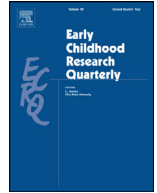




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# Challenging parenting behavior in ethnically diverse two-parent families in the United States: Association with infants' social competence and behavior problems

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## ABSTRACT

We used data from a sample of ethnically diverse first-time parents ( $N = 186$ ) in the United States to examine differences between mothers' and fathers' challenging parenting behavior (CPB) when infants were 9 months old as well as covariates of CPB. We also examined associations between CPB and infants' social competence and behavior problems when they were 12 months old. Results showed no differences between mothers and fathers in the level of CPB with their infants. Mothers with more depressive symptoms engaged in more CPB. Over and above the contributions of infants' gender and temperament and parents' education, mothers' and fathers' CPB was not associated with infants' social competence and behavior problems. This study expands our understanding of the universality of CPB and whether it is associated with social competence in ethnically diverse families.

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## 1. Introduction

There is considerable evidence that children's social and emotional development, that is, children's ability to experience, express, and manage emotions and establish positive and rewarding relationships with others, occurs in the context of parenting interactions (Ainsworth et al., 1978; Blair & Perry, 2019; Cabrera et al., 2007; Ding et al., 2020; Fraley et al., 2013). Developmental theory contends that everyday experiences with parents are fundamental to a child's developing social skill-set (Bornstein, 2005). Of the everyday parent-child interactions linked to social and emotional development, maternal sensitivity, that is, mothers' timely and developmentally appropriate responses to their infants' cues, is one of the most investigated.

But less attention has been given to other parenting behaviors, especially behaviors more predominantly observed among fathers, that also promote children's positive social and emotional development (Cabrera et al., 2018; van IJzendoorn, 2019). Although there are similarities between mother-child and father-child inter-

actions, there are also differences in both the quantity and quality of interactions (Cabrera et al., 2014). For instance, activation relationship theory proposes that vigorous, physical play is more central to father-child interactions than it is to mother-child interactions (Paquette, 2004; Paquette et al., 2020). Indeed, fathers are expected to engage in physical play, which in turn promotes social and emotional development (Fletcher et al., 2013). Based on this line of inquiry, Majdandžić and colleagues (2016) hypothesized that parents challenge and encourage children to explore and act in ways that lie beyond their comfort zone (coined *challenging parenting behavior*, CPB), which promotes social and emotional development, more broadly. Children whose parents encourage and stimulate them in a playful way to move out of their comfort zone are thought to become more assertive and confident in social interactions (Majdandžić et al., 2016; Paquette, 2004). Being assertive and confident in the context of social interactions enables children to form and maintain relationships with others and regulate their emotions and behavior, a marker of socially and emotionally competent children (Flanders et al., 2010; StGeorge & Freeman, 2017). In line with this work, theories on physical play propose that CPB-like behaviors such as rough-and-tumble play (RTP) support the development of social, affective, and regulative competencies (Carson et al., 1993). The empirical evidence supporting

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associations between CPB and children's social adaptation has been primarily conducted with White middle-class European samples, and focused on anxiety. Some studies find that fathers' CPB, but not mothers' CPB, is related to less child anxiety (Majdandžić et al., 2014; Möller et al., 2015). But, other studies find main effects for both parents (Lazarus et al., 2016), as well as interaction effects, such that one parent with high levels of CPB can compensate for low levels of CPB in the other parent (Majdandžić et al., 2018a).

We extend Majdandžić and colleagues' work on CPB in two ways. First, we test whether CPB, as predicted by theory, is related to aspects of social development other than anxiety. In this paper, we focus on social competence (sustaining attention, compliance, prosocial peer relations) and behavior problems because these are critical aspects of social development among toddlers that underlie later behavior in childhood (Odom et al., 2008). Second, we examine CPB in a more ethnically and economically diverse sample than the samples tested in the Majdandžić studies. Our sample includes Latinx and Black economically diverse families from the United States whose education ranges from less than high school to at least some college. Research shows that cultural context is an important determinant of parenting and that there are universal (e.g., parent sensitivity during interactions, love, play) and culture-specific aspects of parenting behavior that reflect the cultural norms and values of specific groups (Bornstein & Lansford, 2010; Lansford et al., 2018). A parenting behavior such as play is considered to be universal across cultures, but the expression, intensity, and quality of play might vary (Tamis-LeMonda et al., 2002). Based on cultural theories, we test whether CPB is also observed in ethnically and economically diverse U.S. families and if it is, then we identify what the sources are of variability in these fathers' and mothers' CPB. We do not make a prediction one way or another because this study is, to our knowledge, the first to study CPB in this type of families.

The current study draws on activation relationship and family systems theories to ask: (a) Is CPB observed in an ethnically and economically diverse sample of mothers and fathers? and, if it is, are there differences by parent gender? (b) What family- and individual-level factors are associated with maternal and paternal CPB? (c) Are maternal and paternal CPB at 9 months associated with infants' social competence and behavior problems at 12 months? and (d) Is the association between the CPB of one parent and infants' social competence and behavior problems moderated by the CPB of the other parent?

### 1.1. Challenging parenting behavior among fathers and mothers

Activation relationship theory proposes that children can explore their environment with confidence and adhere to parental limits when they are "activated" by their fathers (Paquette, 2004). Fathers "activate" children through a combination of behaviors that include cognitive stimulation, being in close contact to the child, being intrusive, and showing low levels of detachment (Stevenson & Crnic, 2013). Based on Paquette's work, but acknowledging that mothers are also capable of activating their children, Majdandžić and colleagues (2016) hypothesized that parents can challenge children to explore and act in ways that lie beyond their comfort zone such that children are excited, surprised, and momentarily destabilized (coined *challenging parenting behavior*; CPB). CPB thus involves active parental encouragement of children to push their limits and go outside their comfort zone (Majdandžić et al., 2018a). This type of parental engagement is hypothesized to help children be more assertive and confident in interactions with others (Majdandžić et al., 2018a). Accordingly, CPB includes a host of physical, socio-emotional, and verbal play behaviors such as tickling, chasing, and verbal encouragement that foster risk-taking and confidence in children (Majdandžić et al., 2016).

As a construct, CPB is operationalized to assess parenting behaviors that are different and distinct from parental sensitivity or intrusiveness (Majdandžić et al., 2016). Parental sensitivity refers to the quality with which parents respond to their infants' cues in a timely and developmentally appropriate manner, thereby establishing a clear contingency between their infants' cues and their responses (Ainsworth, 1969). Extensive empirical evidence concludes that sensitivity among mothers and fathers is a construct distinct from other dimensions of parenting (e.g., Ainsworth et al., 1978; Blair & Perry, 2019; Cabrera et al., 2007; Ding et al., 2020; Fraley et al., 2013; Tamis-LeMonda et al., 2004). The key defining characteristic of a sensitive interaction is that it is child-centered; the parent discontinues an activity that is beyond the child's capacity for response (Cox & Crnic, 2003). In contrast, in a CPB type of interaction, the parent encourages the child to engage in an activity that may be beyond the child's capacity or to go outside their comfort zone (Majdandžić et al., 2016). In White middle-class families, CPB is moderately and positively associated with parental warmth, and negatively with dimensions of parental overprotection (Majdandžić et al., 2016; 2018a).

An intrusive, insensitive interaction is adult-centered and is evaluated from the perspective of the child (Cox & Crnic, 2003). Intrusive parents impose their agenda on the child despite the child's negative reaction (averts gaze, cries), do not allow the child a "turn" or an opportunity to respond at their pace, and appear unable to facilitate the child's exploration or regulation of the activity (Cox & Crnic, 2003). High arousal, vigorous physical interactions, or a rapid pace, are indicative of intrusive overstimulation if the child responds negatively (Cox & Crnic, 2003), but in contrast, the playful and encouraging nature of CPB theoretically results in the child responding positively with sustained interest, smiles, and laughter. Indeed, CPB is usually shown in playful, fun, warm interactions that remain child-centric, and CPB is positively correlated with warmth (Majdandžić et al., 2016). In a study of fathers and their children, Stevenson & Crnic (2013) found that "activating fathering" behaviors, which are similar to CPB behaviors, predicted children's dysregulation and sociability levels. However, a study where father intrusiveness was coded alongside the child's affective response found that when children reacted positively to "intrusive" paternal behavior, children exhibited increased regulation (Karberg et al., 2019). In sum, CPB is neither just sensitive or just intrusive parenting, but rather a distinct construct that taps into the ways in which parents encourage risk-taking in a playful and joyful way.

The question of whether fathers activate their children more than mothers is rooted in evolutionary theory which suggests that the father's role in the family is instrumental in teaching children to take risks that would ensure their survival (Paquette, 2004). This view has been challenged by scholars who argue that, in contemporary society, mothers and fathers share similar roles in the home and are both able to nurture their children as well as to challenge them or activate them (Cabrera et al., 2014; Roggman, 2004). There seems to be a consensus that while both mothers and fathers engage in similar behaviors, there may be stylistic differences (Cabrera et al., 2014). For example, research has shown that compared to mothers, fathers encourage more risk-taking behaviors (Power, 1981), engage more frequently in rough-and-tumble play (RTP; Fletcher et al., 2013), participate in more physical play with their children (Möller et al., 2013), and engage in higher levels of CPB with their toddlers (Lazarus et al., 2016). Other studies, however, have found no differences between parents' levels of CPB or activated parenting with infants and children in middle-class Dutch and American families (Majdandžić et al., 2016; Möller et al., 2015; Volling et al., 2019). Although activation theory (Paquette, 2004) hypothesizes that mothers and fathers should exhibit different levels of CPB, a study with 4- and 12-month-old

babies in White middle-class families found no difference between parents (Majdandžić et al., 2016). Based on this evidence, we test whether there are differences in CPB between fathers and mothers in our sample of diverse US families, but we do not make specific predictions.

### 1.2. Determinants of challenging parenting behavior

According to process and dynamic models of parenting, parenting is multiply determined and is influenced by characteristics of three subsystems: parent, child, and social context (Belsky, 1984; Cabrera et al., 2014). Predictors of parenting behaviors are complex and interactive, and the predictors of mothers' and fathers' parenting differ in important ways (Cabrera et al., 2014). Of the three subsystems in Belsky's (1984) model, empirical evidence suggests that the characteristics of the parent are most important because parents are the most proximal influence on children's development (Bronfenbrenner, 1995).

Of the parent-level predictors, parents' psychopathology is the most studied, especially among mothers, and is one of the most important predictors of parenting behaviors (Badovinac et al., 2018; Goodman, 2007; Goodman et al., 2011). There are several theoretical perspectives linking depression to less sensitive and more harsh parenting in mothers and fathers (Lovejoy et al., 2000; Wilson & Durbin, 2010). Depressed parents may have compromised cognition, affect, and behavior, which can result in mothers' neglect of their children's social, cognitive, and physical needs (Coyne et al., 2007; Goodman, 2007; Lovejoy et al., 2000; Wilson & Durbin, 2010). Depressed parents may be intrusive or withdraw from interactions with their children and may be unable to take their children's perspective into account, resulting in less sensitive parenting (Coyne et al., 2007). A meta-analysis of 21 independent effect sizes found a small negative association between positive parenting (e.g., warm, affectionate, sensitive, and supportive) and paternal depression ( $r = -0.19$ ; Wilson & Durbin, 2010). In a study of African American and Latino fathers, paternal depressive symptoms predicted less physical play for African American fathers, but not for Latino fathers (Cabrera et al., 2011). Because the construct of CPB also includes some level of physical activity, it is possible that fathers who are depressed might also engage in lower levels of CPB.

A very extensive literature has shown that parent resources such as education are strongly related to parental investments of time and money on their children (Bradley & Corwyn, 2002; Duncan & Magnuson, 2003; Guryan et al., 2008). A study of a United States national sample of babies and their parents found that more educated African American and Latino fathers participated in more verbal interactions (e.g., reading and singing songs) compared to fathers who are less educated (Cabrera et al., 2011). In this study, we test whether higher levels of education also predict whether low-income, ethnically diverse fathers and mothers engage in more CPB.

### 1.3. Challenging parenting behavior and children's social and emotional skills

The empirical evidence linking CPB to children's social and emotional development is just emerging and has primarily focused on anxiety. Survey studies with Dutch (Möller et al., 2015) and Australian families of infants and preschoolers (Lazarus et al., 2016; Majdandžić et al., 2018b) found a negative association between parents' CPB and children's anxiety, except for Dutch mothers of infants. A longitudinal observational study of Dutch families found that paternal CPB was linked to decreased social behavioral inhibition, whereas mothers' CPB was associated with increased behavioral inhibition in 4-year-old children (Majdandžić et al., 2014).

Among the 2-year-old siblings of the study participants, neither of the parents' CPB influenced anxiety development. In a later study, Majdandžić and colleagues found that both fathers' and mothers' CPB predicted less child anxiety, but the relation was stronger for fathers (Majdandžić et al., 2018a).

In addition, Majdandžić and colleagues (2018a) found evidence for an interaction effect of mothers' and fathers' CPB (compensatory hypothesis): higher levels of CPB predicted less anxiety in children when one parent showed lower CPB. Such findings of independent influences as well as joint and interactive influences of parents provide a clearer understanding of child development as embedded within a multitude of connected systems (Cowan & Cowan, 2019). Collectively, these findings support the hypothesis that higher levels of fathers' CPB may be related to positive social adjustment in children, but research on positive outcomes other than reduced anxiety, and in parents of ethnically and socio-economically diverse backgrounds, is lacking.

Because physical play is an important component of CPB, research linking play to children's social skills is also relevant here. Across ethnic groups, playful parenting by mothers and fathers can improve children's ability to regulate their emotions as well as develop self-efficacy, which may promote more positive peer interactions and lower behavior problems (Cabrera et al., 2017a; Isley, O'Neil, Clatfelter, & Parke, 1999; Menashe-Grinberg & Atzaba-Poria, 2017; Paquette, 2004). A study of Israeli mothers, fathers, and children (aged 1 to 3 years) found that mothers and fathers who were higher in playfulness had children with lower negativity (i.e., negative affect, non-compliance; Menashe-Grinberg & Atzaba-Poria, 2017). A meta-analysis of 16 studies on father-child RTP spanning over 30 years and focused on middle-class White samples found weak to moderate associations between father-child physical play and child aggression, social competence, emotion skills, and self-regulation abilities (StGeorge & Freeman, 2017). Engaging in physical play such as RTP which is fun and enjoyable teaches children boundaries, turn-taking, and to consider the feelings of others.

Overall, these findings of independent and interactive associations between CPB and children's social and emotional outcomes provide a clearer understanding of child development as embedded within a multitude of connected systems (Cowan & Cowan, 2019). Collectively, these findings support the hypothesis that higher levels of parents' CPB may be related to positive social and emotional outcomes in children, but research on outcomes other than reduced anxiety, and in parents of ethnically and socio-economically diverse backgrounds is lacking. Based on this review, we test whether parents' CPB is associated with better social competence (assessed as parental reports of children's sustained attention, compliance, and prosocial peer behaviors during social interactions), and fewer behavior problems (assessed in terms of parental report of aggressive behavior, negative emotionality, and sleeping difficulty) in infancy.

### 1.4. The current study

The current study extends the literature by asking: (1) Do ethnically and socio-economically diverse fathers and mothers in the United States engage in CPB with their 9-month-old infant, like previously found in middle-class White families, and are there differences in levels of CPB between these mothers and fathers? (2) Are parents' levels of education and parents' depressive symptoms when their child is 9 months related to maternal and paternal CPB at 9 months? (3) Are mothers' and fathers' CPB at 9 months associated with children's increased social competence and decreased behavior problems at 12 months (main effects) controlling for infants' gender and temperament, and parents' depressive symptoms and education? and (4) Is the association between one parent's

CPB and children's positive social adjustment moderated by the other parent's CPB (interaction hypothesis)? Given the mixed findings regarding differences between parents in levels of CPB, we merely explore differences in CPB between mothers and fathers. We hypothesize that parents with higher levels of education and fewer depressive symptoms, and with children of a less difficult temperament, engage in higher levels of CPB than their counterparts. We also hypothesize that mothers and fathers showing higher levels of CPB have infants with fewer behavior problems and higher social competence (main effect hypothesis) and that this association is stronger when both parents engage in high levels of CPB, instead of one parent (interaction hypothesis).

## 2. Method

### 2.1. Participants

The sample for this study is drawn from an ongoing NIH-funded intervention (Baby Books 2 [BB2]) for low-income parents ((Cabrera et al., 2017b). The BB2 project is a randomized controlled trial in which families received baby books embedded with anticipatory guidance. After their participation in the first time-point when infants were 9-months old, families were divided into four study conditions: both parents receive study baby books, only mothers receive study baby books, only fathers receive study baby books, and both parents receive a standard baby book. We therefore controlled for condition in the analyses that used 12-month outcome data. Participants were recruited at various community locations, including local daycares, farmers' markets, and health-care centers. Parents were eligible for the project if they were over 17 years of age, first-time parents of a 6- to 9-month-old infant, in a co-resident relationship with their partner, and able to read at a first grade level in English or Spanish. Data were collected between 2016 and 2021 at two sites in the U.S.: Orange County, California and Washington, DC. The project includes eight waves of data collection taking place through home visits (9, 18, 24, and 30 months) and phone calls (12, 15, 21, and 37–45 months). The current study used observational and questionnaire data from the first two waves, when children were 9 and 12 months old.

The BB2 sample consisted of  $N = 210$  9-month-old infants and their mothers and fathers. Of these families, 24 were missing data on the CPB variables for one of the two parents. Our analytic sample thus included the  $n = 186$  families with all data on the CPB variables. These data on CPB were missing for three main reasons: (a) the parent-infant dyad did not participate in the no-toy interaction; (b) the infant became too fussy and forced an early stop to the no-toy interaction; or (c) the parent asked to end the no-toy interaction early. A comparison of families who had complete data on CPB ( $n = 186$ ) and those with incomplete data ( $n = 24$ ) showed no systematic differences on key socio-demographic variables: infant gender ( $\chi^2 [210] = 0.005, p = 0.95$ ), household income ( $F[1, 206] = 0.84, p = 0.36$ ), maternal education ( $F[1, 208] = 0.36, p = 0.55$ ), paternal education ( $F[1, 208] = 0.03, p = 0.86$ ), maternal ethnicity ( $\chi^2 [210] = 1.83, p = 0.40$ ), and paternal ethnicity ( $\chi^2 [210] = 3.42, p = 0.18$ ).

The analytic sample of  $n = 186$  9-month-old infants (51.1% girls) included their mothers and fathers. When infants were 12 months old, parents completed a follow-up interview at the second wave of the study. Parents were ethnically diverse, with a majority identifying as Hispanic/Latinx or African American/Black (see descriptive statistics in Table 1). Parents reported a wide range of education and household income (see Table 1). In terms of household annual income, 19% reported less than \$10,000 and up to \$20,000; 16% between \$20,001 and \$30,000; 358% between \$30,001 and \$50,000; 27% between \$50,001 and \$75,000. Thus, the sample can be considered economically diverse.

### 2.2. Procedure

When infants were 9 months old, research assistants visited the participating families in their homes at a convenient time in which both fathers and mothers were present and available. The home visits lasted 2.5 hours on average and fathers and mothers completed two independent assessments in a counterbalanced order: (a) an English or Spanish interview during which they answered a series of questionnaires, including socio-demographic questions and a questionnaire on their depressive symptoms and (b) a series of interaction paradigms with their infant, including a 5-minute no-toy play interaction during which parents were asked to play how they normally would with their infant, but without using any toys. A team of coders assessed CPB from the no-toy play interactions, and an independent team of other coders evaluated responsive and intrusive parenting from these interactions.

When infants were 12 months old, a research assistant scheduled a 30-minute phone interview with each parent (independently) for a follow-up questionnaire assessment in English or Spanish, as preferred by the parents. Parents responded to a number of questions including questions about their infant's temperament, social competence and behavior problems.

Participants each received \$50 in compensation for their time for each home visit, baby books, and \$20 each for the phone call interview. All procedures and methods of the study received approval by the review boards at both institutions affiliated with the project.

### 2.3. Measures

#### 2.3.1. Infants' social competence and behavior problems (12 months)

Mothers and fathers reported on their infant's social competence and behavior problems by completing the Brief Infant Social Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006) when their infant was 12 months of age. The BITSEA comprises 42 items that are rated on a 3-point scale ranging from 0 (Not true/rarely) to 2 (Very true/often) pertaining to infants' behaviors. The social competence scale is comprised of 11 items asking parents to report on children's sustained attention (e.g., "Is restless and can't sit still"), compliance (e.g., "Follows rules"), and prosocial peer relations (e.g., "Plays well with other children [not including a sibling]"). The behavior problem scale consists of 31 items that assess externalizing and internalizing problems (e.g., aggressivity, anxiety) as well as dysregulated and maladaptive behaviors (e.g., negative emotionality, sleeping difficulty). Higher scores indicate more social competence and more behavior problems. The BITSEA presents adequate reliability and validity with low-income African American (Cabrera & Mitchell, 2009) and low-income Hispanic families (Hungerford et al., 2015). The current study relied on an average score of mothers and fathers' scores on each subscale for three reasons: (a) to reduce the bias associated with a single assessor; (b) to reduce the number of analyses; and (c) to account for the moderate and significant correlation between mothers' and fathers' reports (social competence:  $r = 0.39, p < 0.001$ ; behavior problems:  $r = 0.37, p < 0.001$ ).

#### 2.3.2. Challenging parenting behavior (9 months)

The CPB scales include two observational scales that rate how parents encourage their infant to exhibit risky behavior in a playful manner through (a) physical and (b) verbal means (Majdandžić et al., 2016). Examples of physical CPB include rough-and-tumble play, tickling, throwing the infant in the air, etc. In addition, clear physical encouragement for the infant to stand or to walk are considered physical CPB when coding with infants who cannot do this independently yet. Verbal CPB includes making verbal encouragements for the child to do something difficult, making challeng-

**Table 1**  
Descriptive statistics of participants and study variables.

Parent Variable	Mothers		M (SD)	Range	Fathers		M (SD)	Range
	n	%			n	%		
<i>Socio-demographic information</i>								
Age			27.6 (5.6)	18–44			30.2 (6.8)	18–53
Education (yr)			13.43 (2.24)	4–20			12.48 (2.62)	5–24
Less than high school	56	30.1			92	50		
High school degree	27	14.5			14	7		
At least some college	101	54.3			80	43		
Missing	2	1.1			-	-		
<i>Ethnicity</i>								
African American/Black	26	14			25	13		
Asian/Asian American	7	4			9	5		
Hispanic/Latinx	124	66			128	69		
Middle Eastern	1	1			1	1		
Multiracial	10	5			4	2		
Native Hawaiian/Pacific Islander	1	1			-	-		
Other	3	2			2	1		
White	14	7			17	9		
<i>Language</i>								
English	23	12			33	18		
Spanish	27	15			17	9		
Bilingual: English/Spanish	111	60			113	61		
Bilingual: English/Other	23	12			14	7		
Multilingual (2+ languages)	2	1			9	5		
<i>Parent variables</i>								
Challenging parenting behavior			2.48 (0.59)	1–4.8			2.51 (0.64)	1–4.2
Depressive symptoms			5.63 (4.55)	0–22			4.76 (3.88)	0–16
<i>Other parenting constructs</i>								
Intrusiveness			1.70 (0.84)	1–4			1.64 (0.77)	1–4
Responsiveness			3.45 (0.75)	2–5			3.20 (0.70)	1–5
<i>Children</i>								
<i>Child variables</i>								
Gender (girls)	95	51						
Difficult temperament (12 mo)			34.9 (7.64)	19.5–56				
<i>Social adaptation (12 mo)</i>								
Social competence			15.62 (2.73)	7–21				
Behavior problems			11.49 (5.27)	1.5–29				

ing and supportive sounds that increase tension in the game (e.g., loud grunting or growling, “woah”), and challenging the child cognitively. Physical and verbal CPB frequently co-occur (e.g., throwing the infant in the air while also saying “weeee!”). However, it is possible for parents to exhibit one of the two types of CPB at the time or to do so at different levels (e.g., making loud grunting noises while doing gentle tickles).

Challenging parenting behavior in the 5-minute no-toy play interaction were coded for each 1-minute interval of interaction, taking into account both the frequency and the intensity of the CPB (Majdandžić et al., 2016). For each minute, coders assigned a 1–5 score on both the physical and verbal scales as follows: 1 = no CPB, 2 = slight CPB, 3 = somewhat CPB, 4 = clear CPB, and 5 = clear and intense CPB. After coding, codes across each minute of the interaction were averaged into a global score of physical and a global score of verbal CPB for the task.

A team of two expert coders and seven student coders used video-recordings of the no-toy play interaction to rate parents' CPB on the 1–5 scale. The expert coders were trained by Dr. Majdandžić using a set of tapes from another study. Coders achieved reliability within 1-point of Dr. Majdandžić's codes on at least 90% of the tapes. The expert coders agreed on codes for 20 tapes from the BB2 study for the student intern training. The student intern coders received training from an expert coder and achieved reliability within 1-point of the expert coders' codes on at least 90% of the tapes. In addition, given that this study was the first to apply CPB to diverse, low-income families, coders double-coded 20% of the tapes (76 cases). These cases were divided equally based on parents' gender (mother or father), study site (California or Washington, D.C.), and spoken language during the interaction (English

or Spanish). Inter-rater reliability was excellent for physical CPB (ICC = 0.83) and good for verbal CPB (ICC = 0.70; Cicchetti, 1994). Coders were blind to all other study data. Consistent with past studies (e.g., Majdandžić et al., 2016), we averaged the physical and verbal CPB scales into a single CPB variable due to the high correlation between the scales (mothers:  $r = 0.72$ ,  $p < 0.001$ ; fathers:  $r = 0.62$ ,  $p < 0.001$ ).

### 2.3.3. Depressive symptoms (9 months)

Mothers and fathers reported on their depressive symptoms using the short form of the Center for Epidemiological Studies Depression (CES-D-10) symptoms index (Kohout et al., 1993). The short form CES-D-10 comprises 10 items that are rated on a 0 (Rarely) to 3 (All of the time) scale assessing different symptoms of depression (e.g., “I felt lonely,” “My sleep was restless”). The total score ranges from 0 to 30 on a continuous scale. The CES-D-10 possesses adequate reliability and validity to evaluate depressive symptoms in adult populations (Björgvinsson et al., 2013), including Hispanic (Grzywacz et al., 2006) and African American adults (Torres et al., 2012). The internal consistency in the current sample was excellent (mothers:  $\alpha = 0.99$ , fathers:  $\alpha = 0.99$ ).

### 2.3.4. Parental education (9 months)

Mothers and fathers reported on the number of years of education they had completed, and their highest academic degree earned. This continuous education score is used in analyses, but a categorical score (no high school diploma, high school diploma, at least some college) is also presented in the descriptive statistics for ease of interpretation.

### 2.3.5. Parental responsiveness and intrusiveness (9 months)

To compare CPB with other parenting constructs, we also measured parental responsiveness and intrusiveness during the no-toy play interaction (Cox & Crnic, 2003). Parents received a single score on each scale for the entire task. Scales were rated on a scale from 1 (Not at all characteristic) to 5 (Highly characteristic). An independent team of coders who were not involved in the coding of challenging parenting behavior coded the responsive and intrusive parenting behaviors. Six coders were responsible for coding these parenting behaviors. Coders were trained to 90% agreement by an expert coder on 10 “gold standard tapes” from a comparable, yet distinct sample. Coders were blind to all other study data.

### 2.3.6. Child difficult temperament (12 months)

Mothers and fathers reported on their infant’s temperament using the EAS Temperament Survey for Children: Parental Ratings (Buss & Plomin, 1984) during the phone interview at 12 months. The EAS Temperament Survey includes 20 items rated from 1 (Not characteristic or typical of your child) to 5 (Very characteristic or typical of your child). The instrument yields four scales (of five items each): shyness, emotionality, sociability, and activity. This instrument presents good psychometric properties (see Mathiesen & Tambs, 1999). For the current study, we added the scales negative emotionality and activity level to create a composite of “difficult temperament” (Bates, 1986). Mothers’ and fathers’ scores on the difficult temperament construct were correlated ( $r = 0.31, p < 0.001$ ), and we aggregated mothers’ and fathers’ ratings to obtain a measure of child difficult temperament.

## 2.4. Analytical strategy

Descriptive statistics, correlational analysis, and a path analysis were conducted using R (R Core Team, 2020) and the following packages: *irr* (Gamer et al., 2019), *lavaan* (Rosseeel, 2012), *psych* (Revelle, 2020), *tidyverse* (Wickham et al., 2019). Prior to the main analyses, variables that were not normally distributed were transformed to normalize them. Maternal CPB was transformed using a square root transformation. Intrusiveness and depressive symptoms for mothers and fathers, as well as behavior problems, were transformed using a logarithm transformation. These transformed scores were used in all analyses, except for the presentation of descriptive statistics and for the comparisons of mean levels of CPB across parents, which were computed with untransformed scores.

To address our first research question of differences in CPB between fathers and mothers, we used paired *t*-tests to make cross-parental comparisons. Before doing further analysis, we calculated correlations to examine the associations among parental sensitivity, intrusiveness, and CPB, as a complementary analysis. To address our second, third, and fourth research questions, we used a path analysis conducted using the R package *lavaan*. The path model used the FIML estimator to account for missing data on the 12-month variables (i.e., social competence, behavior problems, and temperament; 10.8% missing data). In the model, fathers’ and mothers’ CPB at 9 months predicted infants’ social competence and behavior problems at 12 months. The model included mothers’ and fathers’ CPB and their interaction term (mother CPB  $\times$  father CPB). To create the interaction terms, we first mean-centered mothers’ and fathers’ scores on CPB to reduce multicollinearity. The model also included parents’ depression and education as predictors of CPB and of the dependent variables. In order to isolate the association between CPB and the dependent variables (i.e., child social competence and behavior problems), the model controlled for study condition, infants’ difficult temperament, and child gender. Model fit was evaluated against Hu and Bentler, 1999 guidelines for model fit in small samples (<250), which were a comparative

fix index (CFI) above 0.90, and a standardised root mean square residual (SRMR) below 0.08.

## 3. Results

### 3.1. Descriptive analysis

Descriptive statistics for the study show that mothers ( $M = 2.48, SD = 0.59$ ) and fathers ( $M = 2.51, SD = 0.64$ ) in the sample engaged in CPB with their 9-month-old infant (See Table 1). A paired *t*-test revealed no significant differences in the levels of CPB between parents ( $t = -0.54, p = 0.59$ ). Correlation analyses (see Table 2) showed that mothers’ and fathers’ CPB were not correlated with one another ( $r = 0.09, p = 0.24$ ).

Before conducting our primary analysis, we conducted a correlational analysis to determine the degree of overlap between CPB and other parenting dimensions such as responsiveness and intrusiveness. Mothers’ CPB was significantly correlated with intrusiveness ( $r = 0.17^*, p < 0.05$ ), and responsiveness ( $r = 0.18, p < 0.05$ ). Fathers’ CPB was significantly correlated with responsiveness ( $r = 0.16, p < 0.05$ ), but not with intrusiveness ( $r = 0.14, p < 0.10$ ). Correlations were all modest, confirming that CPB is a unique construct, despite showing some associations with responsiveness and intrusiveness.

### 3.2. Path analysis

We tested a path model with the FIML estimator to examine (1) parental depressive symptoms and education as predictors of CPB and (2) the main and interactive effects of mothers’ and fathers’ CPB at 9 months on infants’ social competence and behavior problems at 12 months, controlling for study condition, infants’ gender, and difficult temperament (see Fig. 1). The model presented a good fit: CFI = 0.934, SRMR = 0.048.

In terms of the predictors of CPB, we found that for mothers, only maternal depressive symptoms ( $\beta = 0.19, p = 0.007$ ) were significantly associated with more CPB. In fathers, neither paternal depressive symptoms ( $\beta = -0.01, p = 0.85$ ) nor paternal education ( $\beta = 0.08, p = 0.26$ ) were associated with CPB.

Regarding the associations between CPB and children’s social competence, neither of the mothers’ CPB ( $\beta = 0.08, p = 0.25$ ) nor fathers’ CPB ( $\beta = -0.02, p = 0.83$ ) nor their interaction term ( $\beta = 0.02, p = 0.81$ ) were significantly associated with children’s social competence. None of our control variables were significantly associated with children’s social competence.

Similarly, in testing the association between CPB and behavior problems, we found that neither mothers’ ( $\beta = -0.02, p = 0.69$ ) nor fathers’ CPB ( $\beta = -0.07, p = 0.34$ ) nor the interaction term ( $\beta = -0.09, p = 0.22$ ) were significantly associated with children’s behavior problems. In terms of control variables, only higher paternal education was associated with lower behavior problems ( $\beta = -0.21, p = 0.005$ ) and a more difficult temperament with more behavior problems ( $\beta = 0.16, p = 0.034$ ).

## 4. Discussion

We examined the degree to which ethnic and socially diverse families in the United States engage in CPB with their infants and whether there were differences in the level of engagement between father and mothers. We also examined whether parents’ depressive symptoms and education predicted their level of CPB and tested for main and interaction effects between parents’ CPB at 9 months and infants’ social competence and behavior problems at 12 months. We found that mothers and fathers in our sample engaged in CPB at similar levels. Although education did not covary with parents’ CPB as expected, maternal depressive symptoms did,

**Table 2**  
Correlations between CPB and study variables.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. CPB M	-												
2. CPB F	0.09	-											
3. Responsiveness M	0.18*	0.14 <sup>†</sup>	-										
4. Intrusiveness M	0.17*	-0.11	-0.23**	-									
5. Responsiveness F	-0.07	0.16*	0.06	-0.04	-								
6. Intrusiveness F	0.05	0.14 <sup>†</sup>	0.05	0.24**	-0.16*	-							
7. Education M	0.04	0.03	0.06	-0.02	-0.04	0.15*	-						
8. Education F	0.06	0.08	0.15*	0.08	-0.08	0.17*	0.37***	-					
9. Depressive symptoms M	0.17*	0.01	-0.02	0.14 <sup>†</sup>	-0.06	0.07	-0.10	0.02	-				
10. Depressive symptoms F	0.20**	0.00	0.04	0.17*	-0.16*	0.04	-0.03	0.12	0.25***	-			
11. Child gender <sup>a</sup>	-0.08	0.05	0.05	0.03	-0.18*	0.04	-0.05	-0.11	0.09	0.01	-		
12. Child difficult temperament	0.10	-0.04	0.09	-0.05	-0.07	0.14 <sup>†</sup>	-0.01	0.07	0.13 <sup>†</sup>	0.17*	-0.09	-	
13. Child social competence	0.01	-0.02	0.18*	-0.01	0.01	-0.00	0.11	-0.07	-0.14 <sup>†</sup>	-0.08	0.09	-0.05	-
14. Child behavior problems	0.00	-0.11	-0.03	-0.16*	0.02	-0.06	-0.16*	-0.23**	0.10	0.12 <sup>†</sup>	-0.01	0.17*	-0.10

Note. CPB = challenging parenting behavior, F = father, M = mother.

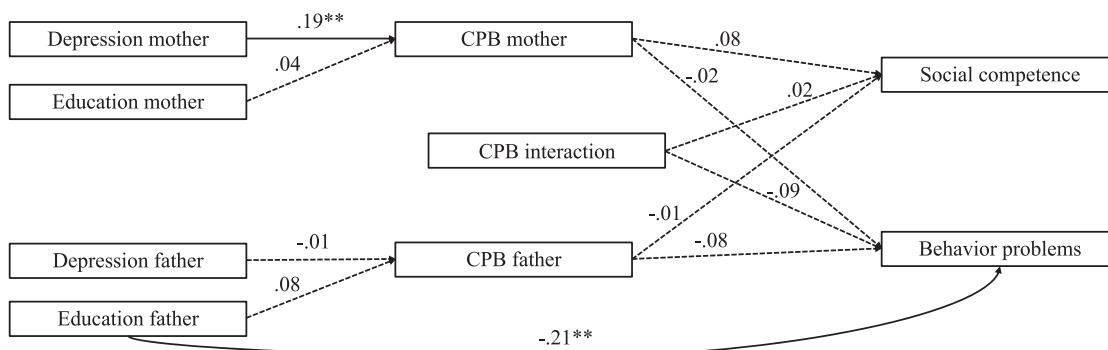
<sup>a</sup> 0 = boy, 1 = girl.

<sup>†</sup>  $p < 0.10$ .

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .



**Fig. 1.** Path model including determinants of CPB and predicting children’s social competence and behavior problems at 12 mo. For clearer depiction, only significant paths between determinants and social competence and behavior problems are presented. Similarly, control variables are not depicted, but they are included in the presentation of results. CPB interaction = statistical interaction between fathers’ and mothers’ CPB.

but in the unexpected direction: mothers with higher depressive symptoms engaged in more CPB. Contrary to our hypothesis, we found no evidence of main or interaction effects between mothers’ and fathers’ CPB and infants’ social competence and behavior problems.

4.1. Mothers’ and fathers’ use of CPB

Our results show that mothers and fathers from diverse low-income U.S. families engaged in CPB at levels comparable to those of Dutch middle-class families of infants (Majdandžić et al., 2016). This is preliminary evidence that CPB, a type of play, might be a universal dimension of parenting observed across ethnic and diverse families. However, future studies should test this with different samples. Our finding that mothers and fathers did not differ in their levels of CPB is consistent with past research on CPB conducted with similar age groups of middle-class White parents (Majdandžić et al., 2016; Möller et al., 2015) but does not support activation relationship theory (Paquette et al., 2020) which says that fathers engage in more behaviors of a challenging nature with their child than mothers. Our findings suggest that during infancy, mothers and fathers are equally likely to encourage their infants to go out of their comfort zone. As children get older, fathers might engage in more physical play than mothers. However, the direction of the association is unclear, and it is possible that older children initiate CPB rather than parents. Whether fathers engage in more CPB than mothers as children get older is an empirical question

that needs to be investigated with low-income ethnically diverse populations.

4.2. Determinants of CPB

Contrary to our hypothesis and to past research on the relations between education and other positive parenting behaviors, parental education was not associated with low-income parents’ CPB (Cabrera et al., 2011). One possible explanation is that the type of CPB that some of the participating parents engaged in were behaviors that encouraged infants to walk or stand up, and thus come naturally to parents and other adults when engaging with infants, irrespective of their level of education. When there are no toys around, some parents may feel that there is not much else to do with infants other than to walk or help them mobilize. In the context of no-toy play, physical play may also come more naturally to parents than other types of play, even for parents with lower levels of education (Cabrera et al., 2011). It is thus possible that CPB is fun and enjoyable play that does not depend on parents’ levels of education. Anyone can engage in this fun play.

Contrary to our hypothesis, only maternal depressive symptoms were associated with CPB, but in the unexpected direction: mothers with higher depressive symptoms showed more CPB. It is possible that some depressed mothers may not be responsive to their infant’s cues, and engage in CPB even if the child is not interested. It is also possible that infants of depressed mothers might try harder to elicit engagement and encouragement from their

mothers, who might appear withdrawn and not engaged (Lyons-Ruth et al., 2013). To test these hypotheses, future research should consider the role of child affect, or examine CPB from a 'serve and return' framework of interaction, by examining which behavior of the infant may prompt the parent to engage in CPB. Compared with mothers, fathers' depressive symptoms were not significantly related to their engagement in CPB. Other studies examining physical play with Latino families corroborate this finding (Cabrera et al., 2011). Perhaps depressive symptoms manifest themselves differently in mothers and fathers. Given that none of the covariates examined in this study were significant for fathers, questions remain about the sources of variability in fathers' CPB.

#### 4.3. Mothers' and fathers' CPB as predictors of infants' social competence

Contrary to our expectations, we did not find support for our hypotheses of a main effect of fathers' and mothers' CPB or a moderation effect between parents' CPB and children's social competence and behavior problems. This finding suggests that having one or two parents engage in high levels of CPB was not important for increasing social competence and lowering levels of behavior problems in infants at the end of the first year. Studies that have examined moderation effects between parents find that these effects tend to be domain-specific (e.g., parental stimulation, empathetic understanding), parent-specific (e.g., mother or father only), and developmental-period specific (e.g., preschool period) (Bradley et al., 2011; Cabrera et al., 2020; Crosnoe et al., 2010; Martin et al., 2010; Miller et al., 2014). Our findings add to this literature by showing that CPB may not be an important predictor of children's social development during infancy, even though it is related to reduced social anxiety later in childhood (see Lazarus et al., 2016; Majdandžić et al., 2018b). The absence of significant associations can also be because of the young age of the children (that said, one study on infants 10–15 months found a significant association of fathers' self-rated CPB with parent-rated infant fearful temperament; Möller et al., 2015) or because CPB does not predict broader aspects of social and emotional development, but only anxiety. CPB may be more domain specific. Future studies should examine whether CPB is more specifically related to older children's anxiety among low-income families. It is also possible that CPB interacts with other parenting dimensions to predict children's social development (see Ispa et al., 2013). Although this question was beyond the bounds of this study, future research should examine this possibility.

Overall, our findings that CPB is related to mothers' but not fathers' depression suggest that within-group differences for mothers and fathers may be different and may reflect distinct mechanisms or processes for mothers and fathers. These findings are similar to those of (Volling, McElwain, Notaro, & Herrera, 2002) with physical play; they found that fathers' physical play was significantly and positively associated with infants' positive affect whereas mothers' physical play was associated with both infant positive and negative affect. The authors hypothesized that during physical play, fathers might be better at eliciting positive affect from their children than mothers. In our study, although we found no differences at the mean level across parents, there may be within-group differences in processes. Our correlational analyses and path model findings that reveal associations for mothers but not fathers support this conclusion, and offer some support for activation relationship theory.

#### 4.4. Limitations

The current study presents some limitations. First, CPB was measured only in one 5-minute context. Although 5-minute

recorded observations of parent-child interactions are typical in this type of research (e.g., Brown et al., 2010), it is a short period of time during which to observe behaviors. Future studies should include longer tasks, more tasks, or base observations on daily samples of parent-child behaviors. Second, we were not able to assess whether CPB is stable across time or if it varied by developmental period. Past research established stability of observed and self-rated CPB from early infancy to toddlerhood in White middle-class mothers and fathers (Majdandžić et al., 2016). We need more longitudinal studies that can track parent-child behaviors over a longer period of time in diverse families. Third, families were part of an intervention study to improve positive parenting behaviors. Our model accounted for the intervention when predicting social adaptation, but it remains possible that the intervention had some influence on the 12-month data.

## 5. Conclusions

This study provides important information on the use of CPB and its influence on children's social development in a sample of low-income, first-time mothers, fathers, and their infants. Overall, we offer preliminary evidence that CPB, a type of encouraging play, is observed among ethnically and socioeconomically diverse families, suggesting that it might be a universal behavior across families of different ethnicity and social classes. However, the lack of significant association with infant behavior suggests that the function of CPB might not be universal, but rather culture-specific. These findings emphasize the importance of conducting normative developmental research with diverse, non-White samples to provide a better understanding of how ethnically and economically diverse fathers and mothers influence their children's social development. Including mothers and fathers to examine both main and interaction effects can be used to design interventions that are more targeted to the needs of families. Although the mothers and fathers in our sample did engage in CPB, this was not related to infants' social development as it has been found in other wealthier samples (e.g., Lazarus et al., 2016; Majdandžić et al., 2018b). Nonetheless, our results indicate that low-income diverse families engage in CPB, and at similar rates as White middle-class families. This shows that these low-income diverse families engage in parenting behaviors that are fun and stimulating, just as other families do. Whether these types of behaviors are enough to explain social adjustment is unclear at this point. We need more longitudinal studies on the normative development of children growing up in low-income and diverse families to provide a more concrete answer.

## Credit Author Statement

Audrey-Ann Deneault: Conceptualization, Coding, Formal analysis, Writing; Natasha Cabrera: Funding acquisition, Project administration, Conceptualization, Writing; Rachel Ghosh: Coding, Writing; Ann-Sophie Tölle: Coding; Jenny Seethaler: Coding; Mirjana Majdandžić: Conceptualization, Methodology, Writing; Stephanie M. Reich: Funding acquisition, Project administration, Writing.

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