The Influence of Parent Education and Family Income on Child Achievement: The Indirect Role of Parental Expectations and the Home Environment

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This study examined the process of how socioeconomic status, specifically parents' education and income, indirectly relates to children's academic achievement through parents' beliefs and behaviors. Data from a national, cross-sectional study of children were used for this study. The subjects were 868 8–12-year-olds, divided approximately equally across gender (436 females, 433 males). This sample was 49% non-Hispanic European American and 47% African American. Using structural equation modeling techniques, the author found that the socioeconomic factors were related indirectly to children's academic achievement through parents' beliefs and behaviors but that the process of these relations was different by racial group. Parents' years of schooling also was found to be an important socioeconomic factor to take into consideration in both policy and research when looking at school-age children.

The literature on achievement consistently has shown that parent education is important in predicting children's achievement (Klebanov, Brooks-Gunn, & Duncan, 1994; Haveman & Wolfe, 1995; Smith, Brooks-Gunn, & Klebanov, 1997). The mechanisms for understanding this influence, however, have not been well studied. In general, family process models (Linver, Brooks-Gunn, & Kohen, 2002; Yeung, Linver, & Brooks-Gunn, 2002) have examined how parenting behaviors, such as the structure of the home environment, influence children's achievement outcomes. Others have focused on specific behaviors such as harsh parenting, nurturing, and warmth (Conger et al., 2002; Mistry, Vanderwater, Houston, & McLoyd, 2002). There has been less work on how factors like parental beliefs such as achievement expectations or efficacy might function as links between socioeconomic status (SES) and achievement outcomes (for an exception, see Halle, Kurtz-Costes, & Mahoney, 1997). The studies that do exist generally examine young children in low-income or at-risk populations and focus on income-related variables as the moderator variables and family stress as a mediator to achievement outcomes (Conger et al., 2002; Mistry et al., 2002). Thus, researchers have very little understanding of how parent education may influence the beliefs and behaviors of parents of school-age children (the age at which decisions about course selection and supplemental education such as tutoring might be beneficial to later college attendance).

The Influence of Parent Education on Beliefs and Behaviors

Even though the majority of the literature on parents' education pertains to the direct, positive influence on achievement (Jimerson, Egeland, & Teo, 1999; Kohn, 1963; Luster, Rhoades, & Haas, 1989), the literature also suggests that it influences the beliefs and behaviors of the parent, leading to positive outcomes for children and youth (Eccles, 1993). For example, Alexander, Entwisle, and Bedinger (1994) found that parents of moderate to high income and educational background held beliefs and expectations that were closer than those of low-income families to the actual performance of their children, Low-income families instead had high expectations and performance beliefs that did not correlate well with their children's actual school performance. Alexander et al. suggested that the parents' abilities to form accurate beliefs and expectations regarding their children's performance are essential in structuring the home and educational environment so that they can excel in postschooling endeavors. Halle et al. (1997), using a sample of low-income minority families, also found that mothers with higher education had higher expectations for their children's academic achievement and that these expectations were related to their children's subsequent achievement in math and reading. Halle et al. found that these more positive beliefs and expectations predicted higher amounts of achievement-related behavior by mothers in the home as well as more positive perceptions of achievement by the children.

Research on parenting also has shown that parent education is related to a warm, social climate in the home. Klebanov et al. (1994) found that both mothers' education and family income were important predictors of the physical environment and learning experiences in the home but that mothers' education alone was predictive of parental warmth. Likewise, Smith et al. (1997) found that the association of family income and parents' education with children's academic achievement was mediated by the home environment. The mediation effect was stronger for maternal education than for family income. Thus, these authors posited that education might be linked to specific achievement behaviors in the home (e.g., reading, playing). Corwyn and Bradley (2002) also found that maternal education had the most consistent direct influence on children's cognitive and behavioral outcomes with some indirect influence through a cognitively stimulating home environment. Corwyn and Bradley, however, examined only two, quite broad aspects of family mediators: learning stimulation and parental responsivity. Mediation might have emerged if other parent behaviors and attitudes were examined.

The Influence of Race

The literature on race and parenting generally has focused on how European American and African American families differ on parenting styles (e.g., authoritarian or authoritative) and how these styles influence child outcomes (Steinberg, Dornbusch, & Brown, 1992). There has been some debate in the literature about whether family process models work the same for all races and across all SES groups (Conger et al., 2002; Deater-Deckard & Dodge, 1997). Recent research suggests that, at least in the case of the family stress model, there appear to be no racial differences between European Americans and African Americans (Conger et al., 2002; Gutman & Eccles, 1999) or African Americans and Hispanics (Mistry et al., 2002). These findings are relevant mainly to the family stress models that look gen-

erally at low-income samples for which financial stress or strain is most likely to influence parental mental health and functioning. Less is known about how the effects of SES indicators are mediated by family processes in a normative sample of families with a broad distribution on SES variables. Corwyn and Bradley (2002), using a national sample of families, found that household income effects seemed to vary the most by race, with European Americans showing no effects of income and other minority groups (African American, Hispanics) showing small effects. Racial differences did exist in this study but were small and appeared to have little differential impact on any particular child outcome.

Even with the current findings that small or no racial differences exist when looking at SES effects, caution still needs to be used in drawing conclusions about differences and similarities between European American and other ethnic minority groups because of how little is known and understood about the successful workings of minority families (Garcia-Coll & Pachter, 2002). In general, models of successful development have been based on European American, middle-class samples. It is not known whether these are the best models for examining other groups that differ by either race or social class.

Thus, the purpose of this article is to address these issues by testing a cross-sectional model of how parent education influences child development during middle childhood (see Figure 1 for a conceptual model). Even though causality cannot be tested in a cross-sectional model, structural equation modeling can determine whether a model provides a plausible fit to the data. If it does, then one is justified in gathering and testing longitudinal data. The model posited here suggests two specific hypotheses: (a) Parents' education and family income influence children's achievement indirectly through their association with parents' educational expectations and parenting behaviors that stimulate reading and constructive play and provide emotional sup-
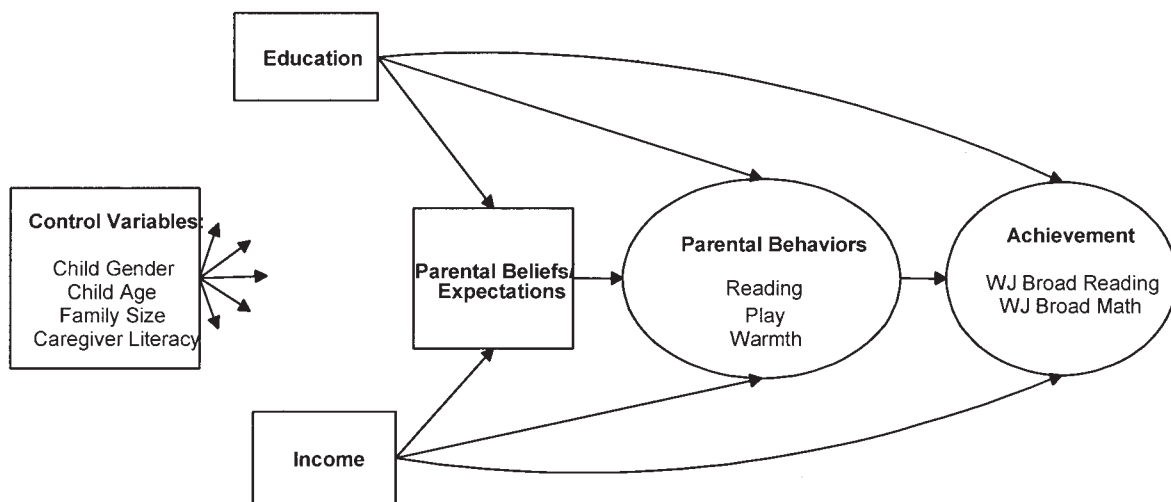

Figure 1. Conceptual model. WJ = Woodcock–Johnson.

port in the home; (b) these predictive relations will be similar across racial groups. The research is guided by a combination of family process models (Conger et al., 2002; Corwyn & Bradley, 2002; Linver et al., 2002; Mistry et al., 2002) and socialization models of achievement that focus on the role of parents' beliefs and behaviors as indirect links between SES and child outcomes (Eccles, 1993; Guo & Harris, 2000). Even though the research on parent behaviors as mediators of socioeconomic influence is growing (Guo & Harris, 2000), few researchers have examined the parent psychological factors (e.g., parental beliefs) that might influence parents' behaviors. By combining these two models, researchers will be able to test their predictors about the pathways through which socioeconomic indicators influence children's achievement. To achieve this goal, I have included constructs of parent education, household income, child characteristics, and both parents' beliefs and parents' home behaviors as predictors of children's academic achievement. This study has three unique features: (a) I tested family process models of the impact of family income and education on the home environment and child outcomes for children in middle childhood (8–12 years of age); (b) I used a more multidimensional indicator of the home environment that separates parents' academic, emotional, and educational activities to get a more nuanced picture of how SES might influence the home environment; and (c) the sample is a national sample with great diversity in family income and education.

Method

Participants

Data from a national, cross-sectional study of children, the 1997 Child Development Supplement of the Panel Study of Income Dynamics (PSID-CDS), were used for this study (Hofferth, Davis-Kean, Davis, & Finkelstein, 1998). The PSID is a nationally representative, longitudinal dataset consisting of survey data on approximately 8,000 of the same families and individuals collected since 1968. In 1997, all PSID families who had children between birth and 12 years of age were recruited to participate in the CDS. When there were more than 2 children in the home that met the eligibility requirement, a random selection process was performed to select those children who would be included in the study. To avoid the problem of perfectly correlated data on the family variables, data from only one randomly chosen child were used for this study. The supplement contains an extensive battery of interviews, assessments, and home observations. The sample for this study consists of 868 8–12-year-olds ($M = 10.7$, $SD = 1.5$), divided approximately equally across gender (435 females, 433 males). This sample was 49% non-Hispanic European American and 47% African American. Because of the small percentage of other ethnic or racial groups in this study ($n = 34$), only European American ($n = 423$) and African American ($n = 411$) families were examined.

Procedures and Measures

The primary caregivers of the children in the sample answered questions regarding their children's health, behavior, home environment, childcare arrangements, schooling, and food security.

The survey (Primary Caregiver Interview) had an 88% response rate for the whole sample and was administered either in the home or through a telephone interview. Participants were given a small monetary gift for their participation in the project. During the home interview visit, children aged 8–12 were administered four subscales of the Woodcock-Johnson—Revised Tests of Achievement (Letter-Word, Passage Comprehension, Calculations, and Applied Problems) and also received a small gift for their participation. Interviewer observations of the home environment were also collected. The response rate (Child Interview Survey) was 81%.

Parent and family characteristics. For this study, three indicators were used to characterize family SES and structure: parent education, parent income, and family size. The PSID-CDS provides information on the education of the head of the household (either male or female, but generally male) and the spouse or cohabitor in the household if one is present. The education of the spouse or cohabitor is available only when there are two adult individuals in the household. Thus, there is no spouse or cohabitor data when a single mother or father heads the household and does not specify another adult as a cohabitor. To get the most accurate picture of the education that is available in the household, I used the highest education in the household as the indicator of family education. This decision allowed me to use data on education for almost all family structures, thus reducing missing data. This construct was highly related to the head of household education ($r = .89$). The mean for highest education in the household was approximately 13.34 years, slightly more than a high school education.

The family income for this sample was based on the income reported in the core PSID interview for 1997. The mean for family income was $48,178; the median was $38,425. Family size is a continuous variable ranging from 2 to 10 individuals ($M = 4.25$; $Mdn = 4.00$).

Finally, a measure of the primary caregiver's literacy was assessed using the Woodcock-Johnson Passage Comprehension Test (Woodcock & Johnson, 1989/1990). The raw scores for this measure ranged between 12.0 and 43.0, with a mean of 30.9 ($SD = 5.3$).

Child demographic characteristic measures. Three variables were used to represent the child's demographic characteristics: age, gender, and ethnic background. Age was measured in terms of months from birth to the time of the interview in 1997. It ranged from 96 months to 144 months. For gender, boys were given a code of "1," and girls were given a code of "0." As stated earlier, only non-Hispanic European Americans (race = 1) and African Americans (race = 0) were used in this sample because of the small number of other ethnic groups represented in this age group.

Parents' educational expectations. Parents' expectation for achievement was measured with an ordinal variable that asked the parent, "How much schooling do you expect that (child) will complete?" The choices ranged from 11th grade or less (education = 1) to M.D., Law, Ph.D., or other doctoral degree (education = 8). The mean for the sample was 5.0 ($SD = 1.92$), indicating that, on average, the parents expected their children to graduate from a 2-year college. Approximately half the sample (49.8%) expected that their child would graduate from a 4-year college.

Parent behavior measures. Latent variables were created for three aspects of the home environment: reading, parent–child play behavior, and parental warmth. Both reading and warmth have been examined in prior studies on the home environment; however, the type of play stimulation that the parent provides for the child is a new home behavior scale that typically has not been used

to examine parental behavior. It has been used as an additional variable that taps the cognitive stimulation in the home that a parent provides but is different from other cognitive stimulation scales in that it incorporates into the measure parental participation with the child.

The reading scale was composed of two items reported by the primary caregivers on how often the child reads for enjoyment (1 = never, 5 = every day) and how many books the child has (1 = none, 5 = 20 or more). Other items were examined to determine whether they could be additional indicators for reading or cognitive stimulation, but items related to the parent reading to the child or time doing homework were negatively related to the other indicators and to the achievement measure, perhaps indicating a compensatory behavior.

The Warmth scale was an interviewer rating scale that assessed six items of parent–child interaction in the home during the home interview. Examples of items include "Parent's voice conveys positive feeling to child?" and "How often did primary caregiver spontaneously praise child for his or her behavior, helpfulness, looks or other positive qualities?" The interviewers scored the parents' responses on a 5-point rating scale ranging from 1 (*often*) to 5 (*never*). Items were reverse scored for analyses and ease of interpretation.

The final parent behavior indicator had four items involving participation with child in play activities (board games, sports, computers, and arts and crafts). Primary caregivers were asked to indicate how often they participated in these activities across a month's time (1 = not in the past month, 5 = every day).

Child achievement measure. Two age-standardized achievement scores of the Woodcock-Johnson—Revised Tests of Achievement were used to measure achievement. This assessment is widely used in national longitudinal studies (e.g., National Head Start Transition Project, NICHD National Child Care Project) and has good psychometric properties, with reliabilities reported to range between .78 and .94 for 8–12 year-old children (Woodcock & Johnson, 1989/1990). Four subscales were used with this sample. Two were combined to create a broad reading variable (Letter-Word and Passage Comprehension) and the other two (Calculations and Applied Problems) were combined into a broad math variable. The scores used in these analyses are the standardized scores for the broad reading and broad math scales. The Woodcock-Johnson test is standardized with a mean of 100 and a standard deviation of 15. The means for both combined scales in this sample are approximately 105, with a standard deviation of 17.3 and 19.2 for reading and math, respectively.

Analysis Plan

To test my hypothesis that parent education and income indirectly influence children's achievement through parental beliefs and behaviors (see Figure 1), I used the Amos 4.0 program for the analysis of moment structures (Arbuckle & Wothke, 1999) to estimate my structural equation model (SEM). Amos uses a maximum likelihood method for obtaining estimates of the parameters. It allows a robust analysis when data on some measures are missing (Arbuckle & Wothke, 1999; Byrne, 2001). As Table 1 indicates, although there are various amounts of missing data across the variables in this study, the largest amount of data missing is less than 15%, which is well within the generally accepted bounds for obtaining accurate estimates with Amos's maximum likelihood procedure. I measured the goodness of fit of the models with three generally accepted indices of fit.

In general, the overall fit of a SEM is determined by the chi-square statistic that tests for comparability between the proposed model and the independence model, in which constructs are assumed to be unrelated (Bollen, 1989). This statistic, however, can be influenced by large sample sizes, and thus, other goodness-of-fit indices are used to provide additional information on the adequacy of fit of the proposed model (Byrne, 2001). There is a broad array of indices that are calculated by the Amos program, but recent research (McDonald & Ho, 2002) recommended that two of these indices (comparative fit index [CFI], root-mean-square error of approximation [RMSEA]), along with chi-square information, are adequate for examining the consistency of fit. The chi-square ratio (χ^2/df) statistic, which adjusts for the chi-square statistic's sensitivity to sample size and the complexity of the model (Byrne, 2001), is examined in the present research. In general, chi-square ratios between 1 and 3 indicate good model fit (Arbuckle & Wothke, 1999). Two other indices that have been shown to be good indicators of fit, CFI and RMSEA, are also reported for the models. Models are considered a good fit if CFIs are greater than .90 and RMSEAs are less than .05 (McDonald & Ho, 2002).

Results

Descriptive statistics (means, standard deviation, ranges, and correlations) for the variables in this study are shown in Tables 1 and 2. The correlations show that the indicators within the latent constructs are related to each other, with the strongest relations among variables in the Warmth scale. The correlations between the two indicators for the Reading scale are low, but the relation to the achievement construct is moderate, supporting the hypothesis that there is a relation between reading behaviors and achievement. The correlations also provide some initial evidence that parent education and income are moderate to strong predictors of achievement outcomes. With the exception of the indicators for the play construct, all correlations related to parent beliefs and behaviors show a low to moderate significant association. Thus, the correlations lend some support to the hypotheses that parents' SES, beliefs, and home behaviors are related to their children's achievement. The correlations also indicate that being European American is related to higher achievement.

Multiple-Group Comparison of Race

To test my hypothesis of no race difference in achievement processes in the home, multiple-group comparisons were conducted using my theoretical process model of parenting influence (see Figure 1). The analysis was conducted by examining the difference between the chi-square for a model with the structural paths constrained and one with no structural paths constrained (baseline model). This procedure directly tests whether the structural process differs across the groups (Byrne, 2001). Both the unconstrained, baseline model ($\chi^2/df \leq 2.35$, CFI $\geq .99$, RMSEA $\leq .04$) and the constrained model ($\chi^2/df \leq 2.37$, CFI $\geq .99$, RMSEA $\leq .04$) fit the data well. The difference in the chi-squares, however, was significant, $\chi^2_{(constrained)} = 770.96/ df (326)$, $\chi^2_{(unconstrained)} = 682.14/ df (290)$, $\chi^2_{(diff)} = 88.82/ df (36)$, $p < .001$, suggesting that the processes by which family SES relates to achievement was not the same for the two racial groups. Thus, SEM analyses were con-

Table 1
Means, Standard Deviations, Sample Size, and Range for All Model Indicators

Variable	M	SD	N	Range
Parent and family characteristics				
Parent education (highest)	13.34	2.29	867	2–17
Family income	$48,178	$46,695	868	$0.00–$577,000
Family size	4.25	1.25	868	2–10
Caregiver literacy (WJ-PC)	30.80	5.30	807	12–43
Child characteristics				
Age	10.69	1.54	868	8.00–13.64
% Male	0.50		868	0–1
% European American	0.49		867	0–1
Parental expectations				
Expected schooling:	5.0	1.92	863	1–8
% High school diploma or less	24.7			1, 2
% Some college/vocational training	7.3			3, 4
% Graduate from 2-year college	5.1			5
% Graduate from 4-year college	49.8			6
% Post-graduate degree	13.0			7, 8
Home behaviors				
Read for enjoyment	4.04	1.08	866	1–5
Number of books	4.65	.73	867	1–5
Arts and crafts	1.75	.95	867	1–5
Sports	2.29	1.20	865	1–5
Video games	2.00	1.22	866	1–5
Games and puzzles	2.15	1.14	867	1–5
Positive feelings	4.22	.97	784	1–5
Warm and affectionate	3.92	1.14	795	1–5
Respond positively	4.07	1.07	782	1–5
Praise	3.00	1.29	799	1–5
Spontaneously spoke	3.87	1.12	784	1–5
Showed warmth	3.94	1.13	801	1–5
Achievement				
Reading	105.42	17.28	744	42–167
Math	105.09	19.24	741	18–162

Note. Percentages are noted for dichotomous and ordinal scale data. WJ = Woodcock–Johnson; PC = Passage Comprehension.

ducted separately for each race, and the hypothesis regarding no race difference in achievement processes in the home was rejected. The results of these analyses appear in Figures 2 and 3. For simplicity, only significant standardized path coefficients are shown for parent education and income, but as dictated by the theoretical model, all direct and indirect paths except for the direct path from child's age to achievement outcomes were tested (standardized path coefficients for all variables in the study can be found in Table 3).

Structural Models for Each Race

The results from the two SEM structural models support my hypothesis that parent education is related to child achievement indirectly through parental expectations and beliefs. The specifics of this indirect relation, however, differed across the two race groups. For African Americans (AA), the model fits fairly well (χ^2/$df \leq 2.14$, CFI $\geq .99$, RMSEA $\leq .05$) and a large percentage of the variance is explained ($R^2 = .55$). Education was related indirectly to child's achievement through expectations/beliefs ($\beta = .23$, $p < .001$), reading ($\beta = .53$, $p < .001$), and warmth ($\beta = .24$, $p < .001$).

For European Americans (EA), the model also fit well (χ^2/$df \leq 2.56$, CFI $\geq .99$, RMSEA $\leq .06$) and explained 51% of the variance in children's achievement. There was an indirect relation of parent education to child achievement through expectations/beliefs ($\beta = .29$, $p < .001$) and reading ($\beta = .38$, $p < .001$). In addition, there was a significant direct effect of education on achievement ($\beta = .13$, $p < .05$), suggesting that this model did not fully explain pathways through which parent education might influence child's achievement in European American families. Finally, there was also a significant direct relation of parental educational expectations to achievement ($\beta = .32$, $p < .001$) for European Americans that was not explained by the indirect paths through parental behaviors.

The results regarding the variables used as controls indicate that, for both races, younger children had more reading behaviors in the home (EA: $\beta = -.20$, $p < .05$; AA: $\beta = -.25$, $p < .001$) and played with their parents more often than did older children (EA: $\beta = -.34$, $p < .001$; AA: $\beta = -.18$, $p < .01$). The more literate a parent, the higher the warmth in both European and African American homes (EA: $\beta = .16$, $p < .01$; AA: $\beta = .21$, $p < .001$) and the lower the amount of parent–child play in African American homes ($\beta = -.18$, $p < .01$). For both races, being female was significantly related to higher amounts of reading (EA: $\beta = -.20$, $p < .05$; AA: $\beta = -.25$, $p < .01$). European American males had slightly higher achievement scores than did European American females ($\beta = .14$, $p < .05$).

Table 2
Correlation Matrices for Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Parent and family characteristics																					
1 Parent education																					
2 Family income	.53																				
3 Family size	.00	.07																			
4 Caregiver literacy	.48	.42	.03																		
Child characteristics																					
5 Age	.04	.03	-.00	-.02																	
6 Sex of child	-.01	.00	.03	.02	.04																
7 Race	.34	.36	.00	.49	-.02	-.05															
Parental expectations																					
8 Expected schooling	.42	.34	-.06	.40	-.01	-.04	.20														
Parental behaviors																					
Reading																					
9 Read for enjoyment	.07	.05	.06	.04	-.16	-.17	-.00	.18													
10 Number of books	.28	.25	-.05	.35	-.06	-.07	.34	.28	.16												
Parent–child play																					
11 Arts and crafts	.06	.08	.07	.05	-.21	-.07	.08	.03	.19	.13											
12 Sports	.11	.12	.02	.06	-.13	.04	.15	.09	.18	.18	.34										
13 Video games	.04	.02	-.02	-.03	-.03	-.01	.02	.15	.10	.07	.26	.27									
14 Games and puzzles	-.02	-.01	.06	-.05	-.15	-.04	.06	.07	.20	.04	.36	.27	.32								
Warmth																					
15 Positive feelings	.22	.21	-.05	.30	-.03	.03	.18	.30	.14	.29	.06	.12	.02	.06							
16 Warm and affectionate	.23	.21	-.06	.29	-.07	.00	.22	.28	.12	.26	.08	.15	.00	.05	.73						
17 Respond positively	.22	.19	-.06	.26	-.03	.01	.19	.23	.11	.28	.08	.13	-.02	.08	.62	.61					
18 Praise	.20	.15	-.06	.27	-.06	-.02	.18	.25	.09	.21	.07	.12	.01	.04	.58	.58	.48				
19 Spontaneously spoke	.17	.18	-.06	.23	-.08	-.05	.22	.24	.12	.26	.12	.13	.04	.06	.58	.56	.72	.51			
20 Showed warmth	.16	.12	.02	.20	.02	.02	.15	.18	.04	.15	.02	.10	.02	.05	.51	.54	.41	.37	.35		
Achievement																					
21 Reading	.38	.35	-.05	.42	-.05	-.05	.35	.44	.24	.30	.10	.10	.05	.02	.29	.26	.23	.22	.22	.14	
22 Math	.38	.33	-.01	.40	-.09	.05	.33	.44	.19	.27	.06	.13	.06	.06	.32	.30	.21	.22	.21	.17	.71

Note. Significant two-tailed correlations are in boldface. Correlations between .07 and .09 are significant at the $p \leq .05$ level; correlations between .10 and .11 are significant at the $p \leq .01$ level, and correlations .12 and above are significant at the $p \leq .001$ level.
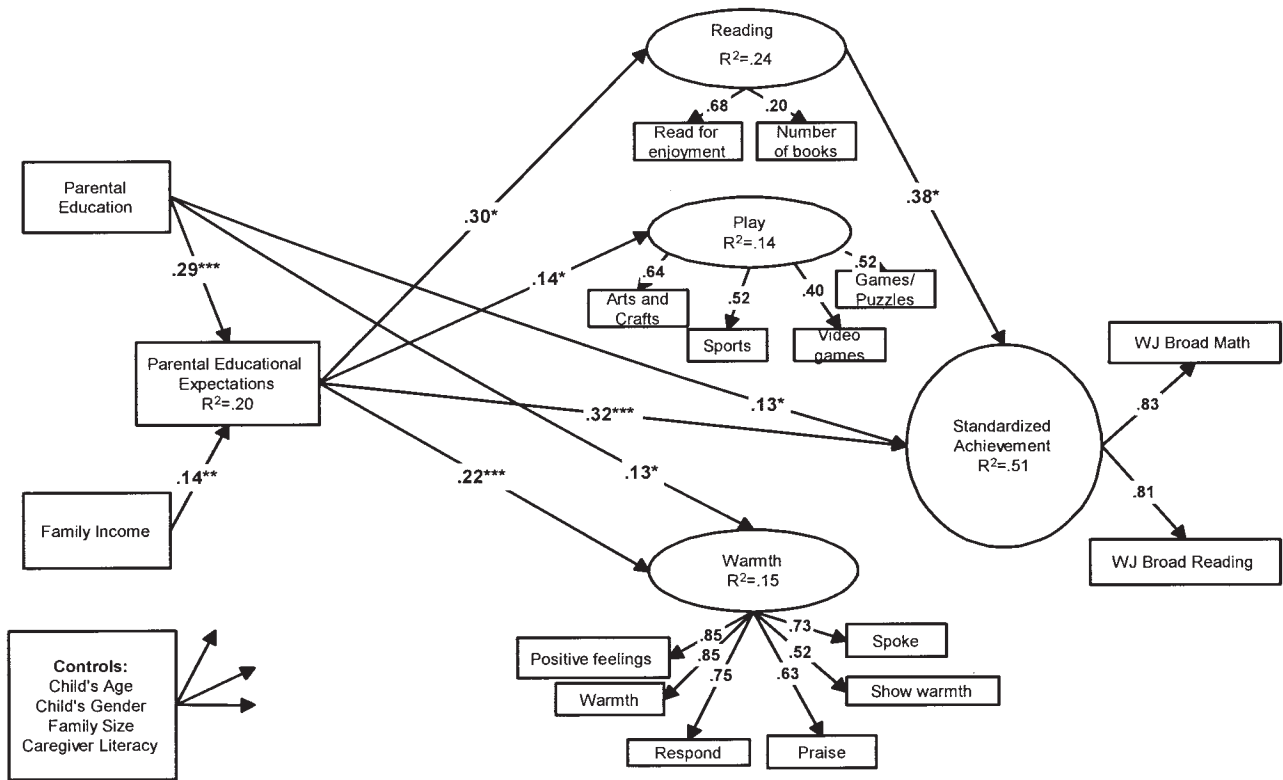
Figure 2. Parental influence on achievement: European Americans. WJ = Woodcock–Johnson. Model fit statistics: χ^2 = 371.98, *df* = 145; χ^2/df = 2.57; CFI = .99; RMSEA = .06. *p < .05. **p < .01. ***p < .001.

Subsequent analyses (not presented here), however, showed that this gender effect was only true for math achievement. Finally, the larger the family size for African Americans, the lower the reported warmth in the home (β = −.13, p < .01).

To offer a sense of the effects of all of the variables in the model on achievement, the standardized direct, indirect, and total effects are presented in Table 3. The total (direct and indirect) effect of parent education on children's achievement was moderate in European American families and small in African American families. Income had a small, indirect effect on the African American sample, with a slightly stronger total effect for the European Americans. Gender had a small total effect on achievement in both racial groups, with the effect favoring males in the European American sample and females in the African American sample. The effect in the African American sample is derived almost entirely through the indirect effect on achievement. It is possible that the moderate, direct effect of gender (favoring females) on reading in the home is responsible for this indirect influence. Parental expectations for schooling had a moderate total effect on achievement in both samples, but the majority of this effect was direct in the European American sample and indirect in the African American sample.

Although both the models fit the data extremely well, as

indicated by the fit indices, it is possible that there might be alternative models that might fit the data as well or better. To test this possibility, a model that examined only the direct influence of the SES and family background variables on achievement, with no mediation of beliefs and behaviors, was compared to the mediated model. The mediated model fits better than the direct model, $\chi^2_{(mediated)}$ = 682.14, df = 290; χ^2/df ≤ 2.35, CFI ≥ .99, RMSEA ≤ .04, vs. $\chi^2_{(direct)}$ = 1167.36, df = 344; χ^2/df = 3.39, CFI = .98, RMSEA = .05, and the difference in the chi-squares was significant, $\chi^2_{(diff)}$ = 485.22, df = 54, p < .001, indicating that the mediated model fit the data more parsimoniously.

Discussion

This study examined the family processes that might indirectly link parent education and other family background indicators, such as income, with child achievement. I hypothesized that this indirect link would work through the parents' educational expectations, reading, play, and affective behaviors. Past research has focused mainly on the influence of family income on child outcomes, with relatively less attention paid to the role that parents' education might play. My hypothesis that parents' education influences child achievement indirectly through its impact on the parents' achievement beliefs and stimulating home behav-
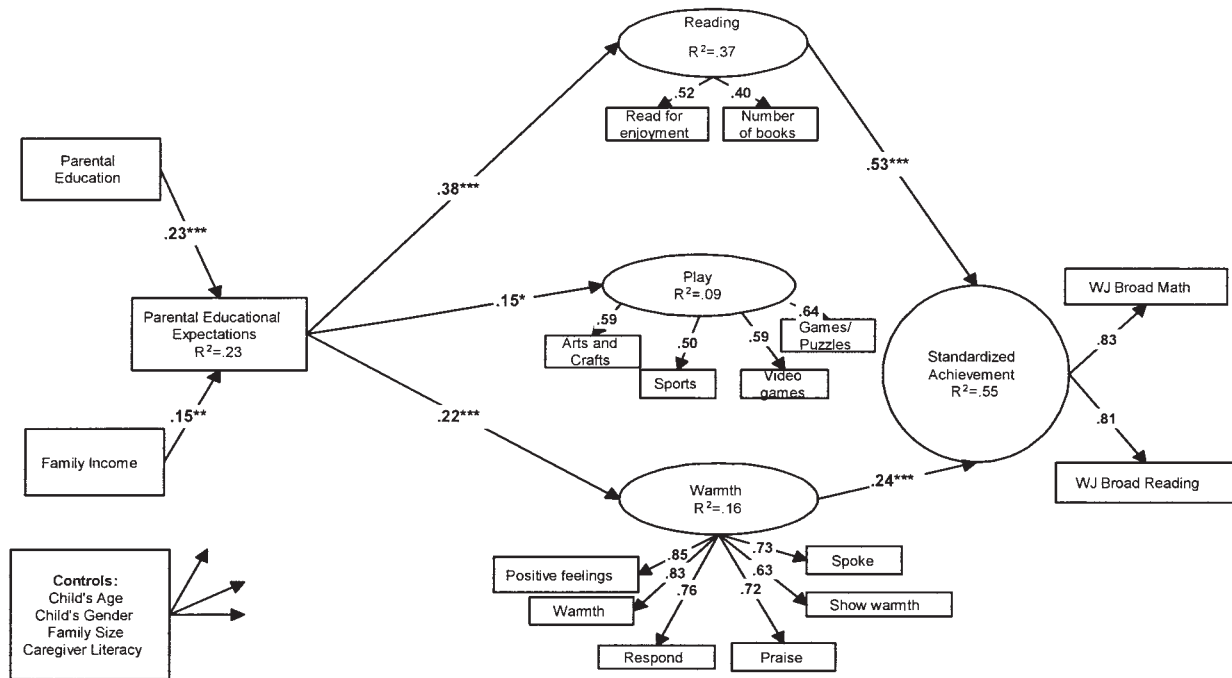
Figure 3. Parental influence on achievement: African Americans. WJ = Woodcock–Johnson. Model fit statistics: $\chi^2 = 310.20$, $df = 145$; $\chi^2/df = 2.14$; CFI = .99; RMSEA = .05. $*p < .05$. $**p < .01$. $***p < .001$.

iors was supported. The exact nature of the indirect process of how parents' educational attainment influences children's achievement, however, differed for the two racial groups examined in this study. Thus, my hypothesis of no race differences in the processes linking parental education to children's achievement was not supported. This finding was somewhat surprising given previous (but limited) work on the influence of race when examining the effects of SES on child outcomes.

For the African American sample, the relations of both parents' educational attainment and family income were related indirectly to children's achievement through the parents' educational expectations and the reading and the warmth of parent–child interactions. Reading and parental warmth continued to have predictive relations with achievement even after family background and expectations were controlled. This pattern of results is consistent with my hypothesis that parents' years of schooling and family income positively influence the types of literacy-related material and behavior in the home as well as the affective relationship between parents and children. It is interesting that, even though parents' educational expectations predicted the amount of parent–child involvement in play activities, the actual play behavior had no relation with achievement. It is possible that this is due to the ages of the children in this study. By middle childhood, it is possible that parent–child play is more closely related to the relationship between the parent and child than are achievement-related activities.

The theoretical model proposed does a very good job in explaining the role of parents' educational attainment and family income in predicting academic achievement behaviors of African American families. The story, however, was quite different for the European American sample. For this sample, parents' education had both a direct and indirect relation to children's academic achievement. The overall total effect of parent educational attainment on child achievement was much stronger than the total effect of income. The results for the SEM model suggest that the association between family SES characteristics and children's academic achievement is not fully explained by the indirect paths included in my model. Parents' years of schooling had a moderate relation to parents' educational expectations, which, in turn, had a moderate direct relation to children's achievement, indicating that parents' education does relate to expectation beliefs. Parents' education also had small positive relations with all three parenting variables. The Reading scale, however, was the only parenting behavior that had a direct relation with children's and parents' education after all other variables were included in the model. Thus, further study is needed to determine what home behaviors are mediating the effects of education in European American homes. It is possible that home activities that encourage academic competence, such as homework monitoring, assistance with school projects, or going to science museums or libraries, will have stronger relations with achievement. This is an avenue of research to pursue in the future in understanding the complex role that parents' education plays in predicting children's academic achieve-

Table 3
Standardized Direct, Indirect, and Total Effects for All Variables in the Model by Race

Predictor	Dependent variable	European Americans			African Americans		
		Total effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect
Parent education	Parental expectation	.29	.29***	—	.23***	.23***	—
	Reading	.11	.03	.08	.16	.07	.09
	Parent–child play	.05	.01	.04	.06	.03	.03
	Warmth	.19	.13*	.06	.01	−.04	.05
	Achievement	.27	.13*	.14	.10	.00	.10
Income	Parental expectation	.14	.14**	—	.15	.15**	—
	Reading	.08	.04	.04	.12	.06	.06
	Parent–child play	.12	.10	.02	.01	−.01	.02
	Warmth	.01	−.02	.03	.12	.09	.03
	Achievement	.17	.09	.08	.11	.00	.11
Family size	Parental expectation	−.16	−.16***	—	−.05	−.05	—
	Reading	.03	.08	−.05	−.02	.00	−.02
	Parent–child play	−.05	−.03	−.02	.13	.13*	−.00
	Warmth	.02	.05	−.03	−.14	−.13**	−.01
	Achievement	−.11	−.07	−.04	−.05	.01	−.06
Caregiver literacy	Parental expectation	.09	.09	—	.26	.26***	—
	Reading	.16	.13	.03	.20	.10	.10
	Parent–child play	−.04	−.05	.01	−.14	−.18**	.04
	Warmth	.18	.16**	.02	.26	.21***	.05
	Achievement	.19	.11	.09	.35	.14	.21
Age	Parental expectation	−.04	−.04	—	−.02	−.02	—
	Reading	−.21	−.20*	−.01	−.26	−.25***	−.01
	Parent–child play	−.34	−.34***	.00	−.18	−.18**	−.00
	Warmth	−.09	−.08	−.01	−.04	−.04	−.00
	Achievement	−.09	—	−.09	−.13	—	−.13
Gender	Parental expectation	−.03	−.03	—	−.06	−.06	—
	Reading	−.21	−.20*	−.01	−.27	−.25**	−.02
	Parent–child play	.03	.03	.00	−.07	−.06	−.01
	Warmth	.09	.09	.00	−.05	−.04	−.01
	Achievement	.05	.14*	−.09	−.04	.12	−.16
Parental expectations	Reading	.30	.30*	—	.38	.38***	—
	Parent–child play	.14	.14*	—	.15	.15*	—
	Warmth	.22	.22***	—	.22	.22***	—
	Achievement	.43	.32***	.11	.34	.10	.24
Reading	Achievement	.38	.38*	—	.53	.53***	—
Parent–child play	Achievement	.00	.00	—	−.10	−.10	—
Warmth	Achievement	.00	.00	—	.24	.24***	—

Note. Significance tests are only reported for direct effects. Dashes represent empty cells or no information because the paths are not tested in the model.
* $p < .05$.   ** $p < .01$.   *** $p < .001$.

ment in European American samples as well as other racial groups.

This study has added to the literature on the influence of distal family background variables in important ways. First, the paths linking these variables to children's academic achievement differed by racial group. Previous research on low-income samples has suggested that there is little difference in how these variables might influence children's academic achievement (Gutman & Eccles, 1999). The present research used a much broader national sample and found some important differences in the paths linking education and income to children's academic achievement. To truly understand how parent beliefs and behaviors ultimately impact child development, it will be important in future research to replicate this finding as well as to examine how these processes might differ by racial group.

Second, the results suggest that the amount of schooling that parents receive influences how they structure their home environment as well as how they interact with their children in promoting academic achievement. This finding indicates that the economic difficulties, which certainly still exist in many American families, do not necessarily constrain academic development. It is possible that parents as "coteachers" in the home may find a better psychological balance of stimulation and demand for their children when they themselves were successful in academics. Although poverty certainly is a major threat for child development, a closer look at the underlying mechanisms may help explain why so many poor children perform well in school despite restricted material resources. If parents are successful in providing an emotionally stable and stimulating environment, the negative effects of financial restrictions can be minimized. This finding is consistent with evidence that the influence of family income declines as children age (Duncan & Brooks-Gunn, 1997). Although poverty has an important relation to developmental outcomes in the early

years of development, it may have less influence on outcomes during middle childhood and adolescence. During these years, parents' education may help parents be more efficient teachers at home because they are more likely to know something about what the children are being taught and thus able to help with homework and to provide appropriate cognitive stimulation when children are not in school (Alexander et al., 1994).

A third strength of this study is the addition of parental expectations for achievement as a predictor of parents' behaviors as well as children's achievement. As predicted by the Eccles socialization model (Eccles, 1993), parents' educational expectations had both direct and indirect effects on children's academic achievement scores for the European American sample and a strong indirect influence in the African American sample. Both of these patterns exist even when parents' education is controlled. These findings are consistent with previous research documenting the strong relations between parental expectations and beliefs and achievement outcomes (Alexander et al., 1994; Hoover-Dempsey & Sandler, 1997). Thus, the expectation that a child will graduate high school versus attend college has important implications for the types of stimulation provided in the home as well as an indication of the affective relationship between parent and child. This association can reflect two processes: (a) the provision of a more cognitively stimulating and emotionally supportive environment from the beginning and (b) an increased ability to adjust the home environment to meet the needs of their children as the parents receive information about their children's performance in school (Hoover-Dempsey & Sandler, 1997).

Finally, there are small but notable gender effects in the model. European American boys and African American girls were more likely to have higher achievement scores. These gender effects for test scores are consistent with other standardized achievement test outcomes, even though the effects, as in the present study, are small (Halpern, 2000). Thus, even though there are gender differences, they should be interpreted cautiously given the small magnitude of the finding.

Even though this study has many interesting findings to contribute to the literature, there are features that limit the generalizability of these findings. One of the strongest limitations is the use of cross-sectional data to test process models. In an attempt to get a more heterogeneous, representative sample that was not biased in terms of income or region of the country, a national dataset was used. Unfortunately, this dataset only had information from parents and children at one time point. Thus, it was not possible to examine these processes longitudinally, which would have provided a better test of my causal hypotheses.

In summary, this study has demonstrated that the relation of parents' educational attainment to children's academic achievement is indirectly related through parents' educational expectations and specific parenting behaviors. The exact nature of this link differs by racial group, and it is important that future studies of family process examine these differences. Parents' educational attainment has been found to be one of the most critical variables in the mortality

of children across the world (Desai & Alva, 1998; Elo & Preston, 1996) and seems to be a major variable in children's well-being in general (Chen, Matthews, & Boyce, 2002). Furthermore, for both African Americans and European Americans, the indirect link of parents' education to parents' behaviors is substantially related to parents' educational expectations for their children. Thus, researchers and policymakers should examine the mechanisms that might be leading to these effects.

Even though education is by no means a quick intervention, it is more permanent and perhaps has more impact on the home environment across youth development than what might be expected from temporary increases in income. This is particularly important for current welfare policy, where little incentive or compensation is given to those who want to obtain additional education. Some researchers would suggest that it is hard to intervene on parents' educational attainment (Lee & Croninger, 1994). Research using experimental intervention studies, however, suggests that it is possible to make a difference even from small increases (Magnuson & McGroder, 2001). The foundations of an intervention already exist in America, where education is available to all citizens. What would be needed are not additional buildings or agencies but the review of programs and policies that might be leading disadvantaged youth to leave school early and not return or acquire an equivalent degree. If more parents, and subsequently more children, can become better educated, it might lead to better outcomes for children (as has been found in the health literature).

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