for this study. This model examines influences on academic achievement for black eighth graders in American public schools. The data to be analyzed in this study were collected during a single survey period; thus the causal sequencing of variables reflect theoretical and conceptual ordering of circumstances and experiences in the lives of the students in the study.

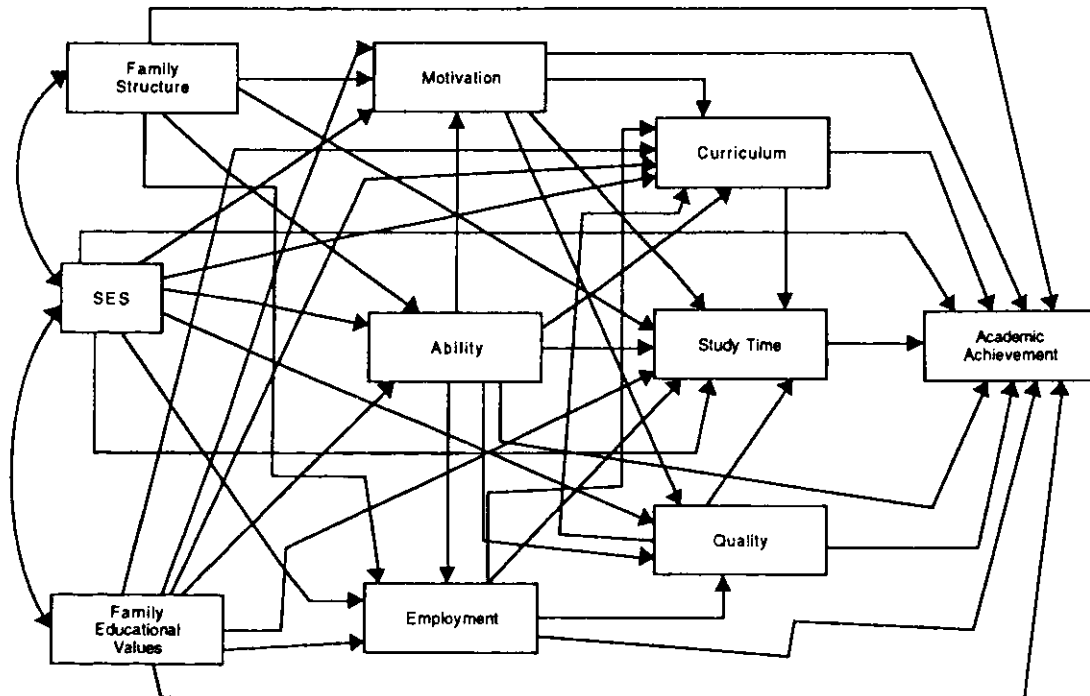


Figure 1. Conceptual path model of academic achievement for black eighth-graders.

Method

The subjects of interest in this study consisted of a nationally representative sample of ($N = 3171$) black eighth graders, extracted from the National Educational Longitudinal Study of 1988 (NELS:88) data base. In addition, parents of these students responded to a questionnaire from which items were included in the variable pool for this study. From the original NELS:88 subsample of 3171 black students, complete data for the purposes of this study were found for a total of 2730 subjects. These subjects were included for analysis.

Measures and Procedure

Instrumentation and data collection procedures are described in NCES NELS:88 Users' Manuals. The variables analyzed in the present study were extracted from the

NELS:88 student survey and eighth test battery, and the NELS:88 parent survey. Some variables were composites created by NCES researchers; others were created for the purposes of this study, while others were single-item variables. A listing of the variables analyzed in this study, their composition, and technical characteristics follow.

Definition of Terms

This study drew on earlier research by Keith (1988), Duran and Weffer (1992) and Hossler and Stage (1992), and others for the operational definition of the variables.

Academic achievement, the outcome variable, was defined as a composite of the number of items the student answered correctly in reading comprehension (21 items), mathematics (40 items), science (25 items) and social studies (30 items).

Ability was defined as students' average course grades in grades 6-8 in English, mathematics, science and social studies (Student questionnaire item 81). The values of the grades were: A = 90 to 100; B = 80 to 89; C = 70 to 79; D = 60 to 69; and below D (below 60). NELS:88 researchers recoded the response categories in student questionnaire item 81a - 81d to a five point scale: A = 4; B = 3; C = 2; D = 1; and below D = .5, then took the mean of all non-missing values of the four equally weighted course grades. The range for ability was 0.5 to 4.0.

Curriculum was defined as students' enrollment in advanced, enriched, or accelerated courses in English (language arts), mathematics, science, and social studies (Student Questionnaire items 66a - 66d). A dummy code of 1 was used for enrollment and 0 for non-enrollment. The variables were summed resulting in a possible range of 0 to 4.

Employment was defined as the number of weekly hours of part-time employment reported by students (Student Questionnaire item 53). The reported hours were used to produce a five point scale: none = 0; up to 4 hours = 1; 5 to 10 hours = 2; 11 to 20 hours = 3; 21 or more hours = 4. The values were reversed in the analysis to associate more hours with the higher rating.

SES was calculated from father's education, mother's education, father's occupation, mother's occupation, family income, and household belongings. SES scores ranged from -2.97 through 2.56.

Family structure was derived from parents' reports of their relationship to the student and their spouse's/partner's relationship to the student (Parent Questionnaire item 1a - 1 and 1a - 2). The response options ranged from 1 for biological mother, 2 for biological father, to 10 for other. A three point scale is derived in which no biological parent = 1, one biological parent = 2, and two biological parents = 3.

Family educational values were defined as parent responses to items regarding:

(a) *Academic talk*: the frequency with which parents discuss academic matters with their child (Parent Questionnaire items 66 - 69). The response options were: not at all = 1; rarely = 2; occasionally = 3; often = 4;

(b) *Parent expectation*: whether parents expected their child to pursue post secondary education (Parent Questionnaire item 83). The response options were yes = 1; and no = 2 (values were reversed in the analysis);

(c) *Plans to finance child's education*: specific financial plans in place for child's post-secondary education (Parent Questionnaire items 84A - G). If the plan was present-- yes = 1; no = 2 (values were reversed in the analysis); the possible individual score range was 1 to 7;

(d) *Attitude toward financing education*: parents attitude toward financing their child's post-secondary education (Parent Questionnaire item 85C - G - H - I - J). The response options were: true = 1; and false = 2 (values were reversed in the analysis).

Study time was defined as a score representing the number of hours per week spent doing assigned homework as reported by the respondent (Student Questionnaire item 79A - 79E). The responses were recoded so that: none = 0; less than 1 hour = .5; 1 hour = 1; 2 hours = 2; 3 hours = 3; 4 to 6 hours = 5; 7 to 9 hours = 8; 10 or more hours = 10.

Motivation was defined as a composite score derived from the sum of five related variables gathered through NELS:88 Student Questionnaire: (1) Students identify their career goal by selecting only one of 14 career categories (item 52, recoded for this study using Hollinshead's (1975) nine-factor occupational scale). (2) Students' reported educational goals (items 45 - 47 & 49). The response scales were recoded so that the highest levels of accomplishment received the highest score. (3) The total number of days the student was absent during the four weeks prior to the survey administration date, and the frequency with which the student cut classes (items 75 & 76). (4) The number of discipline codes reported by the student for one semester (item 55). There are six factors with the response options: never = 0; once or twice = 1; and more than twice = 2. (5) "Locus of Control 2": a composite factor derived from a scale that measures degree of external or internal locus of control (Student Questionnaire composite BYLOCUS2).

Teacher quality was defined as scores on a 4 point scale that measured the student's perception of the quality of the teaching staff at his/her school (Student Questionnaire item 59F, G, H, I, & J). The four point response scale ranged from "strongly agree" to "strongly disagree." The scores were directionally recoded so that: strongly agree = 4; agree = 3, disagree = 2, strongly disagree = 1.

Treatment of the Data

Data for this study were obtained from the NELS:88 student and parent files. Records from the student file were matched with the parent file. The student identification number common to both files was used as the matching variable. A total of 2730 cases with matching student identification numbers were found on both the student and parent files. These cases were retained in the work file for the purposes of this study.

Items with reversed scales (scales with lowest score for response with greatest value) were recoded, to reflect the appropriate values for responses. Items comprising motivation were based on different scales, thus each item was transformed to have a mean of zero and a standard deviation of one. These scores were then summed to produce scores on the "motivation" variable.

Several of the proposed indicators of the variable "family educational values" evidenced between 35% and 100% missing values. Consequently, these items were excluded and the variable "Family Educational Values" was composed of parent items regarding frequency with which parents discussed academic matters with their child, and parents' expectations about their child's post secondary education.

Reliability of Composite Variables

Four composite variables, teacher quality, family educational values, curriculum and motivation, were created from multiple items related to these variables. Estimates of internal reliability were computed for each of the four measures. Alpha coefficients were 0.73 for the five-item "quality" variable, 0.62 for the five-item "family values" variable, 0.84 for the four-item "curriculum" variable, and 0.72 for the 11-item "motivation" variable.

Assumptions

Data were examined for violation of regression assumptions. The majority of the assumptions were met, but some transformations were necessary. Table 1 presents the variable transformations undertaken to meet regression assumptions.

Analyses

To address the questions of interest in this study, recursive path analysis (Pedhazur, 1982) was computed for each of the students specified in the study. SPSSX Regression procedure was employed to compute successive multiple regression analyses. The Beta (β) weights were used to estimate the paths between explanatory variables and each new dependent variable. The β criterion of "meaningfulness" (Pedhazur, 1982) for path coefficients was set at ".05" (p. 617) or greater. The direct, indirect and total effects were computed for each variable. Tables of standardized path coefficients, a path model, and an effect table were used in presenting the results of the analysis.

Table 1
Variable Transformation for Black Eighth Graders

Variable	Transformation
Family	
Academic achievement	SQRT(X)
Family structure	Dichotomy
SES	NT
Family educational values	LOG10(X)
Personal	
Motivation	SQRT(K-X)
Ability	NT
Employment	SQRT(K-X)
School	
Curriculum	SQRT(X)
Study time	SQRT(X)
Quality	NT

X = variable being transformed

K = the highest score on the variable + 1

NT = no transformation required

Duncan (1975) as well as Heise (1969) have suggested that path coefficients not meeting the criteria of statistical significance and/or meaningfulness be deleted from the model. Because the obtained sample size for the present study was relatively large, in keeping with the theory trimming approach (Heise, 1969), path coefficients not meeting the criterion of meaningfulness were deleted from the models tested in this study.

Results

Table 2 presents the means and standard deviations for all variables in the study before and after transformation. Table 3 presents the zero order correlations between variables in the model. The highest correlations were found between academic achievement and motivation, $r = 0.44$; ability, $r = 0.42$; and SES, $r = 0.35$. Surprisingly low correlations were found between academic achievement and family educational values, $r = 0.02$; employment, $r = 0.03$; and curriculum, $r = 0.06$.

Standardized Beta coefficients (β) represent path coefficients, and are "used to compare the effects of different variables" (Pedhazur, 1982, p. 629). The criterion of meaningfulness was established as .05. Paths equal to or greater than .05 are regarded as meaningful paths. In large sample analyses, paths that attain the criterion for meaningfulness are invariably statistically significant.

Table 2
Means and Standard Deviations of all Variables in the Study (N = 2730)

Variables	Before Transformation		After Transformation	
	M	SD	M	SD
Academic Achievement	53.54	17.95	7.22	1.29
Family				
Family Structure	4.27	1.68	0.39	0.49
SES	-0.48	0.70	-0.48	0.81
Family Educational Values	9.06	2.29	0.94	0.11
Personal				
Motivation (Z-score)	0.27	5.21	3.00	0.84
Ability	2.73	0.70	2.73	0.70
Employment	2.96	1.14	1.38	0.38
School				
Curriculum	5.51	1.76	2.32	0.39
Study Time	4.08	1.35	1.99	0.34
Quality	14.34	3.06	14.34	3.06

Both direct and indirect effects were important in understanding the explanatory factors of academic achievement. Some variables in the models failed to have a meaningful direct effect on the outcome variable, but when they were influenced by other explanatory variables the change was sufficient to subsequently alter the outcome. The variables that influenced the determinants of academic achievement are mediating variables.

The analyses revealed that some paths failed to satisfy the criterion of meaningfulness (Pedhazur, 1982), (path coefficient $\geq .05$). In accordance with the theory trimming approach (Heise, 1969), these paths were deleted from the model and the analyses repeated. In the over-identified model, the path coefficients and R^2 remained essentially the same as in the original model, indicating stability of the model. The result of the final analyses are reported in the next section.

Findings Regarding Black Eighth Graders

The results of the path analysis indicate five of the nine effect variables meet the criterion of meaningfulness as well as statistical significance. Among the family variables, SES and family educational values had meaningful direct effects. Among the personal variables, motivation and ability had meaningful direct effects. Only one school variable had a meaningful direct effect on academic achievement. Motivation had the largest direct

Table 3
Intercorrelations of Study Variables

Variable	1	2	3	4	5	6	7	8	9	10
1 Academic Achievement	—	.12	.35	.02	.44	.42	-.03	.06	.14	.14
2 Family Structure		—	.22	.07	.14	.10	-.00	.00	.05	.02
3 SES			—	.18	.28	.22	-.05	.03	.08	.03
4 Family Ed. Values				—	.09	.00	-.01	.02	.04	.02
5 Motivation					—	.45	-.06	.09	.22	.25
6 Ability						—	-.06	.13	.10	.17
7 Employment							—	-.04	-.02	-.01
8 Curriculum								—	.04	.11
9 Study Time									—	.15
10 Quality										—

effect on academic achievement (Path Coefficient = 0.28), followed by ability (Path Coefficient = 0.25), and SES (Path Coefficient = 0.24). Both family educational values (Path Coefficient = 0.08) and study time (Path Coefficient = 0.06) had the smallest direct effect on academic achievement. In the family block, family structure showed no direct effect on academic achievement. In the personal block, employment showed no direct effect on academic achievement. Similarly, in the school block, curriculum and quality showed no direct effect on academic achievement.

Regarding questions 2 and 3 on the mediating influence of personal and school variables, the following were found through path analysis. When family related variables were mediated by both personal and school variables, only SES meets the criteria of meaningfulness. Family structure had no direct effect and its indirect effect on academic achievement failed to meet the meaningfulness criterion (indirect = 0.04 and total = 0.04). SES had an indirect effect of 0.13 and total effect of 0.37. Family educational values had an indirect effect of 0.01 on academic achievement and a total effect of 0.09. When personal variables were mediated by school variables, the indirect effect of Ability satisfies the meaningfulness criterion (indirect effect = 0.11 and total effect = 0.36). The indirect effect of employment on Academic Achievement was less than 0.01. Details of the direct

effect of family personal and school variables on academic achievement, the indirect and total effects of family variables mediated by personal and school variables, and the indirect and total effects of personal variables mediated by school variables, are found in Table 4 and Figure 2.

Table 4
Direct, Indirect, and Total Effects of Family and Personal Variables on Academic Achievement of Black Eighth Graders

Explanatory Variables	Effect on Achievement		
	Direct	Indirect	Total
Family			
Family Structure	0.00	0.04	0.04
SES	0.24	0.13	0.37
Family Educational Values	0.08	0.01	0.09
Personal			
Motivation	0.28	0.01	0.29
Ability	0.25	0.11	0.36
Employment	----	----	----
School			
Curriculum	----	NA	NA
Study Time	0.06	NA	NA
Quality	----	NA	NA

Figure 2 illustrates the network of relationships among variables in the model of academic achievement for black eighth-graders. Meaningful direct path coefficients were included. It can be observed that 66% of the variance in academic achievement remains unexplained. Further examination of the model reveals that the combined mediating effects of personal and school variables were only marginal. Family structure had no meaningful indirect effect on academic achievement. SES had a meaningful indirect effect on academic achievement (indirect effect = 0.13), when mediated primarily by motivation and ability. School variables had zero or minimal direct effects, and consequently failed to enhance the effects of variables in the family block. Within the block of personal variables, ability had a relatively moderate indirect effect on academic achievement through motivation (indirect effect = 0.11). When mediated by the less potent school variables the effects of motivation and ability were substantially minimized. The direct effect of motivation on study time was relatively moderate (path coefficient = 0.17), but the marginal mediating strength of study time (path coefficient = 0.06) rendered the indirect path of virtually zero effect. Ability had a relatively moderate direct effect on curriculum but curriculum showed no path to academic achievement.

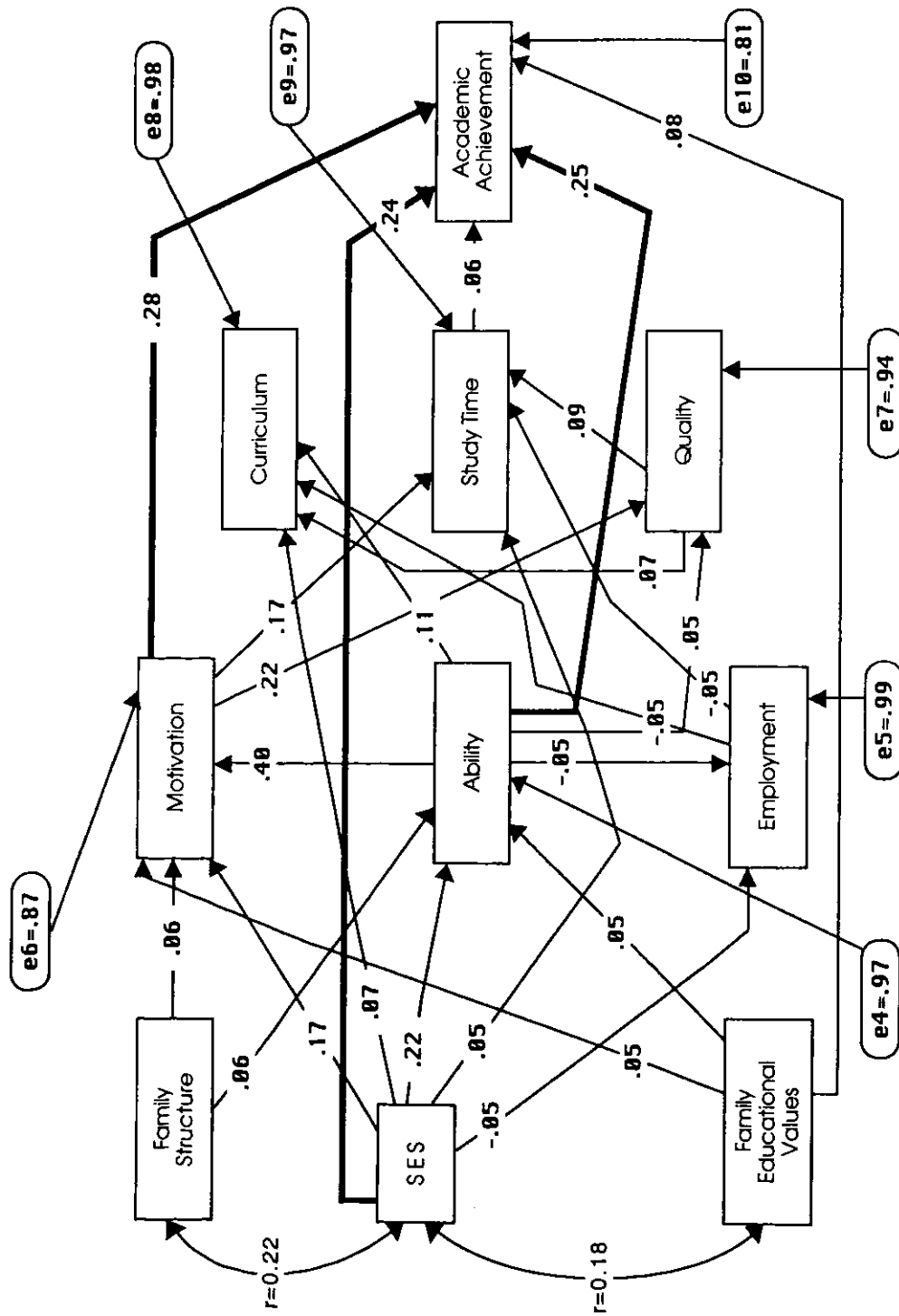


Figure 2. Path model of academic achievement for black eighth-graders

Discussion

The purpose of this study was to examine the relationship between family, personal and school related variables on a composite measure of academic achievement of black eighth graders. The findings suggest that we can predict academic achievement from SES, ability, and motivation, but not from school variables. By comparison, previous research found moderate to strong relationships between academic achievement and SES, motivation and ability (Benbow, Arjman & Walberg, 1991; McCartin & Meyer, 1988; Hossler & Stage, 1992; Duran & Weffer, 1992; Keith and Cool, 1988; Fyans and Maehr, 1987, Benbow and Walberg, 1991; Keith, 1985; Hunt, 1987; Walberg, 1984; Wilson & Allen, 1987).

The relative strength of the relationship between academic achievement and SES, ability, and motivation may have implications for educators of black students. First, the current organization and delivery of schooling may benefit high SES students, a category in which blacks are under represented, but place low SES students at a social and academic disadvantage. Second, given the operational definition of ability (knowledge and skills that have been acquired and demonstrated), and the apparently strong relationship between ability and academic achievement, it seems safe to assume that ability may be improved through appropriate efforts. Thus the findings of this study may have practical implications for black students with low academic achievement as a consequence of low ability. Third, these findings suggest that the motivation of black students (encouragement to conform and to persevere in school) should be carefully undertaken by appropriately qualified individuals, rather than by families that might be dysfunctional, or by the child who might lack the necessary skills for self motivation. It is possible that programmatic innovations designed to compensate for the social and readiness capital lacking in black students, and to improve their ability and motivation, may lead to higher academic achievement in these students.

The non-meaningful relationship between academic achievement and curriculum and quality, and the relatively marginal effect of study time on academic achievement, are inconsistent with findings of earlier studies in which these variables were regarded as important predictors of achievement (Keith, 1982; Keith & Cool, 1988; Rimm & Lowe, 1988; Duran & Weffer, 1992). These findings conflict with earlier outcomes, which indicated that academic achievement is positively related to curriculum enrollment (Pelavin & Kane, 1980; Pennsylvania Association of colleges, 1993-94; Vanfossen et al., 1985; Benbow et al., 1991; Wilson & Allen, 1987; Duran & Weffer, 1992), and quality (Gilbert & Gay, 1988; Sharp, 1989; Keith & Cool, 1988; Walberg, 1984; Fyans & Maehr, 1990; Benbow, Arjman & Walberg, 1991). However, results for the individual variables deserve further examination.

The relatively negligible relationship between study time and academic achievement is atypical in light of its importance as a predictor in earlier studies. The results of this study suggest that the amount of time black eighth graders spend on homework is not a very helpful predictor of academic achievement for these students, given the other variables

in our model. The findings further suggest that there might be other elements or conditions that need to be improved before black students can experience increments in academic achievement by increasing the time they spend studying.

Conceding that curriculum participation is usually an artifact of ability, and that ability is positively related to academic achievement, the absence of any relationship between curriculum and academic achievement for black eighth graders was unanticipated, considering the importance of ability to academic achievement. The results of this study suggest that curriculum participation is not a useful predictor of academic achievement for black eighth graders, given the other variables in this model. Again, this observation implies missing components in the learning paradigm of black eighth graders.

Alternatively, the results regarding curriculum enrollment may be viewed in light of the manner in which the variable was operationally defined. The values analyzed were composite scores from a dichotomous coding of enrollment/non-enrollment in each advanced course. In addition, academic achievement was a composite of reading, math, science, and social studies. The composite nature of these variables may have undermined any possibility of observing the full effect of curriculum on academic achievement. However, curriculum has been similarly operationalized in other studies of achievement with different outcomes (Keith, 1988; Duran & Weffer, 1992).

That quality of instruction had no meaningful relationship with the academic achievement of black eighth graders is uncharacteristic in view of findings by Fyans and Maehr (1987 & 1990), who concluded that the motivation (and in turn achievement) of non-white ethnic groups is likely to be most positively or negatively affected by the quality of the school culture. One possible explanation for the discrepancy between findings might be that Fyans and Maehr's (1990) study related specifically to high school students, whose sensitivity and school experiences might differ from those of middle school students in this study. The findings of this study regarding part time employment failed to support conclusions of earlier studies (Wirtz, 1987; Hotchkiss, 1986; MacArthur, 1990). These researchers observed the expected inverse relationships between part time employment and academic performance. Meanwhile other studies (Barryman and Schreider, 1982; Steinberg, 1982; Greenberger, 1987) found working more than twenty hours per week responsible for real gaps in proficiency between workers and nonworkers.

The trivial relationship between part time employment and academic achievement found in this study might be attributed to the grade level and age group of the subjects. Many of these students are unlikely to hold part-time jobs outside the home and may have been reporting jobs in family owned businesses, or were working less than twenty hours per week. Such jobs are likely to have less impact on the subjects' school work.

Outcomes regarding family structure bear out earlier opposing findings by Prom-Jackson, et al. (1987), McCartin & Meyer (1988), Eagle, (1989) on the one hand and Wilson and Allen (1987) on the other. The findings from the present study show a trivial relationship between family configuration and the academic achievement of black students.

The relatively small relationship between academic achievement and family educational value provides only minimal support for the predominant trend reported in the literature. Like the results regarding study time, family educational values appear to be marginally helpful, at best, in predicting academic achievement of black eighth graders, given the other variables in our model.

The reader is urged to use caution in interpreting the results of this study. Pedhazur (1982, p. 636) describes a set of "very restrictive assumptions" of path analysis, and points out that, "such assumptions are rarely, if ever, met in applied settings, particularly in nonexperimental research." Furthermore, as noted by Pedhazur (1982, p. 636-637),

[T]he formulation of recursive models (i.e., models with unidirectional causation) is unrealistic in many research areas. Moreover, interest in reciprocal causation may be the focus of the research. In studies of academic achievement, for example, one would expect parents' or teachers' expectations to affect students' achievement and in turn to be affected by students' achievement. Similarly, one would expect students' motivation or aspirations to affect students' achievement and to be affected by it.

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