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The Effects of Socioeconomic Status, Race, and Parenting on Language Development in Early Childhood

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The authors examined the associations between socioeconomic status (SES), race, maternal sensitivity, and maternal negative-intrusive behaviors and language development in a sample selected to reduce the typical confound between race and SES ($n = 146$). Mother–child interactions were observed at 12 and 24 months (coded by randomly assigned African American and European American coders); language abilities were assessed at 18, 24, 30, and 36 months. For receptive language, race was associated with ability level, and maternal sensitivity and negative-intrusive parenting were related to rate of growth. For expressive communication, race, SES, and maternal sensitivity were associated with rate of growth; race moderated the association between negative-intrusive parenting and rate of growth such that the relation was weaker for African American than for European American children. The results highlight the importance of sensitive parenting and suggest that the association between negative-intrusive parenting and language development may depend upon family context. Future work is needed concerning the race differences found, including examining associations with other demographic factors and variations in language input experienced by children, using culturally and racially validated indices of language development.

Keywords: socioeconomic status, race, parenting, language development

Early language is associated with later academic achievement (Craig, Connor, & Washington, 2003; Magnuson & Duncan, 2006; National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network, 2005; O'Neill, Pearce, & Pick, 2004; Scarborough, 2001; Stevenson & Newman, 1986; Storch & Whitehurst, 2002). Thus, understanding the factors that are related to young children's language development has important implications for implementing early education programs aimed at enhancing school readiness and reducing the achievement gap in academic success that exists at present between African American and European American children in the United States. Numerous studies have documented the negative associations between low family socioeconomic status (SES) and ethnic minority status on children's language development (Dearing, McCartney, & Taylor, 2001; Elardo, Bradley, & Caldwell, 1977; Johnson, 2001; Siegel, 1982; Walker, Greenwood, Hart, & Carta, 1994). However, in contemporary Western societies, SES and race are often confounded (Skiba, Poloni-Staudinger, Simmons, Feggins-Azziz, & Chung, 2005), making it difficult to examine the unique effects of either variable. In addition, proximal processes in the home influence children's cognitive outcomes, and research suggests that the effects of parenting practices may vary by cultural context (Baumrind, 1972; Deater-Deckard & Dodge, 1997; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Garcia Coll, 1990; Garcia Coll et al., 1996). The current study adds to our understanding of this topic by investigating the associations between SES, race, and parenting and young children's language development over time in a sample selected to reduce the typical confound between SES and race; by examining the unique associations between maternal sensitivity and negative intrusive behaviors with receptive and expressive abilities; and by exploring whether the associations between parenting and language outcomes are moderated by SES and race.

SES, Race, and Language Development

Researchers have consistently found associations between high-risk demographic factors, such as SES and minority status, and language outcomes in young children. One of the earliest studies on this topic was Hart and Risley's (1992, 1995) longitudinal observations of 40 African American and European American parents from various socioeconomic backgrounds interacting with their infants. Demographic variables were linked to children's 36-month IQ scores and language ability. Specifically, lower SES parents, all of whom were African American, had children with the lowest language skills and shortest mean length of utterance compared with children displaying more advanced language skills, who were predominantly European American and from higher SES families. Consistent with these findings, Lawrence (1997) found that middle-class and European American preschool chil-

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dren had longer mean lengths of utterance than African American and working-class children on tasks requiring children to label and provide additional information about a particular picture. Similarly, Raviv, Kessenich, and Morrison (2004) examined the 1,016 families of the NICHD Study of Early Child Care and found that SES was significantly associated with children's language ability at 36 months.

Identifying the unique relationships between children's outcomes and SES and race has been difficult because of the usual confounding of these variables in the societies where most of the research has been conducted. In most studies using diverse samples, African Americans have been more likely to be of lower SES than other racial groups (McLoyd, 1998; McLoyd & Ceballo, 1998; Skiba et al., 2005). The U.S. Census Bureau reported that in 2005, 33% of African American children under the age of 18 years old were living in homes rated as "below poverty," compared with less than 10% of European American children (Denavas-Walt, Proctor, & Lee, 2006). In addition, this report found that African Americans had the lowest median household income compared with European American, Asian, and Hispanic households. Given this confounding and the use of traditional sampling techniques, determining whether associations with language are due to SES or to race has been virtually impossible, and both relationships are theoretically plausible. Whereas a lack of resources and opportunities because of low family SES and the other stressors that are associated with poverty may affect children's outcomes (Evans, 2004), discrimination and racism experienced by ethnic minority families may also negatively influence children's development (Murry, Brown, Brody, Cutrona, & Simons, 2001; Prelow, Danoff-Burg, Swenson, & Pugliano, 2004). We examined the links between SES and race with children's receptive and expressive language between 18 and 36 months in a sample in which the typical confound between SES and race was reduced to explore the possible differing associations with SES and race. Given that 18 to 36 months is a time when adaptive or maladaptive development begins (Shaw et al., 1998), a greater understanding of the unique relationships between these demographic variables and children's language outcomes may have important implications for programs aimed at enhancing the school readiness of children at high risk for poor academic outcomes because of environmental circumstances.

Parenting and Language Development

In addition to the demographic factors of SES and race, parenting practices have also been related to children's language development (Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997; Elardo et al., 1977; Hart & Risley 1992; Linver, Brooks-Gunn, & Kohen, 2002; Mistry, Biesanz, Taylor, Burchinal, & Cox, 2004; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Among the many relevant parenting factors that have been investigated are sensitivity (i.e., responsive caregiving and interactions) and negative intrusive behaviors (i.e., intrusive, controlling, and punitive interactions).

Sensitive parenting has been linked with positive child outcomes, including early language knowledge and literacy development (Birch & Ladd, 1996; Dodici, Draper, & Peterson, 2003; Pianta, 1997; Pianta, Nimetz, & Bennett, 1997; Pianta & Walsh, 1996). A responsive and emotionally supportive parent provides an interactive environment for young children to engage in reciprocal verbal and nonverbal exchanges that are stimulating and rewarding for the child. Tamis-LeMonda et al. (2001) found that maternal responsiveness was associated with the achievement of language milestones during infancy and early toddlerhood, and Mistry et al. (2004) found that maternal sensitivity was significantly associated with expressive and comprehensive language skills at 36 months of age. Similarly, Raviv et al. (2004) found that both maternal sensitivity and cognitive stimulation were independently related to 36-month-old children's language outcomes.

Negative intrusive parenting has received less attention in studies of early language development. This dimension of parenting behavior focuses on the degree to which the parent interferes with the child's needs, interests, or behaviors, above and beyond the developmental or safety needs of the child. Intrusive and controlling behaviors (such as unnecessarily restraining the child, consistently disrupting the child's efforts with his or her own bids for attention, or verbally controlling the child with repeated and unnecessary direction) reflect the parent's imposition of his or her own agenda onto the child and his or her failure to understand and recognize the child's effort to gain autonomy and self-efficacy (Egeland, Pianta, & O'Brien, 1993). Characterized by highly controlling and negative behavior directed toward the child, negative intrusiveness can undermine children's autonomy and confidence and has been linked to negative child outcomes, including regulatory and socioemotional problems (Heller & Baker, 2000; Mistry, Melsch, & Taheri-Kenari, 2003; Rubin, Burgess, Sawyer, & Hastings, 2003) and lower academic achievement (Culp, Hubbs-Tait, Cuilp, & Starost, 2001). The limited research on early language development and negative intrusive parenting has produced mixed results, with some studies suggesting that links with negative intrusive parenting are accounted for by maternal sensitivity and other studies suggesting that maternal negative intrusiveness and maternal sensitivity have independent associations with language outcomes. Tamis-LeMonda, Shannon, Cabrera, and Lamb (2004) found that negative intrusive parenting was related to child language outcomes at 24 and 36 months of age, but these were subsumed by parental sensitivity. In contrast, Keown, Woodward, and Field (2001) found that both sensitivity and negative intrusiveness had independent relations with preschoolers' language comprehension and expression. Furthermore, their findings indicated that negative intrusive behavior accounted for differences in comprehension and expression scores between children of teenage and comparison mothers. These findings suggest that maternal sensitivity and negative intrusive parenting may contribute independently to early language development and that their contributions may differ depending on developmental timing and environmental context. Thus, another goal of this study was to examine the separate links of maternal sensitivity and negative intrusive behaviors with early language development.

SES, Race, Parenting, and Language Development

Although theory and research suggests that sensitive and negative parent–child interactions influence young children's language outcomes in general, their relations with children's development may vary by race (Garcia Coll, 1990; Garcia Coll et al., 1996). For example, the associations between negative intrusive parent–child interactions may be stronger for European American children than

for children in other racial and ethnic groups (see review by Bugental & Grusec, 2006; Deater-Deckard & Dodge, 1997). Ispa et al. (2004) found that parent intrusiveness predicted 25-month negativity for European American children. However, for African American children, parent intrusiveness predicted 25-month negativity when parents exhibited low levels of warmth. Further, certain parenting practices may be more or less adaptive depending on the settings in which children are raised (e.g., setting strict limits on children who live in a dangerous environment; see Parke & Buriel, 2006). Thus, another goal of this study was to investigate whether the associations between parenting and young children's language outcomes vary by SES and race.

Current Study

A convenience sample in a contemporary Western society would inevitably confound family SES and racial status. Statistical controls can be applied, but they must be interpreted in a nebulous counterfactual conditional frame in which complex aspects of life (e.g., family income, education) are treated as model parameters that can be raised or lowered independently of other variables. We used an alternative strategy, which was possible because the research was conducted in a city in the southeastern United States in which an economically diverse group of African Americans and European Americans could be selected. The main goals of the study were to use this unique sample (a) to examine the associations between SES (measured on the basis of income and maternal education) and race (measured as a self-reported category) and early language development (measured using a standardized test of receptive and expressive abilities) from 18 through 36 months, (b) to investigate the separate links of maternal sensitivity and negative intrusive parenting (measured using detailed analysis of videotapes recorded during mother–child interactions in a laboratory) with these outcomes, and (c) to explore whether SES and race moderate the relations between these parent–child proximal processes and children's language outcomes.

Method

Participants

Participants were drawn from a largely urban community via fliers and postings at birth and parenting classes, as well as through mailings and phone contact inviting participation in a longitudinal study of child health and development. To reduce the typical confound between SES and race, recruitment was focused on four groups: African American middle-income, African American low-income, European American middle-income, and European American low-income families (these groups were used to guide recruitment only, not for analytic purposes). A total of 206 families comprised the full sample. Of these, 25 families either withdrew or were dropped because they were missing one or more scores for predictor variables. These 25 families were compared with those retained in the sample to determine whether they differed on background characteristics; no significant differences were found for race, SES, or maternal age.

Despite recruitment goals, preliminary analyses revealed that African American families were overrepresented in the low end of the SES distribution and European American families were overrepresented in the high end of the SES distribution (the creation of the SES variable is described below). Thus, the effects of income and race could not be separated in the extremes of the distribution range. Given our goal of examining the effects of income and race in a sample in which the confounding of these variables was reduced, we focused on a constrained range of social strata for which we had adequate data to make racial comparisons. Specifically, to ensure that the shape of the SES distribution was similar for each racial group, we dropped the outliers in portions of the SES distribution in which there was little or no overlap for African American and European American families and focused our analyses on a sample in which there was considerable overlap in the SES distribution. This constraint eliminated 31 African American families and 1 European American family with very low SES (a value of less than −2.41 on our SES scale, described below) and 3 European American families with very high SES (a value greater than 6.00 on our SES scale). In addition to differing in terms of SES, mothers from the 35 excluded families were younger (M = 24.73 years, SD = 5.26, range = 18–37 years vs. M = 28.78 years, SD = 5.53, range = 18–40 years) compared with the 146 families included in the analyses.

Of the 146 families retained for analysis, 50% (n = 73) were African American and 50% (n = 73) were European American. The sex distribution of children was comparable across the race groups, with 48% of the European American children being females and 52% of the African American children being females. At the 18-month time point (the time point at which language assessments began), maternal average years of education was 14.78 years (SD = 2.10, range = 10–20 years) for African Americans and 15.30 years (SD = 2.16, range = 10–20 years) for European Americans; the difference was not significant, $t(144)$ = 1.51, p = .13. On our SES scale, at the 18-month time point, the mean was 0.18 (SD = 1.82, range = −2.38–4.80) for African American families and 0.61 (SD = 1.98, range = −2.23–4.70) for European American families; the difference was not significant, $t(144)$ = 1.44, p = .15. To put this in context, the range for this SES variable was −2.38 to 4.80, with a mean of 0.42. The average family size was approximately four and ranged from 3.71 at 12 months for European American families to 4.12 at 36 months for African American families; family size was also not significantly different across racial groups. In contrast, marital status and race were not independent, $\chi^2(3, 146) = 10.68$, $p < .05$; European American families were more likely to be married or cohabiting (90% of European American compared with 70% of African American families; a total of seven families in each group were classified as cohabitating specifically) and African American families were more likely to be single, never married (26% of African American compared with 8% of European American families).

Measures and Procedure

SES. Mothers provided information on family income and their education level at child ages 6, 12, 30, and 36 months. Each family's income-to-needs ratio (INR) was computed by dividing the total family income by the poverty threshold for the appropriate family size, as determined by the U.S. Department of Health and Human Services. Repeated-measures analysis of variances revealed no race differences in INR or education at any of the time points and no overall Race × Time interactions for INR,

$F(1, 116) = 1.37$, $p = .24$, and for education, $F(1, 116) = 2.27$, $p = .13$. An index for SES was created by standardizing INR and maternal education level and taking the average of these variables across the time points. Bivariate correlations of SES across the four time points revealed consistency across time, with stability coefficients ranging from .78 to .92.

Language development. The Preschool Language Scale–4 (Zimmerman, Steiner, & Pond, 2002) is composed of two subscales: the Auditory Comprehension subscale that evaluates what children know or understand but may not say and the Expressive Communication subscale that evaluates what children say. Care was taken in the development of this measure to ensure its validity for use with different racial groups. The standardization sample was composed of a diverse sample (39.1% ethnic minority children included); experts reviewed all items for ethnic, gender, and socioeconomic bias; and statistical procedures tested for item bias (Zimmerman, Steiner, & Pond, 2004).

The tasks designed to assess auditory comprehension for toddlers focus on skills considered important precursors for language development, such as attention to speakers (e.g., looks at objects or people the caregiver calls attention to) and appropriate object play (e.g., demonstrates appropriate use of play materials including a ball). Tasks designed to assess auditory comprehension for preschool-aged children focus on comprehension of basic vocabulary (e.g., parts of the body including the nose), concepts (e.g., spatial concepts including "in"), and grammatical markers (e.g., pronouns including "me"). The tasks designed to assess expressive communication in toddlers focus on vocal development (e.g., produces different types of vowel–consonant sounds) and social communication (e.g., uses vocalizations and gestures to request toys or food). Tasks designed to assess expressive communication in preschool-aged children ask children to name common objects (e.g., ball), use concepts that describe objects and express quantity (e.g., how many chicks there are in a picture), and use specific prepositions, grammatical markers (e.g., verb + *-ing*), and sentence structures (e.g., produces basic four to five word sentences).

Children's expressive communication and auditory comprehension were assessed at 18, 24, 30, and 36 months during testing sessions conducted in a laboratory that the child had visited several times before. The Preschool Language Scale–4 correlates with other standard measures of language development, with internal consistencies ranging from .67 to .88 for the subscales and test–retest reliabilities ranging from .82 to .95. In the present data, the internal consistencies (Kuder–Richardson 20) for the subscales ranged from .77 to .84 for Auditory Comprehension and from .72 to .82 for Expressive Communication across the four time points. Age equivalent scores were used in the current analyses, given the interest in examining growth in language over time.

Parenting behaviors. Maternal behavior was observed during a 10-min semi-structured mother–child free play episode at 12 months of child age and during a 10-min puzzle completion task at 24 months of child age. Both tasks were conducted during laboratory visits with the mother and child. For the free play task, mothers and children were presented with a standardized set of toys and asked to play as they normally would during the day; the interaction lasted for 10 min. For the puzzle task, mothers and children were seated at a table, a puzzle was placed before them, and the pieces were removed. Mothers were informed that this was a task for the child but that they could help in any way they wanted. After the completion of the first puzzle, a second (and third if necessary) puzzle of increasing difficulty was given to the child. If the third puzzle was completed before the 10 min had passed, then the mother was asked to continue playing with the child and third puzzle for the remainder of the time. The mother–child interactions at each time point were videotaped for later coding.

Trained and reliable coders assessed seven dimensions of maternal behavior adapted from Egeland and Heister (1995) and the NICHD Early Child Care Research Network (1997). Each behavioral dimension was double coded on a 5-point scale at 12 months and a 7-point scale at 24 months (for the current analyses, the 7-point scale was calibrated to make it comparable with a 5-point range and distribution). Interrater disparities were resolved by conferencing. Coders were not race matched with participant families; rather, African American and European American coders were randomly assigned. Every pair of coders maintained a minimum .80 intraclass correlation on each dimension, which included the following: (a) a global sensitivity scale that rated the mother's responses to the child's signals of emotional and physical needs (e.g., responds warmly to child bids and anticipates the physical and emotional needs of her child), (b) an intrusiveness scale that rated the degree to which the mother imposed her agenda on her child (e.g., physically restraining the child or dominating the interaction with unnecessary verbal direction), (c) a detachment scale that rated the mother's emotional involvement and degree of physical activity with the child (e.g., rarely making eye contact, verbal interaction, or responses to children's bids), (d) a positive regard scale that measured the mother's positive affect and delight in interacting with her child (e.g., warm vocal tone, physical affection, and smiling), (e) a negative regard scale that rated maternal expressions of negative affect and behaviors toward the child (e.g., disapproval, harsh physical manipulation, unexplained punishment), (f) an animation scale that rated the mother's enthusiasm for her child (e.g., enthusiastic vocal tone and facial animation), and (g) a stimulation of development scale that rated mother's cognitive stimulation of the child (e.g., labeling materials, encouraging verbalizations, and relating ongoing activities to beyond the current context). The validity of these dimensions is supported by work demonstrating their convergent validity with other measures of the home environment, such as the Home Observation for Measurement of the Environment (NICHD Early Child Care Research Network, 2006), as well as their predictive validity within socioeconomically and ethnically diverse samples (Blair et al., 2008; Garrett-Peters, Mills-Koonce, Vernon-Feagans, Willoughby, & Cox, 2008; Mills-Koonce et al., 2007) and specifically within African American subsamples (Propper, Willoughby, Halpern, Cox, & Carbone, 2007).

From the 12-month observations, composite variables were constructed from these scales on the basis of a principal factor analysis followed by a promax (oblique) rotation for identifying patterns of underlying structure. A scree test suggested only two meaningful factors. In interpreting the rotated factor pattern, an item was said to load on a given factor if the loading was .40 or greater for that factor and was less than .40 for any other factor. Using these criteria, five items loaded on the first factor and two items loaded on the second factor. An overall composite for sensitive parenting was created by summing the global sensitivity, detachment (reversed), positive regard, animation, and stimulation of develop-

ment dimensions (factor loadings were .94, .78, .84, .62, and .85, respectively). An overall composite for negative intrusive behavior was created by summing the intrusiveness and negative regard dimensions (factor loadings were .61 and .67, respectively). The intraclass correlations for the sensitivity and negative intrusive composites were .90 and .85, respectively. At 24 months, a confirmatory factor analysis obtained the same factors, and a sensitivity composite and a negative intrusive composite were thus created using the same dimensions at 24 months. The scores for the 12- and 24-month sensitive parenting composites were averaged to create the sensitive parenting score used in the current analyses, as were the 12- and 24-month scores for the negative intrusive behaviors.

Results

Preliminary Analyses

Table 1 provides the means, standard deviations, and ranges for each of the parenting factors, the Auditory Comprehension scores, and the Expressive Language scores for the two race groups. Table 2 provides the cross-time stability in auditory comprehension and in expressive communication, which ranged from moderate to high. The extent to which the parenting variables were related to one another was also examined; maternal sensitivity was negatively correlated with maternal negative intrusiveness ($r = -.58$, $p < .001$).

Table 1
Descriptive Statistics for Parenting Factors and Language Outcomes by Race

Variable	African American ($n = 73$)	European American ($n = 73$)
Sensitivity		
M	−0.25	0.25
SD	0.81	0.79
Range	−2.42–1.59	−1.82–1.53
Negative intrusive		
M	0.30	−0.34
SD	0.81	0.62
Range	−1.24–3.02	−1.67–1.27
Auditory comprehension		
18 months		
M	16.47	20.30
SD	2.93	4.58
Range	13–22	13–29
24 months		
M	22.30	27.16
SD	5.13	6.51
Range	13–33	13–41
30 months		
M	29.80	37.79
SD	8.01	8.90
Range	15–51	20–60
36 months		
M	38.71	46.99
SD	9.37	12.18
Range	15–66	15–75
Expressive communication		
18 months		
M	20.90	21.22
SD	2.50	2.53
Range	12–26	11–26
24 months		
M	24.17	26.00
SD	3.12	4.63
Range	15–35	15–41
30 months		
M	30.25	37.34
SD	5.92	7.36
Range	17–45	21–52
36 months		
M	37.78	43.91
SD	9.37	7.52
Range	20–55	26–63

Model Specification

Hierarchical linear models were estimated using the mixed procedure (i.e., proc mixed) in SAS software (Version 9.1) in order to examine changes in children's language development over four time points from 18 to 36 months. This procedure allowed for the control of the nonindependence of observations due to the same individuals being repeatedly assessed over time. A hierarchical linear model approach also accounts for missing-at-random outcome data, allowing the use of all available data for the outcome of interest (Little & Rubin, 1987; Raudenbush & Bryk, 2002). Restricted maximum likelihood was used in reporting model parameters, and degrees of freedom were estimated using the Satterthwaite method. Child's age was centered at the first measurement occasion, thus the intercept represented the outcome (auditory comprehension or expressive communication) at 18 months in all models. The linear slope parameter (child's age) represented the rate of change in auditory comprehension and expressive communication, and the quadratic slope parameter (child's age^2) represented a change in the rate of change (acceleration–deceleration). The extent to which the developmental pattern of auditory comprehension and expressive communication varied as a function of family SES, race, maternal sensitivity, and maternal negative intrusiveness was also examined (child sex was also added as a covariate in the models). Significant interactions were probed with procedures outlined by Aiken and West (1991).

Auditory Comprehension

To examine changes in auditory comprehension from 18 to 36 months, we evaluated both fixed and random age effects by estimating a series of unconditional growth models. In these growth models, we tested whether the overall trajectory of auditory comprehension was best characterized by linear or quadratic patterns of change and whether each coefficient should be treated as random or fixed. The final growth model for auditory comprehension included fixed linear and quadratic terms and a random intercept. We did not include random linear or quadratic slopes because of those terms being close to zero (thus inestimable) and because the recommendation has been to remove those terms from the model (Searle, Casella, & McCulloch, 1992).

Next, we evaluated the extent to which auditory comprehension varied as a function of SES, race, and mother–child interactions. Table 3 provides estimates and standard errors for the unconditional and final models predicting children's auditory comprehension skills over time. A significant main effect for race indicated that European American children's performance on auditory comprehension ($M = 20.35$) was somewhat higher than that of African

Table 2
Cross-Time Stability in Auditory Comprehension (Above the Diagonal) and Expressive Communication (Below the Diagonal)

Variable	1	2	3	4
1. 18 months	—	.68	.66	.63
2. 24 months	.50	—	.74	.77
3. 30 months	.39	.64	—	.83
4. 36 months	.39	.60	.85	—

Note. $N = 146$. All values are significant at $p < .001$.

American children ($M = 17.64$). The linear slope reflected positive linear change averaging 1.11 points per month; however, this effect was qualified by a significant quadratic effect and indicated that the rate of growth accelerated after 24 months. This pattern of growth did not differ by race.

Maternal sensitivity and negative intrusive parenting were also examined as predictors of changes in auditory comprehension. A significant Age × Sensitivity interaction indicated that children's growth in auditory comprehension occurred at a faster rate when their mothers were more sensitive (see Table 3). As pictured in Figure 1, children with high sensitivity mothers (1 standard deviation above the mean) had higher auditory comprehension scores and demonstrated a faster rate of growth over time than children with low sensitivity mothers (1 standard deviation below the mean). These effects did not differ by SES or race. Similar to maternal sensitivity, although there was no main effect for maternal negative intrusiveness, a significant Age × Negative Intrusiveness interaction emerged, indicating that as negative intrusiveness increased, the rate of growth decreased. As pictured in Figure 2, children with high negative intrusiveness mothers (1 standard deviation above the mean) had slower rates of growth over time than those with low negative intrusiveness mothers (1 standard deviation below the mean). This effect did not differ by SES or race.

The proportion of variance accounted for was calculated according to Snijders and Bosker (1999). The baseline for comparison was the unconditional growth model (Hox, 2002). The final model for auditory comprehension accounted for approximately 38% of the within-person (Level 1) variance and 48% of the between-person (Level 2) variance.

Expressive Communication

To examine changes in children's expressive communication from 18 to 36 months, we evaluated both fixed and random age effects by estimating a series of unconditional growth models. In these growth models, we tested whether the overall trajectory of expressive communication was best characterized by linear or quadratic patterns of change and whether each coefficient should be treated as random or fixed. The final growth model for expressive communication included fixed linear and quadratic terms and a random intercept. We did not include random linear or quadratic slopes because of those terms being close to zero (thus inestimable) and because the recommendation has been to remove those terms from the model (Searle et al., 1992).

Next, we evaluated the extent to which expressive communication varied as a function of SES, race, and mother–child interactions. Table 4 provides estimates and standard errors for the unconditional and final models predicting children's expressive communication skills over time. The intercept for expressive communication was 21.48, indicating that 18-month-old children scored 3 months higher than their age-expected scores. The linear slope for expressive communication reflected positive change averaging 0.55 points per month. However, this effect was qualified by a significant quadratic effect and indicated that the rate of growth accelerated. This effect was further qualified by a significant Quadratic × Race effect. As shown in Figure 3, although there was slower initial growth in expressive communication for African American children, the rate of change occurred at a faster rate for African American children. In addition, a significant effect for Age × SES (see Table 4) indicated that expressive communication occurred at a faster rate for children in high SES families (1 standard deviation above the mean) compared with children in low SES families (1 standard deviation below the mean; see Figure 4).

Maternal sensitivity and negative intrusive parenting were also significant predictors of expressive communication. A significant Sensitivity × Age effect indicated that children with high sensitivity mothers (1 standard deviation above the mean) demonstrated a faster rate of growth over time than children with low sensitivity mothers (1 standard deviation below the mean; see Figure 5). Finally, as shown in Table 4, although the main

Table 3
Unconditional and Final Hierarchical Linear Model (HLM) Results Predicting Children's Auditory Comprehension ($N = 146$)

	Unconditional growth model		Final HLM	
Variable	*B*	*SE*	*B*	*SE*
Intercept	18.03***	0.68	17.64***	0.90
Age (linear slope)	1.10***	0.12	1.11***	0.11
Age^2 (quadratic slope)	0.02**	0.01	0.02**	0.01
Sex			−2.65*	0.87
Race			2.71*	1.11
SES			0.74	0.40
Race × SES			−0.38	0.51
Age × Race			0.08	0.07
Age × SES			0.03	0.02
Age^2 × Race			−0.01	0.01
Sensitivity			0.12	1.03
Sensitivity × Race			0.98	1.38
Sensitivity × SES			0.19	0.34
Sensitivity × Age			0.17*	0.05
Negative intrusive			0.17	1.04
Negative Intrusive × Race			−1.59	1.66
Negative Intrusive × SES			0.26	0.41
Negative Intrusive × Age			−0.13*	0.05

	Unconditional growth model		Final HLM	
Variance component	Variance	*SE*	Variance	*SE*
Residual	24.84***	1.73	20.75***	1.46
Intercept	43.24***	5.84	20.10***	3.15

Note. SES = socioeconomic status.
* $p < .05$. ** $p < .01$. *** $p < .001$.

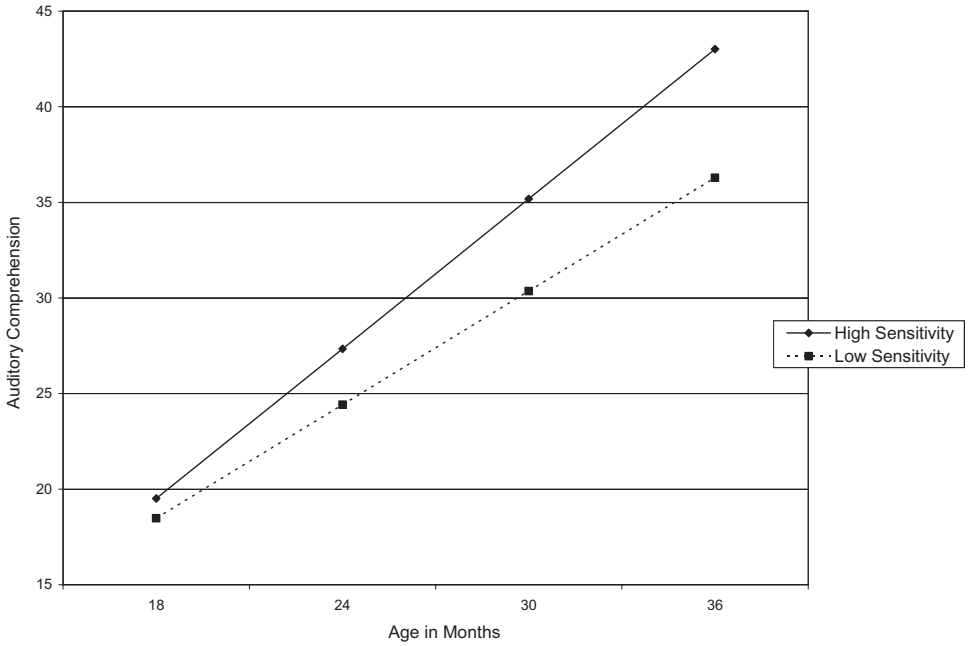

Figure 1. Auditory comprehension as a function of time and sensitivity.

effect for maternal negative intrusiveness was not significant, a significant three-way interaction emerged between age, negative intrusive parenting, and race. As shown in Figure 6, race moderated the association between negative intrusive parenting behaviors and children's growth in expressive language, such that this relation was stronger for European American children than for African American children. Follow-up comparisons indicated that the association with negative intrusive parenting was not significant for African American families. In contrast, the relation was significant for European American families, with the difference in expressive language between high (1 standard deviation above the mean) and low (1 standard deviation below the mean) negative intrusive parenting increasing over time.

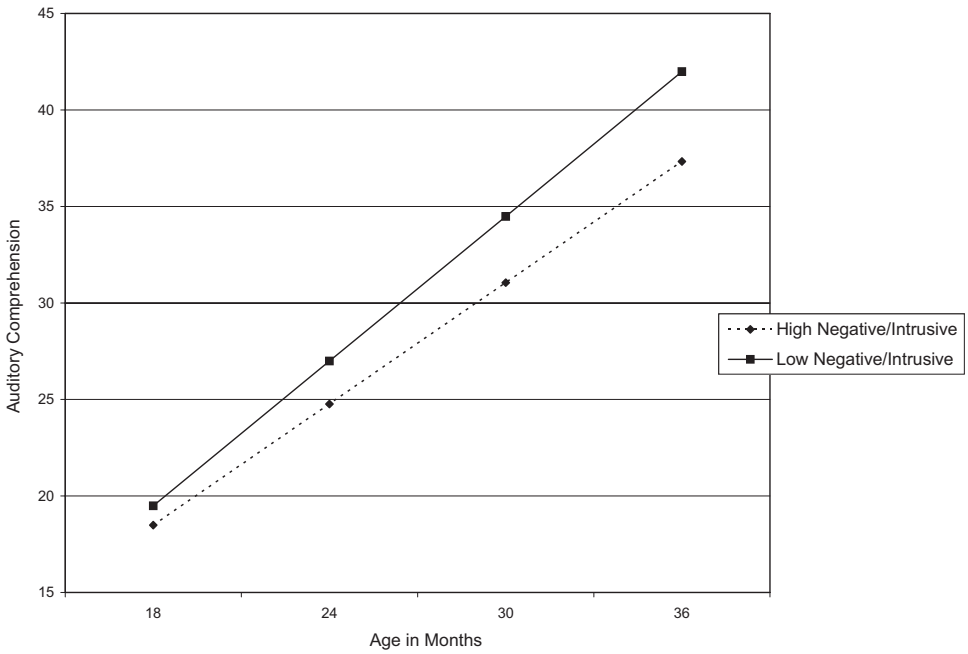

Figure 2. Auditory comprehension as a function of time and negative intrusiveness.

Table 4
Unconditional and Final Hierarchical Linear Model (HLM) Results Predicting Children's Expressive Communication (N = 146)

	Unconditional growth model		Final HLM	
Variable	*B*	*SE*	*B*	*SE*
Intercept	20.57***	0.50	21.48***	0.67
Age (linear slope)	0.78***	0.10	0.55***	0.11
Age^2 (quadratic slope)	0.02***	0.01	0.03***	0.01
Sex			−1.77*	0.62
Race			−0.57	0.88
SES			0.32	0.29
Race × SES			−0.35	0.36
Age × Race			0.61***	0.17
Age × SES			0.06***	0.01
Age^2 × Race			−0.02*	0.01
Sensitivity			0.29	0.74
Sensitivity × Race			0.12	0.98
Sensitivity × SES			0.16	0.25
Sensitivity × Age			0.14*	0.04
Negative intrusive			0.25	0.77
Negative Intrusive × Race			0.35	1.31
Negative Intrusive × SES			−0.01	0.29
Negative Intrusive × Age			−0.02	0.05
Negative Intrusive × Age × Race			−0.15*	0.07

	Unconditional growth model		Final HLM	
Variance component	Variance	*SE*	Variance	*SE*
Residual	18.26***	1.27	13.06***	0.92
Intercept	18.16***	2.68	9.36***	1.58

Note. SES = socioeconomic status.
* $p < .05$. *** $p < .001$.

The proportion of variance accounted for was calculated according to Snijders and Bosker (1999). The baseline for comparison was the unconditional growth model (Hox, 2002). The model for expressive communication accounted for approximately 40% of the within-person (Level 1) variance and 53% of the between-person (Level 2) variance.

Discussion

Our main goal was to examine the associations between SES (based on income and maternal education), race, and parenting and language development longitudinally in early childhood in a sample in which the typical confound between SES and race was reduced. SES, race, maternal sensitivity, and negative intrusiveness were significant predictors of language outcomes in young children. These findings add to the literature by examining the links between SES and race over time with both receptive and expressive abilities, by investigating the separate associations of maternal sensitivity and negative intrusive parenting with early language development, and by exploring the possible moderating effects of SES and race on the links between these parenting behaviors and language development. The pattern of results suggests that (a) race is associated with receptive language skills, (b) both SES and race are independently related to the growth of expressive skills, (c) both maternal sensitivity and negative intrusive parenting have unique links with language development, and (d) race moderates the relation between negative intrusive parenting and expressive language development.

The current findings demonstrate the association between SES and language skills. Children in lower SES families demonstrated a slower rate of growth for expressive language skills compared with children in higher SES families. This pattern is consistent with past studies that have assessed the relations of SES and income with young children's functioning and development, including language development (Duncan, Brooks-Gunn, & Klebanov, 1994; Hoff-Ginsberg, 1991; Linver et al., 2002; McLoyd, 1998). Parental proximal factors associated with low SES likely account for part of this association. Mistry et al. (2004) noted that perception of financial resource availability was related to maternal depression and less positive mother–child interactions, which, in turn, affected children's cognitive and language development. Hoff (2003) demonstrated that the differences in growth in vocabulary between higher SES and lower SES children (ages 16–31 months) was fully accounted for by maternal speech, with higher SES mothers speaking in longer utterances, using richer vocabulary, and producing more complex sentences than lower SES mothers. Additional qualitative and quantitative research is needed to identify other specific mechanisms associated with SES that have a direct influence on child language.

Race was also linked to language outcomes. African American children scored lower, on average, than European American children on receptive language skills, and African American children demonstrated a slower rate of growth than European American children for expressive skills. In addition, although African American children demonstrated slower initial growth in expressive communication, their rate of acceleration was faster than European American children; however, European American children remained higher than African American children. Several factors may account for these findings. First, cultural differences in the way children are spoken to may affect language skills. In a study investigating joint book-reading strategies, Anderson-Yockel and Haynes (1994) found that working-class African American mothers were less likely to ask questions that would elicit responses from their toddler and concluded that ". . .[Black] children are not seen as information givers or question-answerers. This is especially true of questions for which adults already have an answer" (p. 592). Thus, in comparison with European American mothers who are more likely to elicit answers from their child through yes–no and "what happened?" questions, African American mothers appear to be less likely to engage in the probing that could possibly enhance their children's expressive language. The present results raise the possibility that this association is not associated with SES per se but may reflect a broader cultural difference in parenting style.

The associations with race found here could also be related to racial discrimination and prejudice. Murry et al. (2001) investigated the moderating effect of racial discrimination on African American's psychological functioning and family relationships. They found that though the lack of income and resources was a significant factor in families' stress and functioning, "simply being Black in America" (Murry et al., 2001, p. 917) also played an important, but often unacknowledged, role in mother's anxiety and

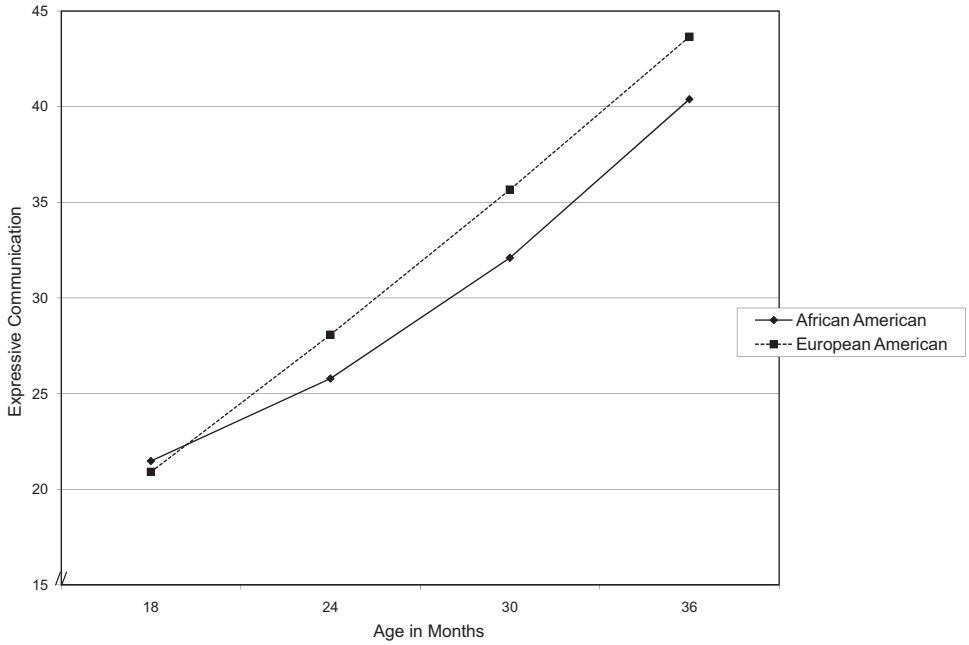

Figure 3. Expressive communication as a function of time and race.

depression levels, thus influencing the quality of the mother–child interaction and relationship.

In addition, the association with race found here could be related to other financial and resource variables not assessed. That is, although the confound between SES and race was reduced in this sample, the racial groups may still have differed in other resources and opportunities that could have influenced children's outcomes (McLoyd & Ceballo, 1998). Relatedly, marital status may have also played a role in the association between race and language outcomes found in this study. Even after reducing the confound between race and SES, marital status was associated with race such that African American children were less likely to be in homes with married or cohabitating parents compared with European American children. Prior work has demonstrated associations between marital status and young children's language outcomes, although the effects of marital status were found to be weaker than

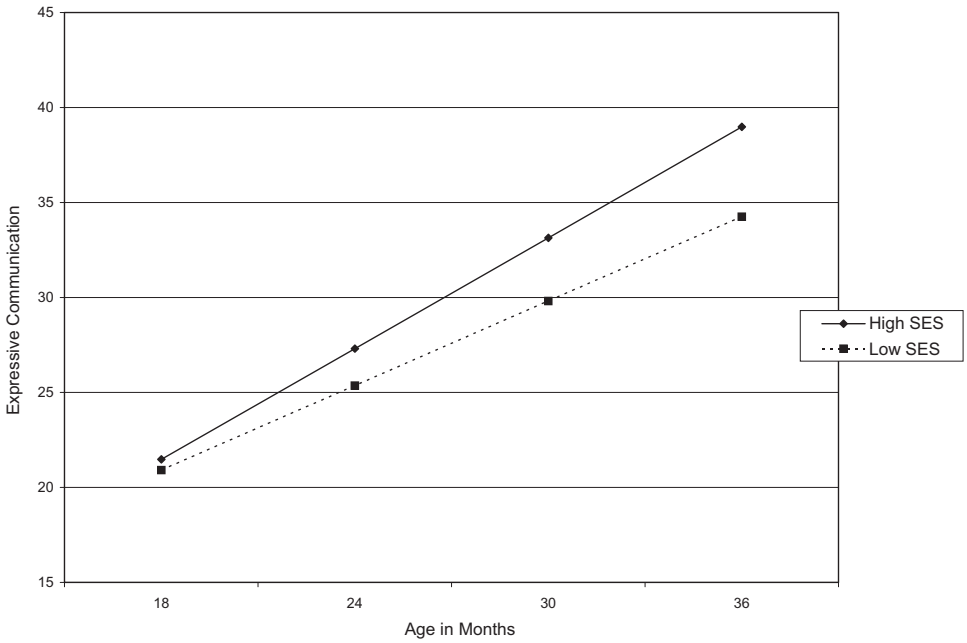

Figure 4. Expressive communication as a function of time and socioeconomic status (SES).

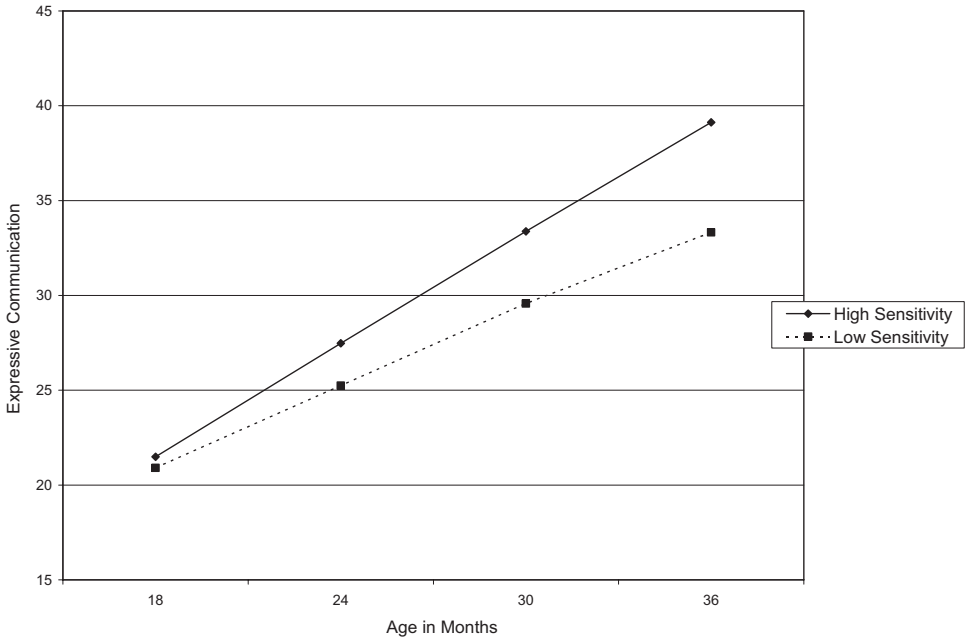

Figure 5. Expressive communication as a function of time and sensitivity.

those of maternal education (Qi, Kaiser, Milan, & Hancock, 2006). An important direction for future work is to examine how the association between marital status and race may contribute to the relation between race and children's language outcomes, investigating economic factors associated with marital status as well as the relation between family structure and the language environment experienced by the child.

Finally, it is also possible that the associations between race and language observed in this study were constrained by cultural aspects of the language assessment measure per se. African American children may, in general, have as their primary input a variety of language that is structurally different from European American children's, and the standardized measure used in this study may have reflected this difference as a deficit. That is, differences in language input may have also contributed to the language disparity between European American and African American children found in this study. Because standardized measures are based on Standard American English (SAE), children's usage of African American English (AAE) are discounted and penalized, possibly leading to lower language performances (Craig, Thompson, Washington, & Potter, 2004; Thompson, Craig, & Washington, 2004). The results found here may thus indicate that African American children use a variety of English that is different from SAE rather than reflecting a delay in language development. Indeed, Craig et al. (2004) found that when AAE vernacular was not scored as an error in a standardized reading test, African American elementary school children performed significantly better, but this increase was not educationally significant. Research is needed to determine how AAE influences children's early auditory comprehension and expressive language skills, given some evidence that children with dialect switching between AAE and SAE may be more cognizant of language structures and pragmatics (Connor & Craig, 2006). More broadly, future work should examine the variations in the language input children hear and use assessment procedures that account for variations of language that are structurally different from SAE, such as AAE, to further understand the differences found here. In contrast, given that SAE is the basis of all currently available standardized accountability measures, it is also important to examine how well African American children fare on these standardized assessments compared with their European American counterparts to inform the literature on the achievement gap.

Concerning parenting, the present results suggest that both maternal sensitivity and negative intrusive parenting are related to language outcomes. The notion that there are multiple independent and overlapping processes associated with environmental support for language development is consistent with previous studies that have found different effects of multiple parenting behaviors on multiple aspects of child language at multiple time points (e.g., Tamis-LeMonda et al., 2004). The finding that maternal sensitivity was linked to the growth of both receptive and expressive language abilities is consistent with previous literature examining cross-sectional effects of maternal sensitivity on children's language outcomes (e.g., Baumwell, Tamis-LeMonda, & Bornstein, 1997; Mistry et al., 2004). The present findings expand this literature by providing evidence that maternal sensitivity, regardless of race and SES, is positively associated with growth in both receptive and expressive language from 18 through 36 months of age, typically an age span of great change in the language domain.

Increased negative intrusive maternal behavior was associated with a slower rate of growth of receptive language, and the depressive effect of negative intrusive parenting on the growth of expressive language was moderated by race. Specifically, negative intrusiveness was linked to the growth of expressive language for children from European American families, suggesting that language development may be compromised if the caregiver does not support the autonomy and development of the child. European

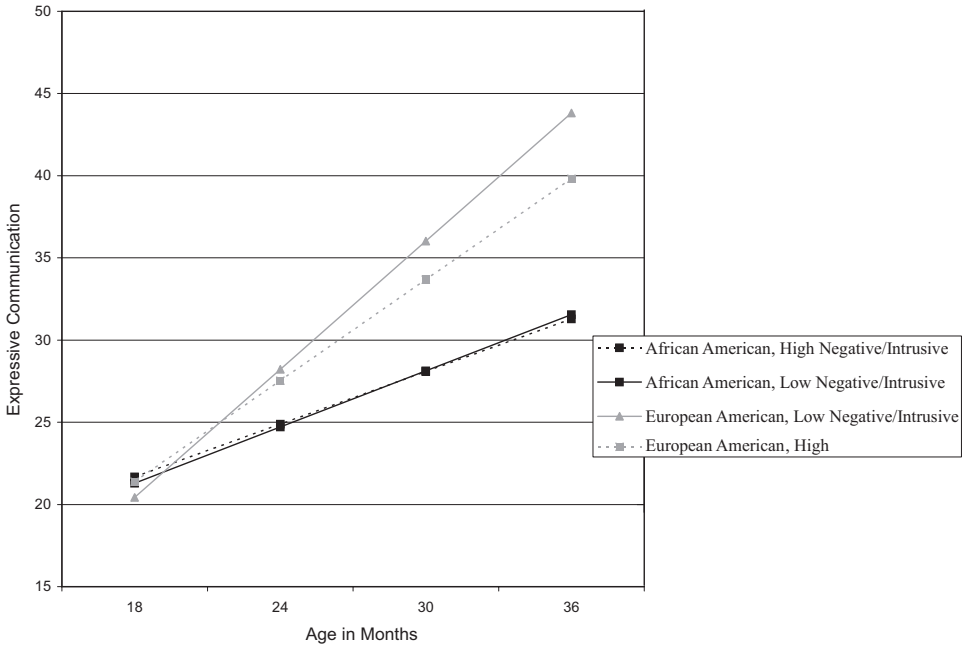

Figure 6. Expressive communication as a function of time, race, and negative intrusiveness.

American children with mothers that demonstrated high levels of negative intrusiveness demonstrated slower rates of growth than those whose mothers demonstrated low levels of negative intrusiveness. In contrast, negative intrusiveness did not appear to be related to the growth of expressive language skills for African American children. This finding is consistent with past research that has found a negligible, if not beneficial, impact of more highly controlling parenting for African American children, particularly in combination with parental warmth (Baldwin, Baldwin, & Cole, 1990; Brody & Flor, 1998; Ispa et al., 2004; McLoyd & Smith, 2002). Ispa et al. (2004) suggested that the minimal association between negative intrusive parenting and outcomes for African American children stems from the possibility that negative parenting may be buffered by other contextual or parenting factors for African American families. Also, these behaviors may not have the same meaning across cultural groups (Deater-Deckard & Dodge, 1997). Thus, the associations between parenting and the child's language development must be evaluated in the broader context in which the parenting behaviors occur.

The present study provides an unusual and important perspective on some associations with early language development. However, limitations in the study must be acknowledged. One set of limitations concerns the generalizability and breadth of the findings. To ensure that the SES distribution was similar between the racial groups and thus reduce the confound between SES and race, families at the extreme ends of the SES distribution were excluded from the analyses, limiting generalizations to families with very low or very high SES levels. Given the goal of examining the separate effects of SES and race, we are confident that the benefit gained from reducing this confound was worth the cost of focusing on a somewhat limited sample. It must be noted, though, that even in this reduced sample, race was not completely unrelated to variables that can influence SES. The two race groups differed in terms of maternal education (although the difference was not statistically significant) and marital status. Thus, although we reduced the confound between race and SES as compared with the strong correlation between these variables in most other studies conducted in the United States, our conclusions concerning SES and race need to be interpreted with some caution.

Also concerning generalizability, our model only predicted English language development and might not generalize to other languages. More significantly, we used a language assessment tool that tapped SAE and may have underestimated the language abilities of children who have been exposed to an environment rich in AAE. Further, our inability to test for the associations between maternal speech and language outcomes was a limitation of this study. Future work could assess maternal speech and use a measure more sensitive to dialectical variation to examine their effects on the relationships investigated in this study.

Another limitation concerns the fact that parenting was observed at only two time points and during semi-structured interactions in a laboratory setting. Given evidence suggesting that parental sensitivity can change over time (Hirsh-Pasek & Burchinal, 2006), future work could examine whether and how changes in parenting sensitivity and negative intrusiveness relate to language development and, specifically, whether aspects of parental style have different effects at different stages of language development. Also, examinations of parenting in more naturalistic settings with a wider range of parenting behaviors and styles of language input are necessary to validate the current findings, which were based on a more limited window of parenting observations. Finally, additional demographic and parenting factors that are likely to influence young children's language development should be included in subsequent research. For example, several studies have found that type and quality of child care is associated with children's cognitive and language outcomes (e.g., NICHD Early Child Care Re-

search Network, 2000; Peisner-Feinberg et al., 2001), and recent research suggests that father effects on children's early language outcomes may be independent of mother effects (Pancsofar & Vernon-Feagans, 2006).

Despite these limitations, our results suggest important directions for research on language development and for the implementation of intervention programs aimed at increasing the school readiness of children at high risk for poor academic outcomes. Concerning research on language development, our findings suggest that SES and race are uniquely related to children's language development. Given that these two factors are often confounded in research in this domain, care should be taken when results are interpreted. Our findings also suggest that sensitivity and negative intrusive parenting are not two sides of the same coin and that each variable has a unique link with language outcomes. Future work on parenting should investigate the unique associations between sensitivity and negative intrusive parenting on other developmental outcomes. Further, our data suggest that the associations between these parenting behaviors and child outcomes may vary by racial group, depending on the developmental outcome being examined. Future research needs to identify domains in which race may moderate the effects of parenting and, more importantly, the mechanisms responsible for these effects. Research is also needed to examine culturally relevant parenting practices that are particularly meaningful for at-risk children, such as supportive and strict parenting (i.e., no-nonsense parenting; see Brody & Flor, 1998). Further, our study focused on complexities of the environment early in childhood and did not examine individual differences among children that may make language learning easier for some children compared with others (e.g., phoneme perception, working memory capacity). Future research could test more nuanced models by including perceptual and cognitive variables to assess individual differences in children's language learning potential and examine how these factors may interact with maternal sensitivity and negative intrusive parenting.

Concerning the implementation of intervention programs, in addition to providing children with language-rich activities and materials to help combat the effects of poverty, parent-focused programs that increase sensitivity may further improve children's language development. Further, parenting interventions should focus on culturally relevant practices that would benefit children's development. More research is needed concerning the factors that contribute to the associations with race found here to make more specific programmatic recommendations; however, intervention programs that are sensitive to the cultural context in which children are raised may be more successful in reducing the effects of demographic risk factors on children's development and possibly help to reduce the achievement gap.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Thousand Oaks, CA: Sage.

Anderson-Yockel, J., & Haynes, W. O. (1994). Joint book-reading strategies in working-class African American and White mother–toddler dyads. *Journal of Speech and Hearing Research, 37,* 583–593.

Baldwin, A. L., Baldwin, C., & Cole, R. E. (1990). Stress-resistant families and stress-resistant children. In J. Rolf, A. S. Masten, D. Cicchetti, K. Neuchterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 257–280). Cambridge, England: Cambridge University Press.

Baumrind, D. (1972). An exploratory study of socialization effects of Black children: Some Black–White comparison. *Child Development, 43,* 261–267.

Baumwell, L., Tamis-LeMonda, C. S., & Bornstein, M. H. (1997). Maternal verbal sensitivity and child language comprehension. *Infant Behavior and Development, 20,* 247–258.

Birch, S. H., & Ladd, G. W. (1996). Interpersonal relationships in the school environment and children's early school adjustment. In K. Wentzel & J. Juvonen (Eds.), *Social motivation: Understanding children's school adjustment* (pp. 199–225). New York: Cambridge University Press.

Blair, C., Granger, D., Kivlighan, K., Mills-Koonce, W. R., Willoughby, M., Greenberg, M. T., et al. (2008). Maternal and child contributions to cortisol response to emotional arousal in young children from low-income, rural communities. *Developmental Psychology, 44,* 1095–1109.

Brody, G. H., & Flor, D. L. (1998). Maternal resources, parenting practices, and children competence in rural single-parent African American families. *Child Development, 69,* 803–816.

Bugental, D. B., & Grusec, J. E. (2006). Socialization processes. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (6th ed., Vol. 3, pp. 366–428). Hoboken, NJ: Wiley.

Burchinal, M. R., Campbell, F. A., Bryant, D. M., Wasik, B. H., & Ramey, C. T. (1997). Early intervention and mediating processes in cognitive performance of children of low-income, African-American families. *Child Development, 68,* 935–954.

Connor, C. M., & Craig, H. K. (2006). African American preschoolers' language, emergent literacy skills, and use of African American English: A complex relation. *Journal of Speech, Language, and Hearing Research, 49,* 771–792.

Craig, H. K., Connor, C. M., & Washington, J. A. (2003). Early positive predictors of later reading comprehension for African American students: A preliminary investigation. *Language, Speech, and Hearing Services in Schools, 34,* 31–43.

Craig, H. K., Thompson, C. A., Washington, J. A., & Potter, S. L. (2004). Performance of elementary-grade African American students on the Gray Oral Reading Tests. *Language, Speech, and Hearing Services in Schools, 35,* 141–154.

Culp, A., Hubbs-Tait, L., Cuilp, R., & Starost, H. (2001). Maternal parenting characteristics and school involvement: Predictors of kindergarten cognitive competence among Head Start children. *Journal of Research in Childhood Education, 15,* 5–17.

Dearing, E., McCartney, K., & Taylor, B. A. (2001). Change in family income-to needs matters more for children with less. *Child Development, 72,* 1779–1793.

Deater-Deckard, K., & Dodge, K. A. (1997). Externalizing behavior problems and discipline revisited: Nonlinear effects and variations by culture, context, and gender. *Psychological Inquiry, 8,* 161–175.

Denavas-Walt, C., Proctor, B. D., & Lee, C. H. (2006). *Income, poverty, and health insurance coverage in the United States*. Washington, DC: U.S. Census Bureau, U.S. Government Printing Office.

Dodici, J., Draper, D. C., & Peterson, C. A. (2003). Early parent–child interaction and early literacy development. *Topics in Early Childhood Special Education, 23,* 124–136.

Dornbusch, S. M., Ritter, P. L., Leiderman, P. H., Roberts, D. F., & Fraleigh, M. J. (1987). The relation of parenting style to adolescent performance. *Child Development, 58,* 1244–1257.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, J. K. (1994). Economic deprivation and early childhood development. *Child Development, 65,* 296–318.

Egeland, B., & Heister, M. (1995). The long-term consequences of infant day-care and mother–infant attachment. *Child Development, 66,* 474–485.

Egeland, B., Pianta, R., & O'Brien, M. A. (1993). Maternal intrusiveness in infancy and child maladaptation in early school years. *Development and Psychopathology, 5,* 359–370.

Elardo, R., Bradley, R., & Caldwell, B. M. (1977). A longitudinal study of the relation of infants' home environment to language development at age three. *Child Development, 48,* 595–603.

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist, 59,* 77–92.

Garcia Coll, C. T. (1990). Developmental outcome of minority infants: A process-oriented look into our beginnings. *Child Development, 61,* 270–289.

Garcia Coll, C. T., Lamberty, G., Jenkins, R., McAdoo, H. P., Crnic, K., Wasik, B. H., & Garcia, H. V. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development, 67,* 1891–1914.

Garrett-Peters, P., Mills-Koonce, W. R., Vernon-Feagans, L., Willoughby, M. W., & Cox, M. J. (2008). Predictors of parental emotion language in infancy. *Parenting: Science and Practice, 8,* 117–152.

Hart, B., & Risley, T. R. (1992). American parenting of language-learning children: Persisting differences in family–child interaction observed in natural home environments. *Developmental Psychology, 28,* 1096–1105.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experiences of young American children.* Baltimore, MD: Paul H. Brookes.

Heller, T., & Baker, B. (2000). Maternal negativity in children's externalizing behavior. *Early Education and Development, 11,* 483–498.

Hirsh-Pasek, K., & Burchinal, M. (2006). Putting language learning in context: How changes at home and in school affect language growth across time. *Merrill-Palmer Quarterly, 52,* 449–485.

Hoff, E. (2003). The specificity of environment influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development, 74,* 1368–1378.

Hoff-Ginsberg, E. (1991). Mother–child conversation in different social classes and communicative settings. *Child Development, 62,* 782–796.

Hox, J. (2002). *Multilevel analysis: Techniques and applications*. Mahwah, NJ: Erlbaum.

Ispa, J. M., Fine, M. A., Halgunseth, L. C., Harper, S., Robinson, J., Boyce, L., et al. (2004). Maternal intrusiveness, maternal warmth, and mother–toddler relationship outcomes: Variation across low-income ethnic acculturation groups. *Child Development, 75,* 1613–1631.

Johnson, D. L. (2001). The influences of social class and race on language test performance and spontaneous speech of preschool children. *Child Development, 45,* 517–521.

Keown, L., Woodward, L., & Field, J. (2001). Language development of pre-school children born to teenage mothers. *Infant and Child Development, 10*(3)*,* 129–145.

Lawrence, V. W. (1997). Middle- and working-class Black and White children's speech during a picture-labeling task. *The Journal of Genetic Psychology, 158,* 226–240.

Linver, M. R., Brooks-Gunn, J., & Kohen, D. E. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology, 38,* 719–734.

Little, R. A. A., & Rubin, D. B. (1987). *Statistical analysis with missing data.* New York: Wiley.

Magnuson, K. A., & Duncan, G. J. (2006). The role of family socioeconomic resources in the Black–White test score gap among young children. *Developmental Review, 26,* 365–399.

McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American Psychologist, 53,* 185–204.

McLoyd, V. C., & Ceballo, R. (1998). Conceptualizing and assessing economic context: Issues in the study of race and child development. In V. C. McLoyd & L. Steinberg (Eds.), *Studying minority adolescents: Conceptual, methodological, and theoretical issues* (pp. 251–278). Mahwah, NJ: Erlbaum.

McLoyd, V. C., & Smith, J. (2002). Physical discipline and behavior problems in African American, European American, and Hispanic children: Emotional support as a moderator. *Journal of Marriage and the Family, 64,* 40–53.

Mills-Koonce, W. R., Propper, C., Gariépy, J. L., Blair, C., Garrett-Peters, P., & Cox, M. J. (2007). Bi-directional genetic and environmental influence on mother and child behavior: The family system as the unity of analyses. *Development and Psychopathology, 19,* 1073–1087.

Mistry, R. S., Biesanz, J. C., Taylor, L. C., Burchinal, M., & Cox, M. J. (2004). Family income and its relation to preschool children's adjustment for families in the NICHD Study of Early Child Care. *Developmental Psychology, 40,* 717–745.

Mistry, R. S., Melsch, A., & Taheri-Kenaru, A. (2003, September). *Assessing the relations among maternal employment, family processes, and preschoolers' cognitive and social adjustment for families in the Comprehensive Child Development Program (CCDP).* Paper presented at Northwestern University/University of Chicago Joint Center for Poverty Research HHS-ASPE/Census Bureau Research Development Grants Conference, Chicago.

Murry, V. M., Brown, P. A., Brody, G. H., Cutrona, C. E., & Simons, R. L. (2001). Racial discrimination as a moderator of the links among stress, maternal psychological functioning and family relationships. *Journal of Marriage and the Family, 63,* 915–926.

National Institute of Child Health and Human Development Early Child Care Research Network. (1997). The effects of infant child care on infant–mother attachment securing: Results of the NICHD Study of Early Child Care. *Child Development, 68,* 860–879.

National Institute of Child Health and Human Development Early Child Care Research Network. (2000). The relation of child care to cognitive and language development. *Child Development, 71,* 960–980.

National Institute of Child Health and Human Development Early Child Care Research Network. (2005). Pathways to reading: The role of language in the transition to reading. *Developmental Psychology, 41,* 428–442.

National Institute of Child Health and Human Development Early Child Care Research Network. (2006). Infant–mother attachment: Risk and protection in relation to changing maternal caregiving quality over time. *Developmental Psychology, 42,* 38–58.

O'Neill, D. K., Pearce, M. J., & Pick, J. L. (2004). Preschool children's narratives and performance on the Peabody Individualized Achievement Test–Revised: Evidence of a relation between early narrative and later mathematical ability. *First Language, 24,* 149–183.

Pancsofar, N., & Vernon-Feagans, L. (2006). Mother and father language input to young children: Contributions to later language development. *Journal of Applied Developmental Psychology, 27,* 571–587.

Parke, R. D., & Buriel, R. (2006). Socialization in the family: Ethnic and ecological perspectives. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (6th ed., Vol. 3, pp. 429–504). Hoboken, NJ: Wiley.

Peisner-Feinberg, E., Burchinal, M., Clifford, R., Culkin, M., Howes, C., Kagan, S., & Yazejian, N. (2001). The relation of preschool child-care quality to children's cognitive and social developmental trajectories through second grade. *Child Development, 72,* 1534–1553.

Pianta, R. C. (1997). Adult–child relationship processes and early schooling. *Early Education and Development, 81,* 11–26.

Pianta, R. C., Nimetz, S. L., & Bennett, E. (1997). Mother–child relationships, teacher–child relationships, and school outcomes in preschool and kindergarten. *Early Childhood Research Quarterly, 12,* 263–280.

Pianta, R. C., & Walsh, D. (1996). *High-risk children in the schools: Creating sustaining relationships.* New York: Routledge.

Prelow, H. M., Danoff-Burg, S., Swenson, R. R., & Pugliano, D. (2004). The impact of ecological risk and perceived discrimination on the psychological adjustment of African American and European American youth. *Journal of Community Psychology, 32,* 375–389.

Propper, C., Willoughby, M., Halpern, C. T., Cox, M., & Carbone, M. A. (2007). Parenting quality, DRD4, and the prediction of externalizing and internalizing behaviors in early childhood. *Developmental Psychobiology, 49,* 619–632.

Qi, C. H., Kaiser, A. P., Milan, S., & Hancock, T. (2006). Language performance of low-income African American children and European American children on the PPVT-III. *Language, Speech, and Hearing Services in Schools, 37,* 5–16.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models.* Thousand Oaks, CA: Sage.

Raviv, T., Kessenich, M., & Morrison, F. J. (2004). A mediational model of the association between socioeconomic status and three-year-old language abilities: The role of parenting factors. *Early Childhood Research Quarterly, 19,* 528–547.

Rubin, K., Burgess, K., Sawyer, K., & Hastings, P. (2003). Predicting preschoolers' externalizing behaviors from toddler temperament, conflict, and maternal negativity. *Developmental Psychology, 39,* 164–176.

Scarborough, A. A. (2001). Behavioral patterns of toddlers with speech language delay: The relationship with child, family, and poverty (Doctoral dissertation, University of North Carolina at Chapel Hill, 2001). *Dissertation Abstracts International, 61,* 4339.

Searle, S. R., Casella, G., & McCulloch, C. E. (1992). *Variance components.* New York: Wiley.

Shaw, D. S., Winslow, E. B., Owens, E. B., Vondra, J. I., Cohn, J. E., & Bell, R. Q. (1998). The development of early externalizing problems among children from low-income families: A transformational perspective. *Journal of Abnormal Child Psychology, 26,* 95–107.

Siegel, L. S. (1982). Reproductive, perinatal, and environmental factors as predictors of the cognitive and language development of preterm and full-term infants. *Child Development, 53,* 963–973.

Skiba, R. J., Poloni-Staudinger, L., Simmons, A. B., Feggins-Azziz, L. R., & Chung, C. (2005). Unproven links: Can poverty explain ethnic disproportionality in special education. *The Journal of Special Education, 39,* 130–144.

Snijders, T., & Bosker, R. (1999). *Multilevel analysis.* London: Sage.

Stevenson, H. W., & Newman, R. S. (1986). Long-term prediction of achievement and attitudes in mathematics and reading. *Child Development, 57,* 646–659.

Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from longitudinal structural model. *Developmental Psychology, 38,* 934–947.

Tamis-LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal responsiveness and children's achievement of language milestones. *Child Development, 72,* 748–767.

Tamis-LeMonda, C. S., Shannon, J. D., Cabrera, N. J., & Lamb, M. E. (2004). Fathers and mothers at play with their 2- and 3-year olds: Contributions to language and cognitive development. *Child Development, 75,* 1806–1820.

Thompson, C. A., Craig, H. K., & Washington, J. A. (2004). Variable production of African American English across oracy and literacy contexts. *Language, Speech, and Hearing Services in Schools, 35,* 269–282.

Walker, D., Greenwood, C., Hart, B., & Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development, 65,* 606–621.

Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2002). *The Preschool Language Scale: Fourth Edition, examiner's manual.* San Antonio, TX: The Psychological Corporation.

Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2004). *The Preschool Language Scale: Fourth Edition.* San Antonio, TX: The Psychological Corporation.

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