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Maternal Support in Preschool and Child Behavior Problems: The Mediating Role of Childhood Emotion Knowledge

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Children's emotion knowledge encompasses abilities to recognize and label emotions in the service of positive adaptation. Drawing on a sociodemographically diverse sample of 250 children (50% female sex assigned at birth; $M_{age\_W1} = 49.02$ months, $SD = 2.99$) and their maternal caregivers (55.6% Latina; 37.6% poverty), this study evaluated a multiple mediation model to integrate heretofore distinct bodies of research examining (a) parenting effects on the development of emotion knowledge and (b) emotion knowledge effects on socioemotional adaptation. Observations of maternal supportive presence at age 4 predicted increases in children's emotion recognition and labeling from ages 4 to 8. However, only emotion labeling skills explained children's behavioral adjustment outcomes with a significant pathway from supportive parenting at age 4 to fewer externalizing and internalizing behavior problems at age 10 via improved emotion labeling skills. These findings suggest that emotion knowledge, particularly labeling skills, partially explains the protective impact of supportive parenting on behavioral adaptation across childhood. Prevention and intervention efforts should target both supportive parenting practices and emotion knowledge skill development to support children's socioemotional functioning and reduce behavior problems.

Public Significance Statement
The current findings illuminate the significant role of positive and supportive parenting behaviors in children's developing emotion knowledge skills, particularly labeling capacities, across the transition to formal schooling. Ongoing interventions that promote supportive caregiving, direct interventions to support children's emotion knowledge, and integrative efforts that harness the power of both have the potential to promote positive child development, particularly with regard to externalizing and internalizing behavior problems.

Keywords: child behavior problems, emotion knowledge, mediation, parenting

Parenting influences children's cognitive and socioemotional development, including their capacities to recognize and label emotion states (i.e., emotion knowledge; for review, see Trentacosta & Fine, 2010). *Emotion knowledge* is consistently related to positive child outcomes, such as peer acceptance and prosocial behavior (Ensor et al., 2011; Mostow et al., 2002), as well as to lower levels of externalizing, aggressive, and oppositional behavior problems (Cook et al., 1994; Schultz et al., 2004) and internalizing, depressive, and anxiety problems (Fine et al., 2003; C. Izard et al., 2001; McClure & Nowicki, 2001). Thus, emotion knowledge may be a modifiable mechanism undergirding positive parenting effects on children's later socioemotional and behavioral adjustment.

The present study drew on multimethod, multi-informant longitudinal data to integrate largely distinct bodies of research on (a) parenting and emotion knowledge and (b) emotion knowledge and child adaptation. First, we evaluated prospective relations between a global measure of positive parenting at age 4 (i.e., maternal supportive presence) and changes in two facets of children's emotion knowledge from ages 4 to 8 (i.e., emotion recognition and labeling). Second, we tested pathways from children's emotion recognition and labeling at age 8 to changes in children's externalizing (e.g., rule breaking, aggression, delinquency) and internalizing (e.g., anxiety/depression, withdraw, somatic complaints) behavior problems from ages 4 to 10. Third, we evaluated emotion recognition and labeling as potentially distinct mediators of expected relations from maternal supportive presence to reduced behavior problems across childhood. Finally, multigroup analyses evaluated the proposed model by child sex assigned at birth (i.e., female vs. male) and maternal ethnicity and race (i.e., Latina vs. non-Latina).

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Supportive Parenting and the Development of Emotion Knowledge

Emotion knowledge encompasses capacities to process emotion information gleaned from facial expressions, vocalizations, and body cues (Kusché, 1984). The present study focused on emotion recognition, which involves selecting a target emotion from a set of stimuli, such as images that depict different expressed emotions (e.g., "which child feels happy?"), and emotion labeling, which involves selecting the appropriate expressed emotion given a single stimulus (e.g., "does this child feel happy, sad, angry, or scared?"). Emotion recognition and labeling capacities develop in tandem across the first few years of life (Camras & Allison, 1985), though capacities for emotion recognition emerge somewhat earlier than those for emotion labeling (Harrigan, 1984). Whereas emotion recognition requires perceptual and receptive language abilities that enable the child to match emotion names (e.g., happy, sad, angry) to emotion expressions (e.g., a facial image), emotion labeling requires somewhat later developing expressive language abilities and semantic knowledge of labels for words (Harrigan, 1984). Building on prior studies of global emotion knowledge (for review, see Zinsser et al., 2021), this investigation answered recent calls for nuanced studies of emotion knowledge facets by evaluating emotion recognition and labeling as potentially distinct outgrowths of supportive parenting with correspondingly unique influences on adaptation (Barisnikov et al., 2022).

Attachment theory and research show that children's capacities for emotion recognition and labeling develop in the context of dyadic exchanges with their earliest caregivers (Sroufe, 1996; R. A. Thompson, 1994). Caregivers help children recognize and label their emotions in ways that confer a sense that one's emotion states can be known by others (and by oneself) and that emotions can be regulated with others (and—ultimately—on one's own) so the child does not become overwhelmed by their emotions (Siegel, 2004). As children develop, parents provide emotion socialization through explicit (e.g., emotion coaching; Cunningham et al., 2009) and implicit (e.g., parents' emotion displays; Denham & Kochanoff, 2002) processes. However, these emotion socialization processes occur in the context of broader parenting features, such as hostile or supportive parenting, which have received comparatively less attention in research on emotion knowledge.

Extant research on parenting and the development of children's emotion knowledge has emphasized the deleterious effects of negative parenting practices, such as harshness (Sullivan et al., 2010), intrusiveness (Berzenski & Yates, 2013), and maltreatment (Pears & Moses, 2003). However, a growing body of research suggests that positive parenting practices, such as sensitivity and support, also influence children's emotion knowledge development (Pintar Breen et al., 2018; Raikes & Thompson, 2006). Whereas sensitive parenting primarily involves timely and appropriate responsiveness to a child's immediate needs and signals (Belsky & Fearon, 2008; De Wolff & van Ijzendoorn, 1997), supportive parenting encompasses a broader range of behaviors that include not only warmth and responsiveness but also encouragement, instructional scaffolding, and the provision of a secure base for exploration and learning (Bornstein et al., 2020; Bradley et al., 2017). Bennett et al. (2005) showed that mothers' provision of support to their 2-year-old child during laboratory play tasks predicted better emotion recognition and labeling at age 4, over and above prior levels. Likewise, Merz et al. (2015) documented prospective relations between ratings of parents' warm acceptance of the child (e.g., smiles, praise, encouragement) and flexible responding to the child (e.g., following the child's lead) during a laboratory play observation at age 4 and children's global emotion knowledge (i.e., emotion recognition, labeling, and situational knowledge) 1 year later. Finally, Berzenski and Yates (2017) found that observations of maternal support at age 4 contributed uniquely to increased emotion knowledge across childhood, over and above temporally proximal observations of supportive presence at age 6.

Supportive parenting facilitates the development of children's emotion knowledge in several ways. First, supportive parenting fosters secure attachment and attuned coregulatory experiences that promote children's internalization of well-regulated affect (Consedine & Magai, 2003; Sroufe, 1996). Second, supportive parent–child exchanges promote children's capacities to perceive and interpret their own and their parents' behaviors in terms of intentionally motivated mental states (i.e., feelings, wishes, desires, and beliefs; Meins et al., 1998). In turn, these mentalization skills contribute to children's emotion understanding and regulation (Fonagy et al., 2002; Schwarzer et al., 2021). Third, supportive parents provide consistent and accurate emotion communication and socialization experiences, which enable children to more readily identify and understand expressed emotions and their underlying causes (McElwain et al., 2007). Thus, supportive parenting scaffolds children's appropriate emotion responses, models regulated emotional behaviors, and lays the foundation for children to emulate and internalize emotion understanding and regulation (Cunningham et al., 2009; Denham & Kochanoff, 2002).

The present study sought to enhance and broaden existing research on positive parenting and emotion knowledge by assessing prospective relations between mothers' supportive presence during the preschool period and children's growth in emotion recognition and labeling capacities from ages 4 to 8. This period of development is important because it coincides with marked improvements in children's cognitive abilities, such as memory and event anticipation, that are crucial for the development of children's emotion knowledge skills (Tremblay, 2000; Vasey et al., 1994). Moreover, the transition to school heightens the salience of emotion knowledge skills as children move from routinized family interactions to more complex social interactions with peers and teachers (Brown & Dunn, 1996).

The Adaptive Implications of Emotion Knowledge

Research across multiple contexts and domains of adaptation confirms the positive role of emotion knowledge in development (for review, see Trentacosta & Fine, 2010). In school, emotion knowledge is negatively associated with aggression (Schultz et al., 2004) and positively associated with academic achievement (Garner & Waajid, 2008), social competence (Rothman & Nowicki, 2004), peer popularity (Leppänen & Hietanen, 2001), and peer acceptance (Dunsmore et al., 2008). At home, emotion knowledge is positively associated with parent reports of children's cooperation, assertion, and self-control (Mostow et al., 2002) and negatively associated with their reports of both child externalizing and internalizing behavior problems (McClure & Nowicki, 2001; Morgan et al., 2010). Finally, as observed in laboratory settings, children with higher emotion knowledge skills also exhibit more prosocial behavior (Ensor et al., 2011).

Amid numerous studies showing positive relations between global emotion knowledge and child adaptation, emerging data suggest that individual facets of emotion knowledge may relate to specific adaptive outcomes in unique ways (Halberstadt et al., 2001; Mostow et al., 2002). For example, Fine et al. (2003) found that children's emotion labeling, but not a measure of situational emotion knowledge, was associated with lower teacher ratings of classroom internalizing, but not externalizing, problems 4 years later. Likewise, C. Izard et al. (2001) found that both emotion recognition and labeling at age 5 predicted internalizing, but not externalizing behavior problems, at age 9. In a recently study, Ip et al. (2019) found that a composite of emotion labeling and situation knowledge assessed from ages 2.5 to 4 years, but not a measure of emotion recognition during this same timeframe, increased the likelihood that a child would show initially severe but decreasing externalizing and internalizing problems from ages 3 to 10. In a meta-analysis across 11 emotion knowledge studies with children ages 3–5, Trentacosta and Fine (2010) found nearly identical effect sizes for preschoolers' externalizing and internalizing behavior problems ($r = -.15$ vs. $-.17$), but effects were larger for externalizing versus internalizing problems across the three studies of children ages 6–11 ($r = -.11$ vs. $-.02$). Together, these studies point to potentially differential effects of children's emotion recognition versus labeling skills on behavioral outcomes with regard to externalizing versus internalizing problems.

The Mediating Role of Emotion Knowledge in Parenting Effects on Child Behavior

Research shows that supportive parenting practices, such as warmth, praise, and scaffolding, contribute to positive child outcomes (Lucca et al., 2019; van der Storm et al., 2022), including fewer externalizing and internalizing behavior problems (Rothenberg et al., 2020). Building on research suggesting similarly positive parenting effects on children's emotion knowledge, this study tested whether children's emotion recognition and labeling skills explained expectedly negative relations between supportive parenting and children's externalizing and internalizing behavior problems from ages 4 to 10. Children initiate behavior problem trajectories during childhood years with enduring influences on development and adaptation (Bornstein, 1989). Thus, the current effort to understand relations among parenting, emotion knowledge, and behavioral adjustment during the school-age years has significant potential to inform efforts to promote positive youth development and prevent the emergence of behavior problems.

Although Eisenberg et al. (1998) offered a comprehensive model of the socialization of children's emotion knowledge and competence 25 years ago, only a handful of studies to date have explicitly evaluated an explanatory model of parenting effects on child adaptation via emotion knowledge. Using a cross-sectional research design, Garrett-Peters et al. (2017) found that concurrent relations between mothers' beliefs in the danger of children's emotions (e.g., "when children are too happy, they can get out of control") and children's poor classroom behavior in third grade was explained by children's emotion knowledge deficits. Likewise, McDowell and Parke (2000) found that parents' tendency to control their child's expression of emotion was related to worse social adjustment as indicated by teacher and peer sociometric ratings, and this relation was mediated by the negative effects of parental control on children's emotion knowledge. In a rare and recent longitudinal study by S. F. Thompson et al. (2020), relations between maternal depression and increases in children's externalizing and internalizing problems were explained by declines in children's emotion knowledge (i.e., emotion recognition and situational knowledge), controlling for prior adjustment and emotion knowledge. The present study extended this initial work by evaluating supportive parenting effects on children's externalizing versus internalizing problems via specific facets of emotion recognition versus labeling.

A Contextual View of Parenting, Emotion Knowledge, and Child Behavior

Research suggests that both child sex assigned at birth and parents' ethnicity and race could influence relations among parenting, emotion knowledge, and child behavior problems. For example, Martin and Green (2005) found that the use of emotion words during mother–child storytelling tasks was more strongly related to emotion knowledge for preschool boys than girls, which may reflect boys' greater reliance on parents for emotion learning given their relatively less well-developed executive control and verbal intelligence (Else-Quest et al., 2006; Zahn-Waxler et al., 2008). Cunningham et al. (2009) found that 11-year-olds' emotion knowledge, extending over time, explained pathways from emotion-specific parenting capacities (i.e., mother's awareness of her own and her child's emotions) to increased internalizing problems 6 months later for boys only and to improved social skills for girls only. These authors suggest that observed increases in boys' internalizing problems might reflect the influence of societal norms and expectations, such that boys who are more emotionally attuned due to enhanced emotion knowledge may be perceived by parents as more withdrawn or anxious because they do not conform to typical societal expectations that call for boys to be emotionally robust and outwardly exuberant. In this view, gender-based social expectations shape parent perceptions and behaviors in ways that reinforce traditional gender roles and potentially exacerbate boys' internalizing problems. In contrast, girls (and their socializing agents) may place greater value on social skills and relationships, such that emotion knowledge conferred a social advantage for girls in the study, whereas emotion knowledge deficits would be expected to eventuate in more externalizing behavior problems for girls as compared to boys (Lancelot & Nowicki, 1997).

Cultural identifications and practices may also shape pathways to and from children's emotion recognition and labeling skills (Wang et al., 2021). Thus far, most research on emotion knowledge in various ethnic and racial groups has focused on descriptive statistics, such as mean differences in skill levels across groups (Chronaki et al., 2018; Molina et al., 2014). However, some data suggest that Latine children are exposed to a more diverse array of positive and negative emotion experiences across and within caregivers (Mahrer et al., 2019), and this variability may magnify opportunities for children to learn about a broader range of emotions (Pavarini et al., 2013). From early childhood to adolescence, Latine parents demonstrate more rejecting actions and adopt more stringent disciplinary methods than European and European American parents (Cardona et al., 2000; Varela et al., 2004). At the same time, however, Latine parents also express comparatively higher rates of nurturance, acceptance, and affection (Domenech Rodríguez et al., 2009; White et al., 2013). In concert,

these parenting features expose Latine children to a comparatively broad spectrum of positive and negative emotion expressions, which may enhance their emotion knowledge skills (Mahrer et al., 2019; Pavarini et al., 2013).

Importantly, the effects of parenting on externalizing and internalizing problems may also vary by cultural context (Domenech Rodríguez et al., 2009). For example, although research suggests that negative parenting is associated with elevated child externalizing and internalizing problems in early childhood for White children, these patterns may differ for Latine children wherein some parenting facets, particularly intrusiveness, may be interpreted as normative parental investment (Ispa et al., 2004; Ruiz-Ortiz et al., 2017). We did not code specific facets of emotion socialization, such as the intensity or frequency of parents' expressed emotion directed at the child. Given likely influences of child sex assigned at birth and parental ethnicity and race on parenting, emotion knowledge, and their adaptive consequences, this study evaluated the proposed multiple mediation model in groups of female versus male children and Latina versus non-Latina mothers.

The Present Study

The present study evaluated a multiple mediation model from observations of maternal supportive parenting at age 4 to expected declines in children's externalizing and internalizing behavior problems as reported by examiners from ages 4 to 10, via predicted improvements in children's emotion recognition and labeling skills from ages 4 to 8. First, we hypothesized that mothers' support for their preschool-aged child during a series of laboratory problem solving and interactive tasks at age 4 would predict increases in children's abilities to recognize and label emotions from ages 4 to 8. Of note, against the backdrop of generally positive contributions to children's emotion recognition and labeling skills, we predicted that maternal support would be especially salient for emotion labeling because it requires higher order cognitive skills (e.g., expressive language abilities, semantic knowledge of labels for words) that are developed through early interaction and communication with caregivers (Harrigan, 1984; Vicari et al., 2000). Second, we hypothesized that children's emotion knowledge facets would be associated with declining behavior problems, with particularly strong effects on children's externalizing problems versus internalizing problems (Halberstadt et al., 2001; Mostow et al., 2002). Third, we tested emotion recognition and labeling as predicted mediators of expected relations from maternal supportive presence to reduced behavior problems across childhood. Finally, we explored all pathways by child sex assigned at birth and maternal ethnicity.

In addition to multigroup analyses by child sex assigned at birth and maternal ethnicity, all models controlled for prior levels of child emotion knowledge and behavior problems, as well as family socioeconomic status (SES). On the one hand, economic hardship can exacerbate parent and family stress in ways that compromise supportive parenting and, by extension, children's emotional and behavioral development (Masarik & Conger, 2017). On the other hand, economic resources may directly support development by facilitating increased access to enriched and stable learning and living environments (Gershoff et al., 2007). Thus, we held economic influences on parenting, emotion knowledge, and child behavior as a constant in these analyses.

Method

Participants

Participants were drawn from an ongoing longitudinal study of development among 250 caregiver–child dyads. Dyads completed assessments when the children were 4 years old ($N = 250$, $M_{age} = 49.02$ months, $SD = 2.99$), 8 years old ($N = 207$, $M_{age} = 97.47$ months, $SD = 3.01$), and 10 years old ($N = 201$, $M_{age} = 115.31$ months, $SD = 3.22$). Children (50% female sex assigned at birth) were diverse with respect to ethnicity and race (46% Latine, 24.4% multiracial, 18% Black, 11.2% White, .4% Asian) and economic status (37.6% in poverty), which reflected the southern California community from which they were recruited (U.S. Census Bureau, 2007). Participating caregivers were biological mothers (91.2%); foster/adoptive mothers (3.6%); and grandmothers, aunts, or other kin serving in a maternal role (5.2%) and were similarly diverse with respect to ethnicity and race (55.6% Latina, 19.6% White, 19.2% Black, 5.6% multiracial). Maternal education levels were variable (i.e., 19.6% had not completed high school, 16% had a high school diploma or general educational development, 51.2% had some technical training or college coursework, and 13.2% had a bachelor's or higher degree). Just over half the mothers were employed (56.4%), and the majority were married (61.6%) or in a committed relationship (18.8%).

Procedure

Families were invited to participate in a longitudinal study of children's early learning and development via flyers placed in community-based child care centers. Exclusionary criteria included children with diagnosed developmental disabilities or delays ($n = 3$), children who were unable to understand English ($n = 4$), and children outside the recruitment age of 45–54 months (not tracked). Dyads completed comprehensive laboratory assessments at 4, 8, and 10 years of age, which consisted of measures with the child, the mother, and the mother and child interacting. Both the examiners and coders in this study were predominantly non-White (80%) and mirrored the ethnic and racial diversity of the participating families. Measures in these analyses included individually administered assessments of child verbal intelligence quotient (IQ; age 4), family SES (age 4), and emotion recognition and labeling (ages 4 and 8), as well as observational measures of mother–child interactions (age 4) and child behavior problems (ages 4 and 10). Assessments were video recorded, and survey measures were administered orally to all participants to mitigate concerns about English reading comprehension. Mothers were compensated at a rate of $25 per assessment hour, and children received a small gift after each visit. Informed consent was obtained from the child's legal guardian and assent was obtained from each child at the Age 8- and 10-year assessments. All procedures were approved by the human research review board of the participating university.

Measures

Child Verbal Intelligence

At age 4, children completed the expressive and receptive vocabulary subtests of the Wechsler Preschool and Primary Scale of Intelligence–III (Wechsler, 2002). Children under 48 months pointed at pictures to identify words to compute a receptive vocabulary score,

and children over 48 months verbally explained the meaning of words to compute an expressive vocabulary score. The age-relevant measure was used to compute a prorated verbal IQ for each child (M = 97.03, SD = 15.32). The normed internal consistency coefficient for the receptive and expressive vocabulary subtests is .95, which demonstrates their efficacy for assessing young children's verbal IQ (Rasheed et al., 2018).

Family SES

At age 4, family SES was evaluated based on parents' reported education level and occupational status using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975). Parent education was rated on a 7-point scale from (*less than seventh grade*) to (*graduate or professional training*). Occupational status was coded from (*cleaners/unskilled service workers*) to (*government officials/major professionals*). Weighted summed scores for Education × 3 and Occupation × 5 yielded a family SES score. In families with two parents, weighted composite scores were averaged. In this sample, SES scores ranged from 13 (e.g., construction worker) to 66 (e.g., business owner or director), with an average rating of 32.13 (SD = 12.14), corresponding to a semiskilled worker (e.g., salesperson).

Maternal Supportive Presence

At age 4, mother–child dyads completed a series of semistructured teaching and interactive tasks (i.e., color–shape matching, tower building, naming objects with wheels, and a collaborative maze; J. Block & Block 1980a). Examiners instructed mothers to provide as much help as they thought their child needed but that the child should do as much of the task as they could on their own. Independent coders who were naïve to all other information about the family evaluated mothers' supportive parenting during each task using a 7-point scale that 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; Sroufe et al., 1985). A mother scoring high on supportive presence (a score of 7) expressed positive regard, encouragement, and comfort to the child (e.g., "You got another one right;" "That's okay, just try again"). A mother scoring low on supportive presence did not provide encouragement, may have been passive, uninvolved, or aloof, and/or gave the impression that she was more concerned about her own adequacy in the setting than the child's needs (i.e., an achievement orientation vs. a child-centered, teaching orientation).

Although the teaching task protocol was initially used to assess child-level constructs, such as ego–resilience and ego–control (J. H. Block & Block 1980b), Drs. Byron Egeland and Alan Sroufe adapted the protocol to also capture parent–child relational dynamics, including supportive presence (Egeland, 1982; Sroufe et al., 1985). In the context of these semistructured teaching tasks, supportive presence can be readily observed as behaviors that, in addition to responsiveness, include encouragement, instructional scaffolding, and the provision of a secure base for exploration and learning (Bornstein et al., 2020; Bradley et al., 2017). In this view, supportive presence goes beyond the timely and appropriate responsiveness to the child's immediate needs and signals, which are more traditionally captured by attachment-based measures of sensitive parenting during separation–reunion and relationally stressful exchanges in earlier development (Belsky & Fearon, 2008; De Wolff & van Ijzendoorn, 1997). Likewise, the current measure of supportive presence extended beyond specific facets of emotion socialization such as the intensity or frequency of parents' expressed emotion directed at the child.

Coders were trained by the senior author who was directly trained by the manual developers, Drs. Byron Egeland and Alan Sroufe. Coders were doctoral students and advanced undergraduate or postbaccalaureate research assistants who received training across 25 randomly selected cases. Following training, the remaining cases were coded by teams of three to six coders with disagreements resolved in weekly consensus meetings. Coding assignments were counterbalanced across tasks to minimize carryover effects, and consensus scores were averaged across tasks to yield a singular rating of supportive parenting (intraclass correlation coefficient = .806). All cases were scored by at least three separate coders, with rotating team composition to mitigate observer drift. In addition, 10% of the cases were evaluated by all 12 coders to ensure consistent adherence to the manual and further reduce drift. Finally, the first 25 training cases were recoded by independent teams for use in these analyses.

Child Emotion Knowledge

Emotion knowledge was assessed at ages 4 and 8 using the Kusché (1984) Emotion Inventory. Both emotion recognition and labeling subtests were reduced from 40 to 30 items. Items capturing 15 primary emotions (i.e., angry, ashamed, confused, disappointed, embarrassed, excited, frustrated, happy, love, proud, sad, scared, surprised, tired, and worried) were retained in favor of those tapping five more ambiguous emotions (i.e., hate, fine, sure, lonely, and safe). These retained emotions are most frequently examined in research due to their basic and universally understood nature (Berzenski & Yates, 2017; Rhoades et al., 2009). Emotion recognition was assessed by asking the child to select a target emotion from four gender-matched line drawings of children expressing emotions (e.g., "Which boy/girl feels happy? Point to happy"). Emotion labeling was assessed by showing the child one line drawing and asking the child to select the expressed emotion from four gender-matched options (e.g., "Does this boy/girl feel happy, sad, angry, or scared?"). For both facets, each response was scored 0 (*wrong*), 1 (*wrong emotion, correct valence*), or 2 (*correct*). Composite scores for emotion recognition (α_{age4} = .739; α_{age8} = .761) and emotion labeling (α_{age4} = .758; α_{age8} = .796) were used in these analyses. The Kusche Emotional Inventory has been widely used across diverse populations of preschoolers and school-age children with regard to ethnicity, race, and economic status and has demonstrated validity in associations with social competence (Miller et al., 2005).

Externalizing and Internalizing Behavior Problems

Children's externalizing and internalizing problems were assessed by the child examiner using the Test Observation Form (McConaughy & Achenbach, 2004) following 3-hr laboratory assessments at ages 4 and 10. Examiners rated the child across 125 behavioral descriptors using a 4-point scale from 0 (*no occurrence of the behavior*), 1 (*very slight or ambiguous occurrence of the behavior*), 2 (*definite occurrence with mild to moderate intensity and frequency and less than 3 min total duration*), and 3 (*definitely occurrence with high intensity, high frequency, or 3 or more minutes total duration*). Broadband scales assessing externalizing

(e.g., rule breaking, aggressive behavior; $\alpha_{age4} = .887$; $\alpha_{age8} = .917$) and internalizing (e.g., anxious, withdrawn behavior; $\alpha_{age4} = .867$; $\alpha_{age8} = .851$) problems were used in these analyses. The Test Observation Form has been validated in a large sample of clinically referred and nonreferred children from varied ethnic and racial groups (McConaughy et al., 2009; Rettew et al., 2006).

Data Analytic Plan

Data Preparation and Missingness

All study variables were examined to ensure that they met nonnormality assumptions to render parametric statistics valid (Afifi et al., 2007). At age 8, the Emotion Recognition subscale was skewed and kurtotic ($skew_{original} = -2.49$, $kurtosis_{original} = 9.90$), but an arc sin transformation normalized the distribution for use in these analyses ($skew_{final} = -.59$, $kurtosis_{final} = 1.35$). Using IBM SPSS Statistics (Version 27), a multivariate analysis of variance followed by Bonferroni-corrected post hoc comparisons evaluated group differences across study variables as a function of the child's sex assigned at birth, maternal ethnicity and race, and their interaction. Correlation analyses assessed bivariate relations among study variables.

Data were missing for emotion knowledge at age 4 ($n = 8$; 3%) due to partial visits and at age 8 ($n = 43$; 17%) because 36 children did not complete the assessment, and an additional seven completed partial visits. Data were missing for externalizing and internalizing problems at age 4 ($n = 5$, 2%) because of partial visits and at age 10 ($n = 49$, 20%) because 36 children did not complete the assessment, and an additional 12 completed partial visits. There were no significant differences by child sex assigned at birth, maternal ethnicity and race, child verbal IQ, nor family SES when comparing the 218 (87.2%) dyads who completed two or more assessments to the 32 (12.8%) dyads who did not return for follow-up. Independent samples *t* tests showed that participants with missing data on emotion recognition and labeling skills at ages 4 and/or 8 did not significantly differ from those with complete data on either ratings of maternal supportive presence at age 4, or on examiner reports of externalizing or internalizing problems at ages 4 and 10. Likewise, there were no significant differences between children who were missing behavior problem ratings at ages 4 or 10 with regard to emotion recognition and labeling skills at ages 4 and 8. Attrition analyses supported our decision to address dating missingness using the full-information maximum-likelihood procedure, which is well-equipped for addressing large amounts of missing data without compromising power or introducing bias (Schafer & Graham, 2002). That said, given the presence of missing data, we also conducted a sensitivity analysis to evaluate the proposed model using the 169 participants with complete data at all waves.

Path Analyses

A path analysis using the lavaan package in RStudio (Rosseel, 2012) tested the unique contributions of observed maternal supportive presence at age 4 to changes in examiner ratings of children's externalizing and internalizing problems from ages 4 to 10 via simultaneously estimated pathways through emotion recognition and labeling at age 8. All analyses held family SES, child verbal IQ, prior child emotion knowledge, and prior examiner reports of externalizing and internalizing problems at age 4 constant. Follow-up multigroup analyses tested these effects by child sex assigned at birth (i.e., female vs. male) and maternal ethnicity (i.e., Latina vs. non-Latina). Satorra and Bentler's (2001) chi-square likelihood ratio difference test evaluated comparative fit between unconstrained models with all pathways freed between groups and constrained models with all pathways fixed to equality between groups. A significant chi-square difference test indicated improved fit of the unconstrained model as compared to the constrained model suggesting meaningful differences by group status.

Transparency and Openness

This study was not preregistered. Data, study materials, and analysis code are available upon request from the corresponding author.

Results

Descriptive Analyses

Table 1 depicts descriptive statistics and bivariate relations among study variables. A multivariate analysis of variance revealed significant main effects of child sex (Wilks' $\lambda = .868$; $p = .024$) and maternal ethnicity and race (Wilks' $\lambda = .709$; $p = .013$) but not their interaction (Wilks' $\lambda = .825$; $p = .616$). Regarding child sex, boys demonstrated more externalizing behavior problems at age 10 ($M_{boys} = 9.66$, $SD_{boys} = 8.90$) than girls, $M_{girls} = 5.95$, $SD_{girls} = 9.95$; $F(1, 168) = 9.161$, $p = .003$. Regarding maternal ethnicity and race, there were significant differences across groups with respect to child verbal IQ, $F(3, 166) = 5.176$, $p = .002$, and externalizing behavior problems at age 10, $F(3, 166) = 3.889$, $p = .010$. Post hoc Bonferroni-corrected comparisons indicated that both White and multiracial mothers had children who earned higher on verbal IQ scores as compared to Latina mothers ($M_{White} = 103.85$, $SD = 13.57$; $M_{multi} = 109.89$, $SD = 15.29$; $M_{Latina} = 95.40$, $SD = 13.71$) but not when compared to children of Black mothers ($M_{Black} = 98.34$, $SD = 14.36$). Latina mothers also had children who were rated lower on externalizing behavior problems when compared to children of Black mothers ($M_{Latina} = 6.11$, $SD = 7.68$; $M_{Black} = 12.31$, $SD = 11.57$) but not when compared to children of White or multiracial mothers ($M_{White} = 7.00$, $SD = 10.50$; $M_{multi} = 9.89$, $SD = 10.88$).

Bivariate Analyses

Family SES at age 4 was positively correlated with observed maternal supportive presence at age 4, as well as with both facets of emotion knowledge at ages 4 and 8. Child verbal IQ was positively related to both facets of emotion knowledge at ages 4 and 8 but negatively related to both externalizing and internalizing problems at ages 4 and 10. Maternal supportive presence at age 4 was positively related to both facets of emotion knowledge at ages 4 and 8, as well as to fewer externalizing problems at age 4 and fewer internalizing problems at age 10. Emotion recognition and labeling showed significant stability from ages 4 to 8. Emotion recognition and labeling at age 4 were negatively correlated with concurrent externalizing and internalizing problems, as well as with externalizing, but not internalizing problems, at age 10. Emotion recognition and labeling at age 8 were negatively related

Table 1
Descriptive Statistics and Correlations Among Study Variables

Study variable	1	2	3	4	5	6	7	8	9	10	11
1. Family SES (age 4)	—										
2. Child Verbal IQ (age 4)	.190**	—									
3. Maternal Support (age 4)	.181**	.109	—								
4. Emotion Recognition (age 4)	.195**	.524**	.196**	—							
5. Emotion Labeling (age 4)	.145*	.461**	.208**	.677**	—						
6. Emotion Recognition (age 8)	.220**	.242**	.197**	.304**	.290**	—					
7. Emotion Labeling (age 8)	.262**	.310**	.262**	.338**	.342**	.717**	—				
8. Externalizing Problems (age 4)	−.101	−.157*	−.254**	−.256**	−.295**	−.216**	−.295**	—			
9. Internalizing Problems (age 4)	−.087	−.349**	−.022	−.305**	−.297**	−.332**	−.243**	.347**	—		
10. Externalizing Problems (age 10)	−.068	−.170*	−.131	−.197**	−.251**	−.267**	−.379**	.370**	.041	—	
11. Internalizing Problems (age 10)	−.114	−.210**	−.153*	−.125	−.084	−.211**	−.280**	.045	.091	.330**	—
M (*SD*)	32.13 (12.14)	97.03 (15.32)	4.86 (.80)	1.30 (.26)	1.27 (.23)	1.86 (.14)	1.80 (.18)	17.05 (18.42)	8.31 (8.88)	8.10 (10.31)	6.27 (6.71)

Note. SES = socioeconomic status; IQ = intelligence quotient.
* $p < .05$. ** $p < .01$.

to both externalizing and internalizing problems at age 10. Finally, there were positive and concurrent associations between externalizing and internalizing problems at ages 4 and 10, but only externalizing problems showed significant stability from ages 4 to 10.

Path Analyses

Table 2 depicts parameter estimates for the proposed multiple mediation model with 95% bootstrapped confidence intervals (CIs) across 10,000 resamples. The model explained 19% of the variance in externalizing problems, which constitutes a medium effect (f^2 = 0.230), and 11% of the variance in internalizing problems, which constitutes a small effect ($f^2 = 0.120$). Family SES and child verbal IQ predicted increased levels of emotion labeling from ages 4 to 8. Maternal supportive presence predicted significant gains in children's emotion recognition and labeling from ages 4 to 8. However, only emotion labeling was related to children's behavioral adjustment showing significant negative predictions to externalizing and internalizing problems at age 10. As shown in Figure 1, the multiple mediation analysis revealed a significant indirect path from maternal supportive presence at age 4 to decreased externalizing and internalizing problems from ages 4 to 10 via gains in children's emotion labeling from ages 4 to 8. Follow-up multigroup comparisons between fully freed and fully constrained models revealed no significant differences in the obtained pathways between girls and boys, $\Delta\chi^2(2) = 7.921$, $p = .313$, nor between Latina and non-Latina mothers, $\Delta\chi^2(2) = 2.047$, $p = .450$.

Sensitivity Analysis

A sensitivity analysis evaluated the proposed mediation model using only the 169 cases with complete data. This analysis replicated our initial findings with the full sample showing that emotion labeling mediated relations from maternal supportive presence to reduced externalizing ($B = -0.782$, $SE = 0.436$, 95% CI [−1.928, −0.109], $p = .073$) and internalizing ($B = -0.287$, $SE = 0.187$, 95% CI [−0.667, 0.006], $p = .124$) problems, albeit at marginal levels of significance due to the reduced sample size and statistical power.

Discussion

This investigation evaluated a multiple mediation model from observations of maternal supportive presence in early childhood at age 4 to externalizing and internalizing behavior problems at age 10, through children's recognition and labeling of emotions during middle childhood at age 8. Moreover, multigroup path analyses tested these effects by child sex assigned at birth (i.e., girls vs. boys) and maternal ethnicity (i.e., Latina vs. non-Latina).

Positive relations from maternal supportive presence during the preschool period to increased emotion recognition and labeling skills across childhood replicate prior studies showing promotive relations between positive parenting during early childhood and later emotion knowledge (Pintar Breen et al., 2018; Raikes & Thompson, 2006). However, building on prior studies of specific emotion socialization practices as related to global emotion knowledge measures, the present study examined relations between a broader index of supportive parenting and individual facets of children's emotion recognition and labeling skills. As expected, maternal supportive

Table 2

Indirect Effects of Child Externalizing and Internalizing Problems on Maternal Supportive Presence Through Emotion Recognition and Labeling (N = 250)

Effect	*B*	Boot-strapped *SE*	95% CI bias corrected *LL*	95% CI bias corrected *UL*
Covariates				
Family SES → Emotion Recognition (age 8)	.006	.003	−.001	.012
Family SES → Emotion Labeling (age 8)	.001	.002	.002	.006
Family SES → Externalizing problems (age 10)	.021	.051	−.081	.117
Family SES → Internalizing problems (age 10)	−.016	.036	−.083	.058
Child Verbal IQ → Emotion Recognition (age 8)	.002	.001	−.001	.003
Child Verbal IQ → Emotion Labeling (age 8)	.001	.002	−.001	.006
Child Verbal IQ → Externalizing problems (age 10)	−.011	.061	−.136	.100
Child Verbal IQ → Internalizing problems (age 10)	−.071	.043	−.154	.013
Predictors				
Maternal Support (age 4) → Emotion Recognition (age 8)	.030	.013	.005	.056
Maternal Support (age 4) → Emotion Labeling (age 8)	.042	.017	.010	.076
Emotion Recognition (age 8) → Externalizing problems (age 10)	2.765	4.762	−6.019	12.603
Emotion Labeling (age 8) → Externalizing problems (age 10)	−18.026	6.789	−31.770	−5.218
Emotion Recognition (age 8) → Internalizing problems (age 10)	−2.769	2.559	−7.519	2.607
Emotion Labeling (age 8) → Internalizing problems (age 10)	−7.023	3.110	−13.351	−1.132
Direct effects				
Maternal Support (age 4) → Externalizing problems (age 10)	.279	.995	−1.749	2.187
Maternal Support (age 4) → Internalizing problems (age 10)	−.756	.591	−1.962	.370
Indirect effects of maternal support (age 4) to externalizing problems (age 10) via				
Emotion Recognition (age 8)	.083	.160	−.201	.458
Emotion Labeling (age 8)	−.761	.393	−1.632	−.120
Indirect effects of maternal support (age 4) to internalizing problems (age 10) via				
Emotion Recognition (age 8)	−.083	.090	−.287	.078
Emotion Labeling (age 8)	−.297	.184	−.729	−.019

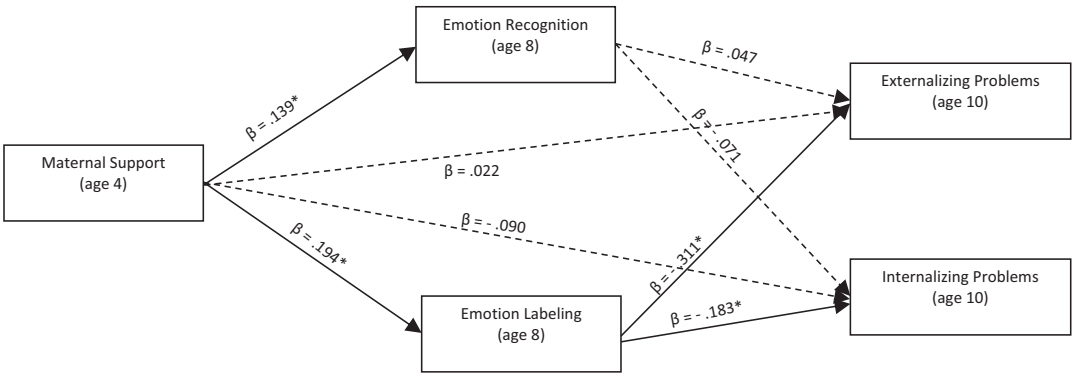
$R^2_{\text{externalizing}} = 0.187$; Cohen's $f^2_{\text{externalizing}} = 0.230$
$R^2_{\text{internalizing}} = 0.107$; Cohen's $f^2_{\text{internalizing}} = 0.120$

Note. *SE* and CI are bias-corrected based on 10,000 samples. *SE* = standard error; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; SES = Socioeconomic status; IQ = intelligence quotient.

presence was more strongly related to children's emotion labeling than recognition skills. Children's capacities to label emotions may be especially dependent on early and supportive scaffolding in the parent–child relationship because they call upon later-developing expressive language abilities and semantic knowledge of labels for emotions (Harrigan, 1984). Parents who can anticipate and attend to their child's emotion signals provide a foundation for children's developing capacities to recognize and label emotions (Denham et al.,

Figure 1

Path Analysis Depicting the Contribution of Maternal Supportive Presence at Age 4 to Children's Externalizing and Internalizing Problems at Age 10 Through Emotion Recognition and Labeling Skills at Age 8 (N = 250)



Note. Solid lines depict significant pathways. Covariates (i.e., family SES, child verbal IQ, prior emotion recognition and labeling, and prior behavior problems) not shown for clarity. SES = socioeconomic status; IQ = intelligence quotient.
* $p < .05$.

2000) because they support children's mentalization skills (Fonagy et al., 1991) and instill them with confidence and capacities not only to manage their own emotions but also to recognize and respond to the emotions of others (Cassidy, 1994; Sroufe, 1996). In turn, emotion knowledge skills provide children with critical information to navigate challenging social situations by helping them know when it is appropriate to express their own needs and how to tailor those expressions to the demands of the social context and, ultimately, by supporting effective conflict resolution and other positive social behaviors (Dunn & Herrera, 1997), which promote healthy self-esteem and protect against the development of behavior problems (Henriksen et al., 2017).

Consistent with prior research highlighting the adaptive nature of emotion knowledge (Trentacosta & Fine, 2010), children's emotion labeling, but not recognition, skills predicted decreased behavior problems over time. This pattern is consistent with those of Ip et al. (2019) who found that a composite of preschoolers' emotion labeling and situation knowledge, but not a measure of emotion recognition, increased the likelihood that a child would show decreasing externalizing and internalizing problems across childhood (ages 3–10). As compared to other emotion knowledge facets, children's capacities to correctly label emotions may be especially important for self-regulation (Halberstadt et al., 2001). In this view, a child who can effectively verbalize their feelings may be better equipped to communicate their needs in ways that garner the support they need to avoid reactive responses that undermine social functioning (Lemerise & Arsenio, 2000).

Halberstadt et al.'s (2001) affective social competence model holds that children's acquisition and integration of emotional, cognitive, and social skills in the context of effective parenting practices, such as warmth, support, and appropriate discipline, can reduce externalizing and internalizing behaviors and promote positive social outcomes. Consistent with this model, the present study found a significant indirect pathway from maternal support to decreased externalizing and internalizing behavior problems through children's improved capacities to label emotions. This finding extends prior mediation studies with preschoolers (S. F. Thompson et al., 2020) and adolescents (Cunningham et al., 2009) to document the salience of emotion labeling within childhood for understanding relations between parenting and child behavior outcomes.

The absence of significant differences in prospective relations among maternal support, emotion knowledge, and child behavior problems by child sex assigned at birth and maternal ethnicity was somewhat surprising. One explanation for these more universal effects may be attributed to the current focus on generally supportive parenting practices, rather than on those specific to emotion socialization, which have been shown to be especially salient for boys (Martin & Green, 2005). Additionally, the emphasis was not on negative parenting practices, such as intrusiveness, which might be less harmful for Latine children (Ispa et al., 2004; Ruiz-Ortiz et al., 2017). However, further research on emotion-specific parenting effects, such as the frequency, intensity, or form of parents' expressed emotion directed at the child, may reveal meaningful ethnic and racial differences, as suggested by prior studies (Ispa et al., 2004; Ruiz-Ortiz et al., 2017). Indeed, these prior studies suggest that further research on emotion-specific parenting effects, such as the frequency, intensity, or form of parents' expressed emotion directed at the child, may reveal meaningful ethnic and racial differences. It is also possible that significant differences by ethnicity and race were occluded by the necessary merging of multiple ethnic and racial groups into one non-Latina category due to the relatively small single-group sample sizes in this study.

Strengths and Limitations

This study advanced our understanding of the development and implications of children's emotion knowledge across the transition to formal schooling as related to the contribution of maternal supportive presence in the preschool period to later child behavior outcomes. The present study featured several strengths, including a longitudinal research design with a large and sociodemographically diverse community sample. Further, our use of multiple informants (i.e., examiners, children) and methods (e.g., observational, standardized assessment) while controlling for prior levels of each study construct reduced common-method variance and supported directional inferences.

Despite these strengths, several limitations should be considered when interpreting these findings. For example, notwithstanding the benefits of our longitudinal design, a fully cross-lagged model with measures of all study constructs at all time points would have supported a more thoroughgoing evaluation of hypothesized cascades from parenting to emotion knowledge to child behavior problems. Additionally, although the study employed a multi-informant design, incorporating additional informant perspectives, such as those from peers, parents, and teachers, would have best captured children's expression of behavior problems in varied settings. Moreover, it is important to recognize that the CIs surrounding the indirect effect parameters in this study were close to encompassing zero. Thus, the current findings should be interpreted with caution until future studies both confirm and expand upon these preliminary results.

Research Implications

This investigation sought to bridge attachment studies of parenting and adaptation with emotion science studies of emotion knowledge and adaptation to inform future research pursuits in both traditions. First, while the present study queried one model of emotion knowledge based on recognition and labeling, other emotion knowledge facets may be relevant, particularly in later development and in culturally diverse contexts. For example, situation knowledge, which captures understanding emotion as a causal process (Ackerman & Izard, 2004; Izard, 2011), is a key component of emotion understanding that encompasses important pieces of information, such as culturally embedded scripts about emotion-eliciting situations (e.g., Garrett-Peters et al., 2017). Situation knowledge takes on increasing significance during middle childhood and adolescence as both emotion processing capacities and social demands for apprehending situational influences increase (Pons & Harris, 2005). Thus, this facet of emotion knowledge warrants careful consideration in future research.

Second, emotion recognition and labeling may vary meaningfully by hedonic valence, which refers to the pleasantness or unpleasantness of an emotion (Kauschke et al., 2019). Hedonic valence is central to the representation, and categorization of emotion experiences

(Cooper et al., 2020) of specific emotion subtypes (e.g., positive vs. negative) may be important. For example, as compared to nonclinical controls, 13-year-olds diagnosed with major depressive disorder or dysthymia showed poorer recognition of negative emotions (i.e., fear, disgust), but they did not differ significantly in their capacity to recognize positive emotions (i.e., happiness, surprise; Lenti et al., 2000). In the future, research should investigate whether parenting practices differentially shape children's abilities to recognize and label positive versus negative emotions, as well as the unique implications of each for understanding children's socioemotional adaptation.

Third, an important assumption in this study is that semistructured laboratory observations of parenting reflect naturalistic expressions of parenting outside the laboratory. In future research, home- and community-based observations may better capture parent–child interactions in everyday life because the setting is more representative of the child's typical environment and subject to less of the reactivity effects associated with laboratory observations. Although prior studies support the validity of observations of maternal support and discipline across home and laboratory settings (e.g., Bornstein et al., 2006; van der Mark et al., 2002), some data suggest that the consistency of parenting may be weaker for ethnic and racial minority families compared to White families across laboratory and home settings (Abels et al., 2017; Lamm et al., 2014). Lab-based observations can be intimidating and uncomfortable for families, especially those from minoritized ethnic or racial backgrounds and lower socioeconomic households who may be less familiar with lab- and university-based settings. Although the diverse ethnic and racial composition of the examiners in this study (i.e., 80% non-White) may have mitigated some of these concerns, future studies on parenting and children's emotion knowledge should consider home- and community-based observational methods to obtain more accurate and representative observations of parent–child interactions. It is also important to note that the current assessments and coding schemes were initially developed in majority White samples. Thus, though they have since been validated for use with other ethnic and racial groups, the potential for cultural bias remains a point of consideration when interpreting the current findings, particularly in the context of our lab-based setting, which may have influenced the quality of parent–child interactions and children's testing performance and behavior to varying degrees across sociodemographic groups.

Translational Implications

The current findings have several implications for practice within both attachment and emotion science traditions. First, this study illustrated the promotive effects of supportive parenting on both emotion knowledge and child behavior, which encourages continued efforts to promote positive and supportive parenting. To that end, both the Triple-P Positive Parenting Program (Sanders & Sanders, 1999) and the Circle of Security (Powell et al., 2013) are attachment-based interventions that enhance parents' confidence, knowledge, and skills by helping parents build a warm and responsive relationship with their child, particularly in stress-inducing situations.

Second, the explanatory potential of emotion labeling skill, underlying pathways from supportive parenting to child behavior outcomes, underscores the value of initiatives aimed at enhancing children's emotion knowledge (Denham & Burton, 2003). For example, the Emotion-Based Prevention Program developed by C. E. Izard et al. (2008) is an emotion-focused intervention that teaches children not only to identify and label emotions but also to understand how emotions relate to behavior. Evidence from a multiyear trial established that this intervention effectively reduces children's problem behaviors via long-lasting gains in their emotion knowledge skills (Finlon et al., 2015; C. E. Izard et al., 2008).

Third, and perhaps most importantly, these findings speak to the potential for synergistic value in integrative efforts that target parent-child attachment and emotion processes to prevent or reduce child behavior problems at the level of the child, the parent, and the relationship. For example, Havighurst et al. (2010) developed the Tuning into Kids Program as a parenting intervention aimed at improving emotion communication and regulation between parents and their 4- and 5-year-old children. The program teaches parents to identify and accept their own emotions, discuss emotion experiences with their child using emotion labels, and develop empathy toward both positive and negative emotions in their children, with the goal of reducing dismissive parenting and enhancing emotion-coaching practices. These and future integrative programs may be effective in preventing or reducing problematic behaviors during a crucial developmental period when emotional and behavioral difficulties codevelop in ways that widen pathways to psychopathology in later development.

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