Academic implications of insensitive parenting: A mediating path through children's relational representations

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ABSTRACT

Despite evidence that insensitive parenting is associated with later academic achievement, few studies have evaluated mechanisms that may account for these effects. This study utilized a diverse sample of child-caregiver dyads (N = 245, 50.2% male, 46.5% Latinx) to evaluate a sequential mediation model from observations of female caregivers' insensitive parenting behaviors at age 4 to children's maternal representations at age 6, to teachers' reports of conflict in the teacher-child relationship at age 7 and, ultimately, to children's academic achievement at age 8. Even when holding prior levels of each study construct constant, analyses revealed a significant sequential mediation such that insensitive parenting contributed to increases in children's harsh maternal representations, which, in turn, predicted increases in teacher-child conflict at school and, ultimately, decreases in children's reading and math achievement. These findings highlight parenting and teacher-child relationship qualities as promising targets for interventions to promote children's academic achievement.

Introduction

Children's academic achievement is a central concern for parents, educators, researchers and policymakers. Despite concerted efforts to understand and promote children's educational success, however, average achievement scores among the Nation's fourth graders have plateaued below a "proficient" level (National Assessment of Educational Progress, 2017). Legislative efforts to promote student learning outcomes, such as No Child Left Behind (2002) and its successor, Every Student Succeeds (2015), have yielded mixed results with some studies finding no improvements in reading or math (Lee & Orfield, 2006), and others showing modest improvements in math, but not in reading (Dee & Jacob, 2011). Therefore, the current investigation sought to elucidate potentially modifiable and heretofore under-appreciated influences on children's school success by testing a sequential mediation model wherein insensitive parenting practices during the preschool years were expected to hinder children's later academic achievement by undermining their internalized beliefs and expectations about the caregiving relationship and, by extension, the quality of children's relationships with teachers in the elementary school setting.

Guided by the tenets of attachment and organizational theories of development (Bowlby, 1958; Sroufe, 1990), this study focused on children's transition to formal schooling as a period of heightened sensitivity to parental influences on early learning, and of significance for initiating pathways to later academic achievement and educational attainment. Attachment theory holds that caregiving quality influences children's relational beliefs and expectations (i.e., representations), which are expressed behaviorally in early development, but become internalized as information processing heuristics that guide children's behavior in new relationships during the preschool period (Bowlby, 1969/1982; Bretherton, Ridgeway, & Cassidy, 1993; Main, Kaplan, & Cassidy,1985; Sroufe, Egeland, & Carlson, 1999). In this way, children's relational representations may influence the quality of teacher-child relationships and, ultimately, academic achievement. Given the robust impact of teacher-child relationship quality on children's achievement (Cadima, Verschueren, Leal, & Guedes, 2016; Collins, O'Connor, Supplee, & Shaw, 2017; Hartz, Williford, & Koomen, 2017), as well as on children's reputation in the school (and with future teachers) more generally (Jerome, Hamre, & Pianta, 2009), early caregiving experiences may initiate relational and educational pathways that become increasingly entrenched over time (Maldonado-Carreño & Votruba-Drzal, 2011; Yeo & Clarke, 2006).

Parenting and children's academic achievement

Although multiple systems across many levels of influence impact children's academic achievement (e.g., economic factors, Jones, Wilson,

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Clark, & Dunham, 2018); curricular factors, Maxwell, Reynolds, Lee, Subasic, & Bromhead, 2017), research consistently points to the promotive influence of parental school involvement, such as participating in parent-teacher conferences, providing homework assistance, and attending school functions, on children's academic achievement (Fan & Chen, 2001; Jeynes, 2003; Wilder, 2014). That said, a recent meta-analysis of studies examining parental involvement and academic achievement by Castro et al. (2015) revealed an important, yet often overlooked, distinction between the quality and quantity of parental involvement. For example, in a recent study of sixth graders, children who self-reported more supportive, as opposed to intrusive, parental involvement also earned significantly higher reading and language achievement scores (Moroni, Dumont, Trautwein, Niggli, & Baeriswyl, 2015). However, in this same sample, the quantity of parental involvement (i.e., higher frequency of homework help) was negatively related to achievement.

In light of these findings, researchers seeking to promote children's early learning and achievement have begun to shift their focus from the quantity of parents' school involvement toward the overall quality or sensitivity of parents' non-academic parenting behaviors. For example, although the majority of extant research on parenting and child achievement has emphasized the quantity of parental reading activities and school involvement (Goldfield & Snow, 1984; Justice & Kaderavek, 2002; Lonigan, Anthony, Bloomfield, Dyer, & Samwel, 1999), a growing number of studies have considered the implications of parents' sensitive and supportive caregiving beyond school-specific settings for understanding children's educational success (e.g., Vasquez, Patall, Fong, Corrigan, & Pine, 2016). Indeed, building on attachment studies demonstrating that sensitive and responsive parenting supports healthy emotional development in early childhood (Ainsworth, 1969; Sroufe, 1983), researchers have documented clear and convincing relations between early caregiving sensitivity (e.g., exchanges characterized by high warmth and support, and low intrusiveness and hostility) and young children's adjustment in preschool (Bono, Sy, & Kopp, 2016; Bornstein et al., 2020; Harmeyer, Ispa, Palermo, & Carlo, 2016; Zvara, Keim, Boone, & Anderson, 2019). Extending beyond the preschool period, some data point to significant relations between insensitive parenting and children's compromised academic achievement (Monti, Pomerantz, & Roisman, 2014), but there is a need for further research, particularly to evaluate theoretically-specified mechanisms thought to underlie such relations.

Insensitive parenting is a broad construct that encompasses varied practices characterized by low support, high intrusiveness and/or hostility (Baker, 2018; Thijssen et al., 2017). Supportive parenting practices fall on a continuum, such that a supportive parent engages in positive behaviors that establish the parent as a secure base and as a source of positive regard and emotional support for the child (e.g., providing age-appropriate guidance and praise), whereas a parent who evidences low support for the child may be passive, detached, unavailable, or unwilling to meet the child's needs for security and support (Gunderson et al., 2018; Mesman & Emmen, 2013; Raby et al., 2015). Intrusive parenting is characterized by the presence of verbal and/or physical behaviors that undermine the child's autonomy, such as when the parent takes over a task that the child is capable of doing independently (Wood, 2006). Finally, hostile parenting occurs when a parent engages in behavioral displays of anger, ridicule, or rejection toward the child (Rhoades et al., 2012). Individually and in tandem, insensitive parenting practices characterized by low support (e.g., Bindman, Pomerantz, & Roisman, 2015), high intrusiveness (e.g., Wong, Zhuang, & Ng, 2019), and/or hostility (e.g., Lam, Chung, & Li, 2018) have been linked with negative learning outcomes, though comparatively fewer studies have evaluated mechanisms underlying these effects.

Parenting and children's academic achievement: mediating mechanisms

Relative to the extensive literature on parenting and child adaptation (Pinquart & Gerke, 2019), and despite extensive theory addressing parenting effects in development (Ainsworth, 1969; Baumrind, 1991; Belsky, 1984), few studies have evaluated theoretically-specified mediators of predicted parenting effects on children's academic achievement. Prior research on motivational mediating mechanisms points to children's desire to gain their parents' approval (Cheung & Pomerantz, 2012), student attitudes and behaviors (e.g., truancy; McNeal, 2014), and student engagement and perseverance (Waters, Loton, & Jach, 2019) as important mechanisms underlying relations between parenting quality and children's academic achievement. However, attachment theory illuminates an additional pathway from parenting to achievement via children's relational representations.

According to attachment theory, early caregiving experiences shape children's expectations of others, the self, and the self-in-relation to others (Bowlby, 1969/1982; Bretherton et al., 1993; Main et al.,1985; Kobak & Sceery, 1988; Sroufe, Carlson, Levy, & Egeland, 1999). In turn, these representations function as information processing heuristics or models that guide children's interpersonal relationships within and beyond the family milieu (Bowlby, 1969/1982; Bretherton et al., 1993; Main et al., 1985). If the primary caregiver functions as a secure base and provides a safe haven for the child, the child will develop generally positive relational representations wherein the parent is viewed as trustworthy and caring. In contrast, insensitive parental behaviors characterized by low support, high intrusiveness, and/or hostility can lead children to form a negative representation of the parent as unreliable and/or threatening. Over time, children may generalize from negative representations of the parent figure to other adult figures, including classroom teachers. Thus, although children's representations of their primary caregiver may not impact academic achievement directly, they are expected to influence other processes (e.g., the quality of the child's relationship with teachers) that, in turn, affect academic achievement.

A robust literature connects sensitive parenting to secure attachment (Karavasilis, Doyle, & Markiewicz, 2003; van der Voort, Juffer, & Bakermans-Kranenburg, 2014), and, by extension, to positive caregiver representations (e.g., Main et al., 1985; Steele, Hodges, Kaniuk, & Steele, 2009). Moreover, extant theory and research demonstrate that young children's attachment and caregiver representations carry over to relationships with other adults (Page & Bretheron, 2001; Sroufe et al., 1999; Vu, 2015). Indeed, prior research has shown that children's representations of their caregivers are associated with, and even predictive of, the quality of their relationships with teachers (O'Connor & McCartney, 2006). For example, compared to children who conveyed secure representations of their caregivers as responsive and supportive in a narrative task at age five, children who conveyed avoidant representations characterized by caregiver indifference and unavailability experienced more conflict and less closeness with their teacher at age six (Rydell, Bohlin, & Thorell, 2005).

The influence of teacher-child relationship qualities on later child outcomes has been well-characterized in prior studies of teacher-child conflict and closeness (Cadima et al., 2016; Collins et al., 2017; Hartz et al., 2017; Heatly & Votruba-Drzal, 2017; Pianta, Steinberg, & Rollins, 1995). A sizeable portion of this literature focuses on child behavioral outcomes and ultimately suggests that higher levels of teacher-child conflict and/or lower levels of closeness are related to increases in internalizing and externalizing behavior problems (e.g., Collins et al., 2017; Whittaker & Harden, 2010). In contrast, the literature examining academic outcomes is less consistent with evidence that (1) both teacher-child conflict and closeness predict academic achievement (e.g., Pianta & Stuhlman, 2004), (2) teacher-child closeness, but not conflict, relates to achievement (e.g., Valiente, Parker, Swanson, Bradley, & Groh, 2019), and (3) teacher-child conflict, but not closeness, predicts children's academic achievement (e.g., Varghese, Vernon-Feagans, &

Bratsch-Hines, 2019). Despite these inconsistencies, several longitudinal studies suggest that teacher-child conflict is especially salient for children's academic achievement, even after controlling for other factors, such as prior teacher-child relationship quality and academic achievement (McCormick, O'Connor, Cappella, & McClowry, 2013; Mercer & DeRosier, 2008).

The current study

The current study drew on a large and diverse sample of children to evaluate hypothesized relations between (a) observations of female caregivers' insensitive parenting behaviors (i.e., low support, high intrusiveness, high hostility) during a series of video-recorded teaching tasks at age 4 and changes in children's maternal representations from ages 4 to 6, (b) children's maternal representations at age 6 and changes in teachers' reports of conflict in the teacher-child relationship from ages 6 to 7, and (c) teacher-child conflict at age 7 and changes in children's academic achievement in reading and math from ages 6 to 8. We hypothesized that children's relational representations of their primary caregiver would account for expected relations between insensitive parenting and poor academic outcomes in reading and math because they influence the quality of the teacher-child relationship. We focused on reading and math achievement because these domains are widely recognized as core areas of academic emphasis during the elementary school years, and they have significant and enduring implications for educational achievement in and beyond these domains (e.g., science and foreign language learning) in later school years (Ehm, Lindberg, & Hasselhorn, 2014). To support directional inferences, all analyses controlled for children's prior maternal representations, prior conflict in the teacher-child relationship, and prior academic achievement. In addition, covariates with documented relations to children's academic achievement were held constant, including child gender (Endendijk, Groeneveld, Bakermans-Kranenburg, & Mesman, 2016), child ethnicity-race (Battle & Lewis, 2002), family socioeconomic status (SES; Sirin, 2005), and child intelligence (Gagné & St Père, 2001).

Method

Participants

The sample was drawn from an ongoing, longitudinal study of development among 250 caregiver-child dyads. The current analyses were based on a subsample of 245 dyads; five dyads were excluded due to caregiver changes between the time of the parenting observation at age 4 and the follow-up assessment of the child's maternal representation at age 6. The current participants were diverse with regard to child gender (50.2% male) and ethnicity-race (46.5% Latinx, 17.6% Black/African American, 11% white/European, 0.4% Asian, and 24.4% multiracial). Primary caregivers were mostly biological mothers (91.8%), followed by foster/adoptive mothers (5%), and grandmothers or other female kin caregivers (3.2%). Considering all caregivers were female and 96.8% were mothers, we refer to all caregivers as "mothers" henceforth. Maternal education levels varied with 19.6% having not completed high school, 16.3% having a high school degree or equivalent, and 42.4% having some kind of technical training or college coursework. Over half (55.0%) the mothers were employed, and most were married (60.4%) or in a committed relationship (19.6%). More than half (60.5%) the families had the biological father in residence, and an additional 19.6% had another male caregiver in residence (e.g., stepfather, live-in partner). The average number of dependent children (i.e., under the age of 18) in the home was 2.47 ($SD = 1.1$), and the average annual household income was $37,760.1 ($SD = $24,835.1). The sample was representative of the broader southern California community from which it was recruited with regard to ethnicity-race and economic status (U.S. Census Bureau, 2019).

Procedure

Families were recruited via flyers advertising a "study of children's learning and development," which were distributed to a variety of community-based organizations and preschool programs serving children and families in Southern California. Mothers completed a brief screening by phone to ensure the target child was 1) between 3.9 and 4.6 years of age, 2) proficient in English, and 3) not diagnosed with a developmental disability. The current study utilized assessments across four data waves at ages 4 ($N = 245$), 6 ($N = 209$), 7 ($N = 192$), and 8 ($N = 203$). Across waves, 227 children (92.7%) completed one or more follow-up assessments at ages 6, 7, and/or 8.

At each wave, dyads completed a three-hour laboratory assessment, which consisted of measures with the child, the mother, and the mother and child interacting. Following the laboratory assessment, surveys were mailed to the child's primary teacher. Teacher surveys were sent at least one month after the child began school to ensure the teacher had enough time to get to know the child prior to completing the survey. Mothers received $25 per each hour of assessment, children received a gift at the end of each assessment, and teachers received a gift card valued at $20 upon return of their survey packets in the mail. Informed consent was obtained from the child's legal guardian at all waves and informed assent was collected from children beginning at age 7. All procedures were approved by the human research review board of the participating university.

Measures

Insensitive parenting

At age 4, each mother was video recorded interacting with her child during a series of semi-structured teaching tasks which were adapted from Block and Block (1980). The tasks were designed to be just beyond the level of difficulty that the child could complete alone, and mothers were instructed to help the child as much as they thought the child needed, while allowing the child to do as much work as they could independently. The teaching task protocol lasted 20 min and included (a) sorting beads by color and shape, (b) building blocks to match a model figure, (c) naming things with wheels, and (d) completing a collaborative maze.

Independent coders who were naïve to other information about the family evaluated mothers' parenting quality during each task using 7-point scales (Carlson, Jacobvitz, & Sroufe, 1995; Egeland, Pianta, & O'brien, 1993). Coders were trained to reliability by the second author who was instructed by Drs. Byron Egeland and Alan Sroufe, the original authors of this coding protocol. Coders were six doctoral students and six advanced undergraduate or post-baccalaureate research assistants. Coding disagreements were resolved in weekly consensus meetings with all team members, and consensus scores were averaged across tasks to index three facets of insensitive parenting, namely supportive presence, intrusiveness, and hostility. Coding assignments were counterbalanced across tasks, coding teams were rotated, and ~ 10% of cases were coded by all teams to minimize carryover effects, ensure adherence to the coding protocol, and mitigate observer drift.

Supportive presence captured the extent to which the mother provided a secure base for the child and remained attentive to the child's needs for the duration of the task (Egeland, 1982). Support was the only domain that was reverse scored, such that a score of 7 indicated low support and a score of 1 indicated high support ($M = 3.14$, $SD = 0.81$; ICC = 0.81). Intrusiveness assessed the extent to which the mother lacked respect for the child as an individual and failed to recognize the child's efforts to gain autonomy with higher scores connoting greater levels of intrusiveness ($M = 2.79$, $SD = 0.82$; ICC = 0.75). Hostility was indicated by the mother's expression of anger, discounting, or rejection of the child with higher scores reflecting greater hostility ($M = 1.47$, $SD = 0.49$; ICC = 0.80).

Insensitive parenting practices were strongly and positively

associated – maternal supportive presence (reverse-scored so high scores indicated poor support) was positively associated with both intrusiveness, $r = 0.58$, $p < 0.001$, and hostility, $r = 0.54$, $p < 0.001$, and intrusiveness was positively associated with hostility, $r = 0.41$, $p < 0.001$. Therefore, consistent with prior research (Barnett, Shanahan, Deng, Haskett, & Cox, 2010; Carlson et al., 1995; Egeland et al., 1993; Mansoor et al., 2012), we created a composite measure of insensitive parenting by taking the average of standardized ratings of support (reverse-scored), intrusiveness and hostility ($\alpha = 0.75$). Importantly, the insensitive parenting construct ranged along a continuum from negative scores connoting high support, low intrusion, and low hostility to positive scores connoting low support, high intrusion, and high hostility.

Harsh maternal representations

At age 6, children completed five stems from the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim et al., 1993) using a "family" of grey rabbits from the Calico Critters™ doll series. Examiners presented typical family situations and conflicts to the child using the doll rabbits and invited the child to "Show me and tell me what happens next." Examiners provided encouragement in accordance with standardized guidelines (e.g., "Does anything else happen in the story?") and structured queries if the child did not spontaneously address (or apprehend) the main theme of the story (e.g., "What did they do about George's burned hand?"). Following a warm-up family story, children were presented with the following stems designed to capture narratives about 1) child injury (Hot Gravy), 2) parent comfort (Monster Under The Bed), 3) parental conflict (Lost Keys), 4) separation from parents (Departure), and 5) reunion with parents (Reunion; see Bretherton, Oppenheim et al., 1990 for details). Harsh and excessively punitive maternal behaviors, such as mother throwing the pot of hot gravy at the child or "screaming" at the child, were scored present (1) or absent (0) within each story (Robinson, Mantz-Simmons, & Macfie, 1996).

Coders who were naïve to all other information about the family were trained to reliability by Dr. Jenny Macfie who co-authored the Narrative Coding Manual (Robinson et al., 1996). Coders were two doctoral students and two post-baccalaureate research assistants. Coding disagreements were resolved in weekly consensus meetings with all team members, and consensus scores were summed across the five stories to indicate the child's harsh maternal representations (ICC = 0.737 across 57.4% of the cases).

The MSSB has been used extensively to assess children's representations and demonstrates strong validity and reliability within diverse populations (Howes, Vu, & Hamilton, 2011; Schechter et al., 2007). All analyses also controlled for prior harsh maternal representations, which were assessed at age 4, using the same administration and coding protocols, but with a slightly different subset of stories (i.e., the Spilled Juice and Park Outing stories assessed parental comfort at wave 1, rather than Monster Under the Bed, yielding a total of six stories at age 4; ICC = 0.850 across 48.4% of cases).

Teacher-child conflict

Following the assessments at ages 6 and 7, children's teachers completed a modified short-form of the Student Teacher Relationship Scale (STRS; Pianta, 2001), which was included in the MacArthur Health and Behavior Questionnaire (MHBQ; Boyce et al., 2002; Essex et al., 2002). Teachers indicated how much they agreed with five statements pertaining to conflict in the teacher-child relationship (e.g., "You and this child always seem to be struggling with each other") on a 5- point Likert scale from definitely applies (5) to definitely does not apply (1). The STRS has been widely used to assess the quality of teacher-child relationships and evidences strong validity and reliability in diverse populations, including in the current sample ($\alpha_{age6} = 0.902$ and $\alpha_{age7} = 0.906$; Decker, Dona, & Christenson, 2007; Gregoriadis & Tsigilis, 2008).

Academic achievement

At ages 6 and 8, children completed the Letter-Word and Applied Problems subtests from the Woodcock Johnson III Tests of Achievement (WJ-III) to assess reading and math achievement, respectively (Woodcock, McGrew, & Mather, 2001). The WJ-III is a well-validated measure of academic achievement designed for use from age 2 to adulthood. Time constraints precluded our administration of the full WJ-III battery. However, the Letter-word and Applied Problems subtests evidence robust psychometric properties and have been used in prior studies to provide an abbreviated achievement assessment (Blair et al., 2015; Matthews, Ponitz, & Morrison, 2009). In the Letter-Word subtest, children were asked to read a series of increasingly difficult words out loud beginning with a six-item basal level and continuing until six consecutive items were missed. In the Applied Problems subtest, children were read a series of mathematical story problems for which they supplied calculated, rather than multiple choice, answers using scratch paper as needed. Analyses were computed using the average of children's age-standardized scores for the Letter-Word and Applied Problems subtests.

Child IQ

At age 4, child IQ was assessed using the Vocabulary and Block Design subtests of the Wechsler Preschool and Primary Scale of Intelligence – III (Wechsler, 2002). Verbal IQ was measured using the Vocabulary test in which the child pointed at pictures to identify orally presented words for children who were < 48 months of age, or verbally explained what orally-presented words meant for children who were 48 months or older. The age appropriate measure of vocabulary was used to assess each child's verbal ability ($M = 96.93$, $SD = 15.30$). Performance IQ was assessed using the Block Design subtest in which the child was asked to assemble red and white blocks to match models ($M = 92.97$, $SD = 17.65$). Following Sattler (2008), estimated Verbal and Performance IQs were averaged to yield a pro-rated measure of Full-Scale IQ ($M = 95.10$, $SD = 13.57$).

Family SES

At age 4, family SES was calculated using the Hollingshead (1975) Four-Factor Index of Social Status, based on a composite of caregiver education and occupational status. Education codes ranged from 1 (i.e., less than seventh grade) to 7 (i.e., graduate or professional training). Occupational scores ranged from 1 (i.e., farm laborers and unskilled service workers) to 9 (i.e., executives and major professionals). Education codes were multiplied by three and occupation codes were multiplied by five. Scores were summed within caregiver and then averaged across caregivers (in cases with two caregivers in the home) to yield a family SES score. At age 4, family SES scores ranged from 13 (e.g., unemployed with a 10th grade education) to 66 (e.g., an attorney with a graduate degree) with higher scores connoting higher SES ($M_{SES} = 32.01$, $SD = 12.20$, e.g., sales clerk).

Data analytic plan

All analyses were conducted in SPSS version 25. Data were examined for non-normality to render parametric statistics valid (Afifi, Kotlerman, Ettner, & Cowan, 2007). A multivariate analysis of variance (MANOVA) evaluated group differences across study variables as a function of the child's sex, ethnicity-race, and their interaction. Correlation analyses assessed bivariate relations among study variables. Hayes' (2013) PROCESS routine evaluated the indirect effects of insensitive parenting at age 4 on academic achievement at age 8 as mediated by the child's harsh maternal representations at age 6 and teacher conflict at age 7. Per contemporary mediation guidelines (Hayes & Rockwood, 2017), we evaluated specific indirect pathways regardless of direct relations between predictors and outcomes in the full model. Restricting investigations of indirect effects to traditional mediation models in which direct pathways must attain significance

(c.f., Baron & Kenny, 1986) may hinder the ability to detect conceptually and statistically significant pathways (Hayes, 2009), particularly when suppressor effects are operative (Rucker, Preacher, Tormala, & Petty, 2011). Moreover, the PROCESS routine replaces the sequential model analyses proposed by Baron and Kenny (1986) with a more parsimonious, integrative evaluation of mediation with reduced type 1 error (Hayes & Rockwood, 2017).

Results yielded 95% bootstrapped confidence intervals (CIs) for unconditional effects. Bootstrapping is a nonparametric technique that minimizes the influence of non-normality across study variables and yields a more reliable estimation of mediation than Sobel's (1982) test, particularly in smaller samples (Preacher, Rucker, & Hayes, 2007; van Jaarsveld, Walker, & Skarlicki, 2010). Bootstrapping also allows for direct estimation of mediation and mitigates power problems due to the asymmetric and non-normal sampling distribution of indirect effects (Edwards & Lambert, 2007). Predictors were centered to reduce multicollinearity (Kraemer & Blasey, 2004). All models controlled for child gender, child ethnicity-race, child IQ, family SES, prior harsh maternal representation, prior teacher-child conflict, and prior academic achievement. All study variables were regressed on all covariates to support inferences about change.

Of the 245 participating children at age 4, 14 (5.7%) were missing representational data due to child factors (e.g., distress, refusal; $n = 9$) or video errors ($n = 5$). Of the 209 children who completed the age 6 assessment, 4 (1.9%) were missing representational data due to video errors, and 56 (26.8%) were missing teacher data due to the child not attending school ($n = 1$), incomplete teacher data returned ($n = 10$), caregiver refusal ($n = 2$), or teacher non-response/passive refusal ($n = 43$). Of the 191 children who completed the age 7 assessment, 67 (35.1%) were missing teacher data due to the child not attending school ($n = 2$), inability to locate the teacher ($n = 16$), incomplete teacher data returned ($n = 8$), or teacher non-response/passive refusal ($n = 41$). Finally, of the 209 and 203 children who completed the age 6 and 8 visits, respectively, achievement data were missing for one child (0.5%) at age 6 because the child left early due to illness and for one child (0.5%) at age 8 due to an administration error. Independent samples t-tests revealed no significant differences across all study variables between children with and without missing data. Likewise, chi-square analyses indicated there were no differences in child gender or ethnicity-race across missing data groups.

Missing data were imputed using the expectation maximization (EM) algorithm across 100 iterations as supported by Little's (1988) MCAR test, $\chi^2 (117) = 134.554$, $p = 0.128$ (Schafer & Graham, 2002). The EM algorithm uses multiple imputation methods to impute values into a single data set, rather than listwise deletion or imputation across multiple data sets, which was the only estimation method available in previous versions of SPSS. The pattern of obtained findings was consistent across both the raw and imputed data sets, though their significance varied due to the high rate of missing teacher data. Together, these preliminary analyses justified the use of the full sample, despite the high rate of missing teacher data, which was comparable to teacher participation rates in other survey-based studies (Horton & Laird, 2001; Izzo, Weissberg, Kasprow, & Fendrich, 1999; Youngstrom, Findling, & Calabrese, 2003).

Results

Descriptive and bivariate analyses

Descriptive statistics and bivariate correlations are shown in Table 1. A MANOVA revealed significant differences across study variables by child gender (Wilks' $\lambda = 0.757$, $p = 0.030$), ethnicity-race (Wilks' $\lambda = 0.371$, $p < 0.001$), and their interaction (Wilks' $\lambda = 0.539$, $p = 0.035$). Regarding gender, teachers of boys reported higher levels of teacher-child conflict at both time points ($M_{age\ 6} = 1.931$; $M_{age\ 7} = 1.842$) as compared to girls ($M_{age\ 6} = 1.633$; M_{age}

$_7 = 1.391$). Regarding ethnicity-race, there were significant differences across groups with respect to child IQ, academic achievement, and teacher-child conflict. Post-hoc Bonferroni-corrected comparisons indicated that both white and multi-ethnic/racial participants scored higher on the IQ subtests when compared to Latinx children ($M_{white} = 111.000$; $M_{multi} = 103.636$; $M_{Latinx} = 94.700$), but not when compared to Black children ($M_{Black} = 97.375$). Although there were ethnic-racial differences in achievement at ages 6 and 8, none of the pairwise comparisons attained significance across ethnic-racial groups. At age 6, levels of teacher-child conflict did not significantly differ by ethnicity-race. However, at age 8, teachers of Black children reported significantly higher levels of teacher-child conflict ($M = 2.440$) than teachers of Latinx ($M = 1.355$) and multi-ethnic/racial children ($M = 1.473$), but not than white children ($M = 1.514$). Finally, there were significant interactions of child gender with ethnicity-race for age 4 child IQ ($p = 0.009$) and for age 6 teacher-child conflict ($p = .042$). Girls earned higher IQ scores in all ethnic-racial groups, except among white children where boys earned higher scores than girls. Additionally, teachers reported greater levels of conflict with boys than girls at age 6 in all ethnic-racial groups, except among Black children where teachers reported more conflict with girls than boys.

Bivariate analyses indicated that family SES was negatively related to insensitive parenting and positively related to child IQ and academic achievement. Child IQ was negatively related to insensitive parenting, harsh maternal representations, and teacher-child conflict, but it was positively related to academic achievement. Insensitive parenting was positively related to harsh maternal representations and teacher-child conflict, but negatively related to academic achievement. Harsh maternal representations were positively associated with teacher-child conflict, but negatively associated with academic achievement. Teacher-child conflict was negatively associated with academic achievement.

Mediation

A sequential mediation analysis evaluated prospective relations between observations of insensitive parenting practices characterized by low support, high intrusiveness and high hostility at age 4 with children's academic achievement four years later as mediated by children's harsh maternal representations at age 6 and teacher-child conflict at age 7. Fig. 1 displays the unstandardized coefficients for the direct and indirect pathways. Table 2 depicts the parameter estimates and 95% bootstrapped confidence intervals (CI) across 5000 resamples for the direct and indirect pathways, as well as the control variables. The direct effects from insensitive parenting to academic achievement and from harsh maternal representations to academic achievement were not significant, but the direct effect from insensitive parenting to teacher-child conflict was significant ($b = 0.092$, SE $= 0.043$, $p = 0.036$, 95% CI [0.006, 0.177]). Mediation analyses revealed a significant indirect effect from observed insensitive parenting at age 4 to decreased academic achievement at age 8 via increases in children's harsh maternal representations at age 6 and increases in teacher-child conflict at age 7, even when family SES, child IQ, child gender, child ethnicity-race, prior harsh maternal representations at age 4, prior teacher-child conflict at age 6, and prior academic achievement at age 6 were held constant ($b = 0.135$, SE $= 0.084$, 95% CI [-0.338, -0.015]).

Discussion

Evidence supporting specific pathways by which insensitive parenting may eventuate in negative educational outcomes as a function of children's relational representations and teacher-child conflict represents an important advance in ongoing efforts to understand how parenting behaviors may influence children's academic achievement. The current analyses revealed a significant indirect effect of insensitive

Table 1
Descriptive statistics and bivariate correlations among study variables.

	M (SD)	1	2	3	4	5	6	7	8	9
1. SES (age 4)	32.012 (12.198)	–	–	–	–	–	–	–	–	–
2. IQ (age 4)	95.100 (13.513)	0.251**	–	–	–	–	–	–	–	–
3. Insensitive parenting (age 4)	0.000 (0.821)	−0.179**	−0.192**	–	–	–	–	–	–	–
4. Harsh mother rep. (age 4)	0.123 (0.152)	−0.014	−0.110	0.198**	–	–	–	–	–	–
5. Harsh mother rep. (age 6)	0.049 (0.103)	0.126	−0.171*	0.200**	0.011	–	–	–	–	–
6. Teacher-child conflict (age 6)	1.775 (0.969)	−0.148	−0.065	0.311**	0.041	0.031	–	–	–	–
7. Teacher-child conflict (age 7)	1.608 (0.865)	−0.085	−0.188*	0.339**	0.293**	0.293**	0.501**	–	–	–
8. Achievement (age 6)	104.680 (12.556)	0.217**	0.557**	−0.256**	−0.028	−0.121	−0.137	−0.137	–	–
9. Achievement (age 8)	102.765 (14.910)	0.278**	0.558**	−0.325**	−0.211**	−0.371**	−0.249**	−0.371**	0.751**	–

* $p < 0.05$.
** $p < 0.01$.

parenting on children's achievement via both representational and relational processes. Specifically, mothers' insensitive parenting practices predicted increases in children's harsh maternal representations from ages 4 to 6, and, in turn, children's harsh maternal representations predicted increased levels of later teacher-child conflict above prior levels, which then predicted significant declines in children's academic achievement. Importantly, this pathway was robust to controls for child gender, family SES, child IQ, child ethnicity-race, and prior levels of each study variable.

Albeit small, this significant indirect effect of parenting quality on children's early academic achievement is likely to have enduring (and potentially expanding) implications for children's educational outcomes. Extant literature demonstrates the disproportionate significance of children's relationships with teachers during the elementary school years for shaping their initial attitudes toward school (Heatly & Votruba-Drzal, 2019), setting the stage for future teacher-child

relationships (Jerome et al., 2009), and initiating achievement pathways that become increasingly entrenched over time (Maldonado-Carreño & Votruba-Drzal, 2011; Yeo & Clarke, 2006). Thus, our findings highlight the importance and lasting impact of parenting in early childhood for children's future relationships, including those they form with teachers throughout their educational endeavors.

The absence of a significant direct effect from insensitive parenting to achievement in the full model was somewhat surprising, particularly given prior findings with younger children (e.g., Bornstein et al., 2020) and the moderate and negative bivariate associations between insensitive parenting and academic achievement at ages and 6 and 8 in this sample. Pathways from parenting to children's achievement are manifold, and it is likely that the same parenting processes evidence differential impacts on children's achievement across subpopulations of children in ways that could not be examined here. Indeed, contemporary approaches to mediation analysis emphasize the importance
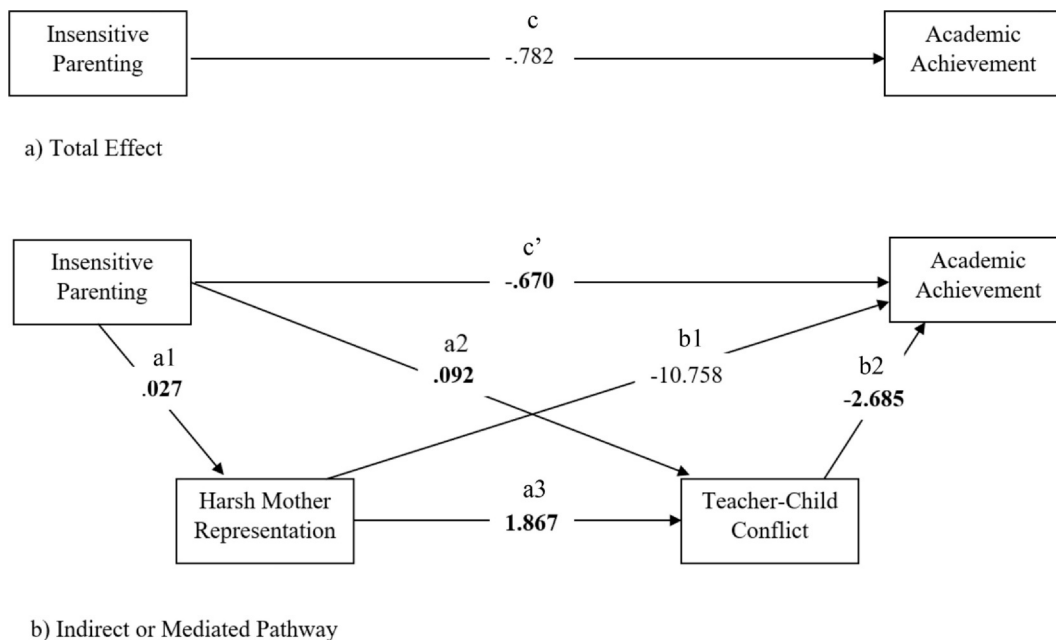

Fig. 1. A sequential mediation model with harsh maternal representation (age 6) and teacher-child conflict (age 7) as mediators of insensitive parenting (age 4) effects on academic achievement (age 8). Pathways depict unstandardized coefficients with significant relations indicated in bold.

Table 2

Regression of children's academic achievement on insensitive parenting as mediated by harsh maternal representations and teacher-child conflict.

Variable		M_1 (HMR)				M_2 (TCC)				Y (ACH)		
		b (Bootstrapped SE)	p	(95% CI; bias-corrected)		b (Bootstrapped SE)	p	(95% CI; bias-corrected)		b (Bootstrapped SE)	p	(95% CI; bias-corrected)
X (INS)	a_1	**0.027 (0.008)**	**0.001**	**(0.011, 0.043)**	a_2	**0.092 (0.043)**	**0.036**	**(0.006, 177)**	c	−0.782 (0.761)	0.305	(−2.282, 0.718)
M_1 (HMR)		–	–	–	a_3	**1.867 (0.343)**	**< 0.001**	**(1.192, 2.542)**	b_1	−10.758 (6.322)	0.090	(−23.213, 1.697)
M_2 (TCC)		–	–	–		–	–	–	b_2	**−2.685 (1.134)**	**0.019**	**(−4.919, −0.451)**
Constant	i_{M1}	0.142 (0.061)	0.090	(−23.213,1.697)	i_{M2}	1.459 (0.323)	0.090	(−23.213, 1.697)	i_y	**16.019 (5.847)**	**0.001**	**(4.410, 27.540)**
Sex		**−0.017 (0.012)**	**0.019**	**(−4.919, −0.451)**		−0.113 (0.064)	0.081	(−0.240, 0.014)		−1.66 (1.126)	0.141	(−3.879, 0.556)
Race-ethnicity		−0.001 (0.012)	0.055	(−2.936, 0.033)		**−0.144 (0.064)**	**0.026**	**(−0.270, −0.017)**		−1.634 (1.124)	0.147	(−3.850, 0.581)
SES		**0.002 (0.000)**	**0.001**	**(0.001, 0.003)**		0.001 (0.003)	0.747	(−0.004, 0.006)		0.063 (0.047)	0.184	(−0.030, 0.156)
IQ		−0.001 (0.000)	0.052	(−0.002, 0.000)		−0.010 (0.003)	.747	(−0.004, 0.006)		**0.165 (0.052)**	**0.002**	**(0.062, 0.267)**
Prior HMR		−0.033 (0.042)	0.305	(−2.282, 0.718)		0.189 (0.220)	0.392	(−0.245, 0.623)		−0.883 (3.835)	0.818	(−8.439, 6.673)
Prior TCC		−0.003 (0.042)	0.750	(−0.018, 0.013)		**0.456 (0.042)**	**< 0.001**	**(0.372, 0.539)**		−0.471 (0.901)	0.602	(−2.244, 1.304)
Prior ACH		−0.0003 (0.001)	0.630	(−0.001, 0.001)		0.003 (0.003)	0.340	(−0.003, 0.009)		**0.728 (0.056)**	**< 0.001**	**(0.617, 0.839)**
a_1b_1						–	–	–		−0.289 (0.205)		(−0.746, 0.080)
INS→HMR												
a_2b_2		–	–	–		–	–	–		−0.246 (0.186)		(−0.697, 0.003)
INS→TCC												
$a_1a_3b_2$		–	–	–		–	–	–		**−0.135 (0.084)**		**(−0.338, −0.015)**
INS→HMR→TCC												
Total Indirect Effect of X		–	–	–		–	–	–		**−0.670 (0.303)**		**(−1.350, -0.190)**
		$R^2 = 0.115$				$R^2 = 0.541$				$R^2 = 0.666$		
		$F(8,236) = 3.838, p = 0.0003$				$F(9,235) = 30.724, p < 0.001$				$F(10,234) = 46.730, p < 0.001$		

Note. INS: insensitive parenting; HMR: harsh maternal representations; TCC: teacher-child conflict; ACH: achievement. Bold text denotes significant coefficients.

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of evaluating specific indirect effects, even in the absence of significant direct effects (Hayes & Rockwood, 2017), precisely because Baron and Kenny's (1986) classic requirement for significant direct relations may preclude the ability to detect conceptually important and statistically significant mediating relations when such opposing pathways may be operative (i.e., suppressor effects; Rucker et al., 2011).

Direct parenting effects may also dissipate over time as mediating processes take on increased salience. As indicated here, and consistent with prior suggestions by Sabol and Pianta (2012), early caregiving relationships may impact later relationship experiences indirectly via representational processes (Page & Bretherton, 2001; Sroufe et al., 1999; Vu, 2015). In turn, direct relations between parenting quality and children's academic achievement may become less pronounced across development as children's relationships with teachers shape achievement trajectories as much or more so than early caregiving qualities.

Consistent with prior research, the current study revealed significant pathways from parenting quality to children's representations of their caregivers (Kerns, Brumariu, & Seibert, 2011; Zvara & Mills-Koonce, 2019), and from children's caregiver representations to teacher-child relationship quality (Jerome et al., 2009; O'Connor & McCartney, 2006; Rydell et al., 2005; Sabol & Pianta, 2012; Schuengel, 2012). These findings indicate that, in the wake of insensitive parenting experiences, children may carry negative relationship expectations from their families of origin into the teacher-child relationship resulting in heightened levels of tension and conflict that, ultimately, undermine effective learning and long-term academic achievement. Indeed, a robust body of evidence points to strong associations between teacher-child relationship qualities and academic achievement (McCormick et al., 2013; Mercer & DeRosier, 2008; Pianta & Stuhlman, 2004), with particularly strong relations between teacher-child conflict and problematic school outcomes (Mercer & DeRosier, 2008; Varghese et al., 2019). The current findings are particularly notable given that children's academic achievement was assessed using an objective achievement measure outside the school setting, rather than teacher reports.

Strengths and limitations

The current study featured several methodological strengths that support new insights into the antecedents of children's academic achievement generally, and mechanisms by which parenting processes may shape the early transition to school in particular. Using prospective data across four different time points while controlling for prior levels of each study construct supported a stronger degree of directional inference than cross-sectional research designs. Moreover, concerns regarding common-method variance were mitigated by our use of multiple informants (i.e., observers, children and teachers) and methods (i.e., questionnaires, observational tasks, narrative measures and standardized tests). Despite these contributions, however, a number of limitations qualify our findings and point to promising directions for future research.

First, although we recognize that parenting influences on children's achievement are impacted by additional sociodemographic factors, such as neighborhood context (e.g., Greenman, Bodovski, & Reed, 2011) and culture (e.g., Jerome et al., 2009), we were unable to probe for potential moderators in this study given the complexity of the proposed model in concert with our limited sample size. There is a particularly pressing need for research to examine these processes within and across specific ethnic-racial groups, in light of persistent ethnic-racial disparities in reading and math achievement such that white students continue to earn higher achievement scores than their Black and Latinx peers (National Assessment of Educational Progress, 2017). Indeed, recent work suggests ethnic-racial achievement gaps persist even when other important factors, such as poverty status, are held constant (Paschall, Gershoff, & Kuhfeld, 2018). Substantial evidence indicates that certain parenting behaviors are associated with negative child outcomes in some ethnic-racial groups or in certain

neighborhood contexts, but not in others (e.g., Deater-Deckard et al., 2011; Mason, Cauce, Gonzales, & Hiraga, 1996). For example, intrusiveness may be interpreted as more normative in Latinx families and, as a result, appears to be less strongly related to negative child outcomes in Latinx families as compared to other ethnic-racial groups (Halgunseth, Ispa, & Rudy, 2006; Ispa et al., 2013). Indeed, in a recent study, insensitive parenting was associated with poorer kindergarten reading achievement among African American children, but not among Mexican American children (Caughy, Mills, Owen, Dyer, & Oshri, 2017). Likewise, given the known significance of intersectionality (Warner & Brown, 2011), particularly in caregiving (Jackson, Choi, & Preston, 2019) and educational settings (Baird & Keene, 2019), a true picture of these effects must consider both gender and ethnicity-race. In the present study, for example, teachers generally endorsed higher levels of conflict with boys than girls, but there was some indication this pattern may vary across ethnic-racial groups and/or developmental time. In sum, given the multiply-determined nature of academic achievement, future research needs to evaluate various interacting factors that were beyond the scope of the current study, including those at individual (e.g., achievement motivation), family (e.g., parental involvement), environmental (e.g., economic status), and cultural (e.g., family ethnic socialization) levels of analysis.

Second, and related to aforementioned limitations of the current sample, this investigation of parenting quality was limited to mothers (and mother-figures). Thus, additional research is needed to evaluate the proposed model among father-child dyads. This is particularly important given accumulating evidence of paternal influences on children's early learning and school adjustment (Jeynes, 2015; Kim & Hill, 2015).

Third, the current study evaluated children's representational and relational processes as two of many potential mediators of parenting effects on child achievement. Additional mediators, such as self-regulation (Weis, Trommsdorff, & Muñoz, 2016), as well as potential moderators of these relations, warrant consideration in future research. For example, a number of factors beyond children's representations may influence the teacher-child relationship, including ethnic-racial match (Glock & Schuchart, 2020), gender match (Watson et al., 2019), teacher-student ratio (Shin & Raudenbush, 2011), and teacher training (Feng & Sass, 2013). Likewise, the same processes that support or undermine sensitive parenting may also promote or hinder parent-teacher relationships. Thus, a hostile or intrusive parent may carry these dynamics into the parent-teacher relationship in ways that taint the teachers' perceptions of the child. Indeed, this hypothesis is consistent with prior evidence that teacher-parent relationship quality is a powerful predictor of teacher-child relationship quality (Chung, Marvin, & Churchill, 2005), as well as with evidence that parental depressive symptoms negatively impact parent-teacher relations (e.g., Kohl, Lengua, & McMahon, 2000).

Fourth, consistent with prior research, we created a composite score to indicate mothers' insensitive parenting, however, future investigations should examine more nuanced associations between children's academic achievement and specific indices of insensitivity (e.g., intrusiveness versus hostility). This may be especially important in light of the aforementioned evidence that specific parenting practices may have differential implications for children's adaptation across ethnic-racial groups.

Fifth, given the time constraints of each assessment, we were limited to abbreviated measures of children's IQ and academic achievement. Although these abbreviated measures have been used in prior research (e.g., Blair et al., 2015; Matthews et al., 2009; Sattler, 2008), this study would have benefited from the administration of full, rather than partial, assessment batteries. Likewise, future research on parenting and children's educational adjustment would be advanced by additional consideration of global achievement indicators, such as grade point average (GPA). That said, the elementary schools in this study rarely employed traditional measures of GPA, with most favoring class

performance evaluations using teacher narratives or various descriptive ratings (e.g., needs improvement, satisfactory, above-average). Future work would benefit from a more holistic evaluation of children's educational outcomes, particularly given known ethnic-racial disparities in standardized assessments of IQ and achievement (Paik & Walberg, 2007; Rojas-LeBouef & Slate, 2012).

Finally, as noted earlier, our inclusion of prior measures for each study variable in the full model strengthened our capacity to offer directional interpretations of the obtained findings. However, future research awaits the evaluation of a fully cross-lagged model wherein all constructs are assessed at all waves to support causal conclusions and fully elucidate hypothesized cascades from parenting to children's representations to children's relationships with teachers to children's academic achievement (Masten et al., 2005).

Implications for future research and practice

The current study contributes to a more comprehensive understanding of whether and how parenting quality influences children's academic achievement across the transition to formal schooling. Evidence shows that the early school transition instantiates educational trajectories that canalize over time (Maldonado-Carreño & Votruba-Drzal, 2011; Yeo & Clarke, 2006). Thus, the current results suggest that efforts to teach sensitive parenting behaviors in early childhood may indirectly support children's academic achievement by promoting positive caregiver representations and, by extension, close teacher-child relationships. There are several empirically supported approaches to supporting sensitive parenting (Juffer, Struis, Werner, & Bakermans-Kranenburg, 2017; Schoemaker et al., 2020; Shah, Kennedy, Clark, Bauer, & Schwartz, 2016). Although these approaches do not specifically focus on the family-school interface, recent findings from a training program to teach parents how to utilize autonomy support to engender children's homework motivation points to the likely effectiveness of intervention efforts targeting parent-child relationship features (Moè, Katz, & Alesi, 2018). Further work is needed to elucidate the optimal timing and delivery platform (e.g., individual versus group, home- versus school-based) for intervention efforts to support parenting and child achievement. That said, the effectiveness of any intervention rests on our capacity to integrate specific strengths and ameliorate unique vulnerabilities in a given community. Thus, we encourage collaborative, culturally-responsive intervention development approaches (Borelli et al., 2020).

In addition to the parent-child relationship, the current findings highlight the importance of teacher-child relationships for understanding children's early achievement outcomes. Thus, this study supports ongoing efforts to develop, implement, and evaluate programs to improve teacher-child relationships, such as Universal Teacher–Child Interaction Training (TCIT-U; Fawley, Stokes, Rainear, Rossi, & Budd, 2019; Lyon et al., 2009; Garbacz, Zychinski, Feuer, Carter, & Budd, 2014). Just as sensitive parenting can promote positive teacher-child relationships, so, too, might efforts to support teacher-child relationships improve children's representations of adult figures and relationships (Sabol & Pianta, 2012). Taken together, our findings indicate that, when it comes to improving children's academic achievement, research and policy efforts must expand levels of analysis and intervention beyond the individual child or teacher to include dyadic emphases on parent-child and teacher-child relationships.

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