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## Parenting and children's representations of family predict disruptive and callous-unemotional behaviors

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### Abstract

Data from a large prospective longitudinal study ( $n = 1,239$ ) was used to investigate the association between observed sensitive parenting in early childhood and children's representations of family relationships as measured by the Family Drawing Paradigm (FDP) in first grade as well as the extent to which these representations partially mediate the influences of early caregiving experiences on later conduct problems and callous-unemotional behaviors. A structural equation modeling approach revealed that less sensitive parenting at 24, 36, and 58 months predicts higher levels of conduct problems (CP) and callous-unemotional (CU) behaviors in first grade controlling for earlier measures of CP and CU behaviors. Results also indicated that greater dysfunctional family representations, as assessed with the FDP, are significantly associated with higher CU behaviors in the first grade, but not CP. Finally, a test of the indirect pathway suggests that children's dysfunctional family representations may, in part, account for the association between sensitive parenting and CU behaviors.

### Keywords

Parenting; Internal Working Models; Conduct Problems; Callous-unemotional Behaviors; Children's Family Drawings

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The development of the person is a dynamic process whereby cognitive and behavioral structures and functions grow from the collaborative interplay between the developing child and their caregiving experiences (Cairns & Magnusson, 1996; Cox & Paley, 1997; Gottlieb & Halpern, 2002). Ideally, throughout development parents create sensitive and supportive caregiving environments that meet the emotional needs of their children. These ongoing interactions are translated into internalized representations of these relationships (Bretherton & Mulholland, 2008), which likely affect children's developing sense of self and guide children in seeking and interpreting future experiences and relationships (Fury, Carlson, & Sroufe, 1997; Fraley, 2002; Sroufe, Egeland, Carlson, & Collins, 2005). It has been suggested that when these internal representations involve fears and uncertainty within the caregiving relationship or a sense of isolation and insensitivity, the child may be at risk for later maladaptation and psychopathology (Carlson, 1998; Lyons-Ruth, 1996), including conduct problems (CP) (Fearon, Bakermans-Kranenburg, van Ijzendoorn, Lapsley, &

Roisman, 2010; van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999) and callous-unemotional (CU) behaviors (Bohlin, Eninger, Brocki, & Thorell, 2012; Pasalich, Dadds, Hawes, & Brennan, 2012). The current study examines the associations between early parenting behaviors, internalized representations of family functioning, and the emergence of CP and CU behaviors in middle childhood.

Whereas CP are characterized by aggressive, deceitful, norm-violating, and sometimes violent behaviors (Lorber, 2004), CU behaviors describe non-normative emotional, affective, and cognitive deficits such as a lack of guilt, empathy, and fear and often characterize children who also demonstrate an over-focus on reward and insensitivity to punishment (Blair, Peschardt, Budhani, Mitchell, & Pine, 2006; Frick & White, 2008; Kotler & McMahon, 2005). Several longitudinal studies suggest that CU behaviors may be best characterized as a distinct construct given that they can occur in the absence of CP (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011; Frick et al., 2003; Rowe et al., 2010; Viding & McCrory, 2012; Willoughby, Waschbusch, Moore, & Propper, 2011; Willoughby, Mills-Koonce, Gottfredson, & Wagner, 2014) and may be informed by differing etiological processes (Frick, Ray, Thornton, & Kahn, 2014).

Although there is both considerable interest in better understanding the etiology of CP and CU behaviors early in life and a growing recognition of the association between sensitive caregiving and later CP and CU behaviors (e.g., Waller et al., 2014), limited research has examined possible mechanisms through which early caregiving experiences influence later CP and CU outcomes. As such, the first goal of the current study was to examine the associations between caregiver sensitivity and later CP and CU behaviors. The second goal was to examine associations between caregiver sensitivity and children's internal representations family dysfunction using the Family Drawing Paradigm (Fury et al., 1997). The third goal was to examine the extent to which children's internal representations partially mediate the hypothesized links between caregiver sensitivity and later CP and CU behaviors. To address these goals we used observational assessments of caregiver sensitivity, assessments of children's internalized representations of family dysfunction based on coding children's family drawings, and report of CP and CU behaviors in first grade.

## Caregiver Sensitivity, Conduct Problems, and Callous-Unemotional Behaviors

Few prospective studies have examined the developmental origins of CP and CU behaviors, but research has demonstrated distinct autonomic (Willoughby et al., 2011), hypothalamic-pituitary-adrenal axis (Loney, Butler, Lima, Counts, & Eckel, 2006; Mills-Koonce et al., 2014), and neurological (Marsh et al., 2008) functioning among young children high on CP and CU behaviors. Taken together with literature suggesting that CU behaviors are moderately heritable (Viding, Blair, Moffitt, Plomin, 2005), these findings suggest that the etiologies of CP and CU behaviors are, at least partially, biologically based. However, recent studies also provide evidence for associations between early caregiving and the development and maintenance of CP and CU behaviors (see Waller, Gardner, & Hyde, 2013 for review; see also Bohlin et al., 2012; Fearon et al., 2010; Pasalich et al., 2012; Vando et al., 2008;

van Ijzendoorn et al., 1999), suggesting that a portion of these etiological pathways also include experiential processes.

With respect to parenting behaviors, longitudinal research suggests that early caregiving likely exerts enduring influence on children's behavioral problems (Haltigan, Roisman, & Fraley, 2013) and externalizing psychopathology more broadly (Lorber & Egeland, 2009). Both negative and positive aspects of caregiving are associated with antisocial behaviors (Dodge & Pettit, 2003) and, more specifically, CP and CU behaviors (c.f., Waller et al., 2013). Links between sensitive caregiving and CP and CU behaviors, in particular, are supported by research that shows that emotional and affective characteristics of children (e.g., prosociality, empathy, guilt) that are negatively associated with CU behaviors develop early in life (Kochanska, Gross, Lin, & Nichols, 2002; Knafo, Zahn-Waxler, Van Hulle, Robinson & Rhee, 2008) and are heavily influenced by early sensitive caregiving (e.g., Kochanska, 1997; Kiang, Moreno, & Robinson, 2004; Kochanska, Forman, Aksan, & Dunbar, 2005). For example, maternal warmth and sensitivity have been linked to empathic responding (Kiang et al., 2004), guilt (Kochanska et al., 2005) and the development of prosocial behaviors (Newton, Laible, Carlo, Steele, & McGinley, 2014). Findings that low levels of positive parent-child relationship quality and parental warmth are cross-sectionally and longitudinally associated with higher levels of CP and CU behaviors (e.g., Frick et al., 2003; Kimonis et al., 2013; Waller et al., 2014) are not surprising given the role of sensitive parenting in the development of both basic and complex emotions and, more generally, the development of conscience (Kochanska, 1997; Swain, Lorberbaum, Kose, & Strathearn, 2007).

A growing body of literature demonstrates associations between sensitive caregiving and CP and CU behaviors. Parental warmth has been found to be negatively correlated with CP and CU behaviors for boys (Pasalich, Dadds, Hawes, & Brennan, 2011) and was related to a slight reduction in CU behaviors in girls (Barker et al., 2011). Pardini and colleagues (2007) found that child-reported parental warmth and involvement predicted decreases in both antisocial and CU behaviors over time (Pardini, Lochman, & Powell, 2007). In a mixed-sex community cohort (n=1,008), Hawes and colleagues (2011) found that warm and sensitive parenting predicted decreases in CU behaviors one year later in both boys and girls. Additionally, Kroneman and colleagues (2011) found that low levels of parental sensitivity were associated with high levels of CP and CU behaviors (Kroneman, Hipwell, Loeber, Koot, & Pardini, 2011) and a recent paper by Waller and colleagues (2014) demonstrated that CU behaviors in toddlerhood were predicted by observed measures of parental warmth controlling for earlier measures of CU behaviors (Waller et al., 2014). Taken together, extant findings suggest that parental sensitivity and warmth may be particularly important for the development of CP and CU behaviors, as well as the emotional and affective correlates of CP and CU behaviors.

### **Internalization of Early Caregiving Experiences**

Bowlby's (1982) attachment theory posits that a child's mental health is closely tied to early relationships with caregivers from which the child, successfully or unsuccessfully, derives emotional and physical support (Bretherton & Munholland, 2008). The extent to which these

relationships influence development across the preschool and middle childhood period may depend on the translation of patterns of interactions and experiences into the child's mental representations of relationships, or internal working models. It is suggested that mental representations of the self and others are particularly important because they serve as a guide for interpersonal behavior, communication, and future relationship formation. The formation of well-functioning, revisable, and secure representations of family and caregiving experiences arise from a history of interactions with sensitive and responsive attachment figures who build security and trust by providing support, protection and emotional availability. Insensitive and unavailable parenting (Cox, Owen, Henderson, & Margand, 1992; Madigan et al., 2006) may convey rejection, fear, and uncertainty resulting in the development of dysfunctional internal working models of the relationships within the family (Bretherton & Munholland, 2008; Fraley, 2002). In this case, children's internalizations may reflect isolation and detachment or hostility and frustration between the child and family which has implications for future relationships and the development of maladaptive socioemotional behaviors over time (Hoeve et al, 2012; Fearon et al., 2010; Vando, Rhule-Louie, McMahon, & Spieker, 2008). Indeed, the quality of early parent-child relationships has been linked to both positive—such as empathy and prosocial behaviors (Panfile & Laible, 2012), as well as negative—such as externalizing (e.g., Fearon, Bakermans-Kranenburg, van Ijzendoorn, Lapsley, & Roisman, 2010; Warren, Emde, & Sroufe, 2000) outcomes.

A large number of studies show that security of attachment, derived from nonrepresentational measures where child behavior is observed, is predicted by variation in maternal sensitivity, with higher sensitivity predicting a greater likelihood of security (see De Wolff & van Ijzendoorn, 1997 for review). These findings are consistent with the idea that the child's mental representations are based on early caregiving experiences and may constitute a bridge between early experience and the development of self and expectations that influence future behavior (Thompson, 2006). From this perspective it is believed that sensitive caregiving plays both a role in the early socialization of children (Laible & Thompson, 2007) and the development of healthy internal representations of family experiences (Bowlby, 1982; Bretherton & Munholland, 2008), both of which are likely to enhance positive child outcomes (Kochanska, Aksan, Knaack, & Rhines, 2004) and buffer against maladaptive trajectories of antisocial behaviors (Kochanska, Barry, Steltem, & O'Bleness, 2009).

Such a theoretical model of how early experiences are internalized and carried forward in children is evidenced in both developmental and clinical research. Research with school-age children has shown that parental warmth is associated with children's representations that contain prosocial themes such as empathy, affection and affiliation whereas insensitive parenting techniques are associated with aggressive or conflictual representations (Laible, Carlo, Torquati, & Onatia, 2004). Sturge-Apple and colleagues reported that children's representations partially mediated the association between experiencing early familial conflict and later emotional difficulties and behavioral compliance problems (c.f. Davies and Cummings, 1998; Sturge-Apple et al., 2008). Specific to sensitive caregiving, Kochanska and colleagues (2013) found that warm and sensitive parenting protects against externalizing behaviors in the presence of CU qualities suggesting that the early mother-child relationship

may be particularly important for understanding the etiology of this behavioral phenotype. However, the linkages between early caregiving experience, internalized representation of relational functioning, and CP and CU behaviors have not been fully investigated.

## Representational Measures of Family Functioning

Children may internalize family dysfunction as feelings of fear and isolation, hostility between family members, ambiguous roles and boundaries within the family and a lack of cohesion within the family unit. Interactions with caregivers contribute to such internalizations, which in turn function as cognitive filters that influence the way children view themselves and their families (Bretherton & Munholland, 2008) and, importantly, this process has implications for behavioral development (Bowlby, 1988). Researchers have demonstrated that variability in these qualities can be observed in children's family drawings wherein the embellishment, detail, vibrancy, creativity, size, and positions of people and objects can reflect children's internalizations of early caregiving experiences (Burkitt, Barrett, & Davis, 2003). The Family Drawing Paradigm (FDP) is a standardized assessment that was designed to capture the variability in children's family drawings. Fury, Carlson, and Sroufe (1997) have shown that children's drawings offer a robust look into children's representational models of early experience and that the FDP, in particular, may be effective in assessing subjective, personal, and subconscious aspects of representational models of the self and relationships. Preliminary work by Kaplan and Main (1986) identified a theoretically-based scoring system for the FDP that includes the current rating scales, and Madigan and colleagues (2003) have demonstrated that links between early experiences and later representations of family functioning are most evident when these global rating scales are used to assess children's representations (as opposed to identifying distinct attachment classifications; see also Rutter, Kreppner, & Sonuga-Barke, 2009; Zeanah, Berlin, & Boris, 2011).

Although considerable research demonstrates links between sensitive caregiving experiences and children's representations of family relationships at early ages (Bailey, Moran, Pederson, & Bento, 2007; De Wolff & Van IJzendoorn, 1997; NICHD Early Child Care Network, 1997, 2006; Pederson & Moran, 1996; van IJzendoorn et al., 1999), the link between sensitive caregiving behaviors and representations in middle childhood is more tenuous, perhaps due to an absence of a dominant paradigm for assessing representational measures of family relationships at this age. In infancy, internal representations are reflected in the observed behavior of the child during paradigms such as the Strange Situation Paradigm (Ainsworth, Blehar, Waters, & Wall, 1978) where the child undergoes separations and reunions with the attachment figure. With cognitive advances that occur in the transition to the symbolic representational capacities of early childhood, new representational methods are necessary to assess internal representations of early family experience. Although doll-play (Solomon & George, 1999 for review) and story stems tasks (Bretherton et al., 1990; Green, Stanley, Smith, & Goldwyn, 2000; Robinson, Mantz-Simmons, Macfie, & the MacArthur Narrative Working Group, 1992) have made significant methodological contributions, these approaches rely on children's use of verbal narratives (which can be limited by cognitive and language abilities at early ages) to share experiences and aspects of their inner worlds (Stern, 1985; Thompson, 1994; Wolf, 2003).

In contrast, children can express both conscious and unconscious thoughts, wishes and concerns about the self and family functioning through their drawings of their family (Fury et al., 1997; Koppitz, 1968). These aspects of children's drawings have been shown to be associated with internalizing symptoms (Goldner & Schraf, 2012), sociability (Pianta, Longmaid, & Ferguson, 1999), early caregiving, and other family and contextual experiences (Zvara et al., 2014). The Family Drawing Paradigm has been validated within diverse racial ethnic and international samples (Goldner & Scharf, 2012; Pianta, Longmaid, & Ferguson, 1999; Shiakou, 2012), with victims of abuse (Piperno, Di Biasi, & Levi, 2007) and with sample at high socio-demographic risk (Madigan, Moran, & Pederson, 2006) and low-to-moderate socio-demographic risk (Fury et al., 1997). However, to date there is no work (of which we are aware) that has investigated the extent to which assessments of child representations of family functioning from family drawings serve as a mediator of the effects of early caregiving experiences to later child CP and CU behaviors.

## Current Study

Based on extant literature, it was expected that (1) prospective measures of sensitive parenting behaviors at 24, 36, and 58 months would be negatively correlated with conduct problems and callous-unemotional behaviors at 1<sup>st</sup> grade above and beyond earlier measures of CP and CU behaviors, (2) that sensitive parenting behaviors would predict children's representations of family relationships based on a Family Drawing Paradigm, and that (3) the associations between early sensitive caregiving and later CP and CU behaviors would be partially mediated by children's internal representations. As distinct behavioral and emotional/affective outcomes, children's CP and CU behaviors are examined as separate continuous variables to allow for testing of unique direct and indirect effects of parenting and children's representations of family dysfunction.

## Methods

### Participants

The Family Life Project (FLP) is a large longitudinal study of children and families living in non-urban, lower income communities in the U.S. Families and their newborns that lived in two major geographical areas of high child rural poverty (including three counties in eastern North Carolina and three counties in central Pennsylvania) were recruited using a stratified random sampling procedure yielding a representative sample of 1,292 families recruited over a one-year period at the time mothers gave birth to a child. See Willoughby et al. (2013) for more information on the recruitment of the FLP sample. The current study uses observational parenting data collected during home visits when the target children were 24 months (n=1055), 36 months (n=1055), and 58 months (n=963). Measures of conduct problems (n=1078), callous-unemotional behaviors (n=1080), and representations of family dysfunction (n=954) were collected at the 1<sup>st</sup> grade home visit. Independent sample t-tests were estimated to compare mean differences on demographic measures between 114 individuals who were missing data on variables collected at the 1<sup>st</sup> grade home visit and a random subsample of individuals who were not missing data. There is no evidence that missing vs. non-missing groups varied as a function of income, state, gender, or race. The

final sample used in the current study consisted of 1,239 families that had at least partial data at one of the assessment points.

## Procedures

Data were collected during home visits completed when the child was approximately 24, 36, 48, and 58 months old, and then during the 1<sup>st</sup> grade. Visits consisted of interviews, questionnaires, child assessments, and observations of mother-child interactions. All interviews and questionnaires were computerized. At the 24 and 36 month visit, mothers and children were videotaped while engaging in a 10 minute task, which consisted of 3 puzzles of increasing difficulty. Mothers were instructed that the task was for the child to complete, but she could help as needed. At the 58 month visit, mother-child interaction involved a tower building task in which the dyad was instructed to replicate a tower that the RA built using blocks of different sizes and shapes. The mother again was instructed that the task was for the child to complete but that she could assist the child in any way she thought necessary. The second portion of the interaction involved a card game in which the mother and child were competing to collect the most cards in a “slap-jack” game. The two interactions lasted a total of 15 minutes.

At the first grade home visit children were asked to complete a drawing of their family (the Family Drawing Paradigm, or FDP) in an area separate from the child's parents or siblings. An initial warm-up task was used to promote a relaxed atmosphere and to assure the child that the drawing task was not a test of ability. As a warm up, children were asked to draw a “person” using a pencil and a standard 8 × 10 sheet of white paper. Children then were asked to draw a picture of their family on a 12 × 18 sheet of blank white paper using a set of 10 basic color felt-tip markers. No further direction was provided. Upon completion of the drawing, research assistants asked the children to identify all persons included in the drawing and state their relation to the child. Drawings were labeled in pencil by the research assistant. Also at the first grade home visit, mothers completed questionnaires on children's CP and CU behavior. Previous measures of CP and CU behaviors were also collected during a 48 month home visit and used here as covariates to control for the autoregressive effects.

## Measures

**Maternal sensitive parenting**—Mother-child interactions during the recorded tasks at 24, 36, and 58 months were later coded to assess levels of mothers' sensitivity, detachment, and positive regard (Cox, Paley, Burchinal, & Payne, 1999; National Institute of Child Health and Human Development Early Child Care Research Network, 1999). Trained coders assigned a rating on each of the aforementioned constructs using a scale ranging from 1 (*not at all characteristic*) to 7 (*highly characteristic*). Each coding team consisted of four to five coders and included one or two master coders. Each coder was trained to be reliable with the master coder(s). Each coder completed approximately 30% of the assigned video tapes with the master coder(s). Reliability was calculated using the intraclass correlation for the independent ratings made for the overlapping coding assignments. Reliability across subscales and composites was high (intraclass correlations >.80 for all subscales). The specific intraclass correlation for sensitivity, positive regard, and detachment were .89, .86, and .82 at 24 months, .88, .85, and .83 at 36 months, and .87, .88, .82 at 58 months,

respectively. Factor analyses have guided the creation of a sensitive parenting composite for each time point comprised of the mean of sensitivity (level of responsiveness and support offered to the child contingent on the child's needs), positive regard (positive feelings and warmth directed toward the child), and detachment (reversed scored; degree to which the mother is disengaged) (See Cox et al., 1999 and NICHD ECCRN, 1999 for details on this composite). The factor loadings for sensitivity, positive regard, and detachment were .89, .83, and -.88 at 24 months, .82, .78, and -.86 at 36 months, and .93, .88, and -.73 at 58 months, respectively. The validity of these measures is well-established (NICHD ECCRN, 1999). Consistent with work suggesting that warm and sensitive parenting is fairly stable in early childhood (Behrens, Sybil, & Parker, 2012; Rimehaug, Wallander, & Berg-Nielsen, 2011), systematic variability in the rates of change in sensitive parenting was not observed in our sample across these three time points ( $\eta = -0.086, p > 0.05$ ). Also, the three time points were highly correlated and standardized factor loadings of each time point of parenting were comparable. As such, maternal sensitivity composites from 24, 36, and 58 months were used to create a latent maternal sensitivity factor that reflects the type of caregiving the child received during the 3 to 4 years prior to the 1st grade home visit.

**Children's Representations of Family Dysfunction**—The FDP was coded using the global rating scales originally developed by Kaplan and Main (1986) and adapted by Fury and colleagues (1997) to assess children's internal representations of family dysfunction. This measure is currently operationalized as a latent factor of the following six 5-point rating scales. *Family Pride* assesses the child's sense of belonging and the cohesion of the family unit. A drawing that would score low on family pride would demonstrate no characteristics of the figures or context that identifies the figures as being part of a common group. *Vulnerability* reflects the child's sense of fear and uncertainty within the family or with respect to one or multiple family members. Drawings in which the child is positioned far away from other adult members, is disproportionately smaller than other figures, or is not included in the drawing at all would score high on vulnerability. *Emotional Distance* reflects isolation and detachment between the child and family, particularly with the primary caregiver and is measured by assessing the distance between the child and the primary caregiver and the extent to which the facial expressions and body positions of the figures are opened or closed. *Tension* and *Anger* assess the hostility and frustration of the child and is operationalized by assessing the extent to which the child makes false starts, attends to fine detail, and uses the space on the page proportionately. *Role Reversal* reflects the child's perceptions of non-normative roles of adults and children with respect to emotional and instrumental care and support within the family and is assessed by noting the size and position of caregivers in relation to the child and, if applicable, siblings. Lastly, *Global Pathology* reflects the overall degree of negativity, lack of organization, incompleteness and incoherence of the drawing. A drawing that scores high on global pathology may receive high scores on other negative scales but also may contain problematic or concerning elements or themes which often times relate to the emotional or physical safety of the child. Receiving high scores on other negative constructs does not necessitate receiving a high score on *Global Pathology*. Coders were trained to reliability by master coders, all drawings were double coded, and final scores were determined by conferencing. Intraclass correlations (ICCs) between coders for the specific subscales were as follows: .82 for



Family Pride, .89 for Vulnerability, .81 for Emotional Distance, .87 for Tension/Anger, .81 for Role Reversal, and .82 for Global Pathology. The reported ICCs were calculated using the scores assigned prior to conferencing.

**Conduct Problems**—Levels of Conduct Problems were rated by maternal primary caregivers using the Disruptive Behavior Disorder Rating Scale (DBDRS) at 1st Grade. The DBDRS (Barkley, 1997; Pelham, Gnagy, Greenslade, & Milich, 1992) is a DSM-IV guided rating scale that includes subscales for assessing oppositional defiance (ODD), hyperactivity-impulsivity, conduct disorder (CD), and inattention. ODD items assess various qualities including defiance, argumentativeness, and anger. CD items focus on more disruptive behaviors such as aggression towards people and animals, destruction of property, theft, and serious violations of rules. Composite scores representing oppositional defiant disorder and conduct disorder, what we broadly refer to as CP, were calculated ( $\alpha = 0.92$ ). The psychometrics of the DBDRS have been evaluated (see Wright, Waschbusch, & Frankland, 2007) and the validity of the DBDRS has been established (Pelletier, Collett, Gimpel, & Crowley, 2006; Erford, 1997). A continuous measure of conduct problems was used in all analyses.

**Callous-Unemotional Behaviors**—The Inventory of Callous Unemotional (ICU; Frick, 2004) traits was used to assess callous-unemotional behaviors at first grade. The ICU was completed by maternal primary caregivers who responded to 24 items on a 4-point likert scale ranging from 0 (not at all true) to 3 (definitely true). The items that comprise the ICU were developed from other highly established clinical assessments (e.g. APSD, PCL-YV) and include questions about the extent to which the child uses emotions, expresses feelings, cares about getting in trouble, seems cold and uncaring, and hurts others' feelings. The factor structure and predictive utility of the ICU has been confirmed with samples ranging in age from 13 to 20 years of age (see Essau, Sasagawa, & Frick, 2006; Fanti, Frick, & Georgiou, 2009; Kimonis et al., 2008; Roose, Bijttebier, Decoene, Claes, & Frick, 2011) and with samples as young as age 3 (see Ezpeleta, Osa, Granero, Penelo, & Domènech, 2013). A continuous measure of callous-unemotional behaviors was used in all presented analyses ( $\alpha = 0.71$ ).

**Additional covariates**—A number of additional covariates were included to avoid confounding child and parenting effects on later CP and CU behaviors. These include *child's sex* which was collected at the time of recruitment and *child's age* in months which was based on age at the first grade visit (mean = 86.74 months). *Child IQ* was assessed by the Vocabulary and Block Design subscales of the Wechsler Preschool and Primary Scales of Intelligence (WPPSI - III; Wechsler, 2002); these scores were combined to form an estimate of intellectual functioning at age 3 following Sattler's method (Sattler, 2001). Although earlier measures of CP and CU behaviors were not collected contemporaneously with the other exogenous predictors in the model, they were collected when children were 48 months of age. *Earlier CP* was derived from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) and *earlier CU behaviors* were derived from Antisocial Process Screening Device items which were placed in the SDQ. This approach for collecting information about early CP and CU has been validated in the literature (see Dadds, Fraser, Frost, & Hawes,

2005). Other demographic factors were accounted for by the use of individual probability weights (described below).

### Analytic Strategy

The proposed hypotheses were addressed using structural equation modeling (SEM) methods. SEM models were fit using Mplus 5.2 (Muthén & Muthén, 2007). Given the complex sampling design of the Family Life Project, analyses utilized individual probability weights associated with oversampling of low-income and African American Families and stratification on income, state, and race. Additional model covariates included 48 month measures of CP and CU behaviors, child's IQ, child's gender, and the child's age in months at the first grade visit. Because individual probability weights and stratification were implemented in the current analyses, SEM models were estimated using a robust maximum likelihood estimator (MLR). Missing data were handled using the full information maximum likelihood methods (Enders & Bandalos, 2001). The Satorra-Bentler scaled (mean-adjusted) chi-square difference test was used to compare nested models (Satorra & Bentler, 2001). Overall model fit was determined using root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and comparative fit index (CFI). Good fit was defined as CFI values  $\geq 0.95$ , RMSEA values  $\leq 0.06$ , and SRMR values  $\leq 0.08$  (Hu & Bentler, 1999). The standard errors of specific indirect effects were estimated using the delta method in Mplus 5.2 (Muthén & Muthén, 2007).

## Results

### Descriptive Statistics

Table 1 presents the bivariate correlations, means, and standard deviations for the model covariates and variables of interest. Each of the family drawing scales, which were measured in first grade, was significantly correlated with each time point of sensitive parenting (24, 36, and 58 months). Exceptions include the correlation between emotional distance with parenting at 24 months and tension/anger with parenting at 24 months and 58 months. Conduct problems at first grade were correlated with every family drawing scale and first grade CU behaviors were significantly correlated with every family drawing scale except for tension/anger. The negative correlation between first grade CU behaviors and sensitive parenting was stronger than the correlation between first grade CP and parenting.

### Measurement Models

Log transformations of the family drawing items were used to address skewness. A confirmatory measurement model for the family drawing was tested prior to examining the bivariate associations between latent factors and fitting the full structural model. Modification indices in the family drawing measurement model suggested that emotional distance should be allowed to covary with vulnerability and role reversal. The revised measurement model for representations of family dysfunction demonstrated adequate fit ( $\chi^2(7) = 63.41, p = 0.001$ ; CFI = 0.97; RMSEA = 0.09; SRMR = 0.03) and significant latent variance ( $p < 0.001$ ). Although RMSEA did not reach the 0.06 threshold outlined above, the fit of this model was deemed adequate given that it was one part of larger subsequent structural models. Additionally, researchers have suggested that an RMSEA of less than 0.1

indicates reasonable error of approximation (Browne & Cudeck, 1993), which may be particularly true for simple measurement models given that RMSEA represents misspecification per degree of freedom (Rigdon, 1996). Standardized factor loadings ranged from 0.40 to 0.95. Consistent with its being reversed scored, the loading for family pride was -0.72. Although qualitatively distinct, the *Global Pathology* construct captures the overall degree of negativity and pathology in the family drawings and, therefore, overlaps slightly with some of the other constructs. As such, the *Global Pathology* latent indicator is larger than the other indicators. However, each indicator contributed significantly to the latent factor of dysfunctional family representations and was retained.

Concurrent measurement models and bivariate latent correlations were tested for sensitive parenting and the family drawing prior to fitting the full structural model. The bivariate latent measurement model demonstrated good fit:  $X^2(24) = 92.75, p = 0.00$ ; CFI = 0.97; RMSEA = 0.05; SRMR = 0.03. The standardized factor loadings for 24 month, 36 month, and 58 month sensitive parenting were 0.74, 0.75, and 0.76, respectively. The latent factors for parenting and the family drawing demonstrated significant variance,  $p < 0.001$ . The latent correlation between representations of family dysfunction and sensitive parenting was significant ( $\phi = -0.23; p < 0.001$ ).

### Structural Equation Model

The final model provided good fit to the data:  $X^2(77) = 228.18, p = 0.00$ ; CFI = 0.96; RMSEA = 0.04; SRMR = 0.03. Significant standardized path coefficients indicate that less sensitive parenting in early childhood predicts higher levels of dysfunctional family representation ( $\beta = -0.18; p < 0.001$ ). Further, less sensitive parenting in early childhood predicts higher levels of conduct problems ( $\beta = -0.17; p < 0.001$ ), and higher levels of callous-unemotional behaviors ( $\beta = -0.23; p < 0.001$ ) in first grade. Standardized path coefficients also indicate that greater dysfunctional family representations are significantly associated with greater CU behaviors ( $\beta = 0.08; p < 0.05$ ) in first grade, but not CP. Indirect effects suggest that the relationship between sensitive parenting and CU behaviors is partially mediated by a dysfunctional family representation of the family ( $\beta = -0.02; p = 0.037$ ).

Figure 1 presents the standardized path coefficients for the associations between sensitive parenting, representations of the family, CP and CU behaviors. All standardized parameter estimates including parameter estimates between the model covariates and variables of interest are shown in Table 2. The full SEM allowed all exogenous variables to covary and model covariates (child's sex, IQ, age in months at the first grade visit, and earlier measures of CP and CU behaviors) were included in the final structural model. Control variables are not shown in Figure 1 for ease of reading but are included in Table 2. The autoregressive effects of earlier CP and CU behaviors were controlled for by regressing the 1<sup>st</sup> grade CP and CU trait outcomes on CP and CU behaviors measured at 48 months, respectively. Preceding stages of model building also regressed first grade representations of family functioning on earlier measures of CP and CU behaviors. Earlier CP ( $\beta = 0.060; p = 0.14$ ) and CU behaviors ( $\beta = 0.045; p = 0.31$ ) did not significantly predict first grade representations of family functioning. It is noteworthy that the significance of all observed

relationships remained unchanged with the inclusion of these parameters. However, a Satorra-Bentler scaled (mean-adjusted) chi-square difference test did not support the inclusion of the two extra parameters ( $X^2(2) = 3.97, p = 0.14$ ) and they were not included in the final SEM model for the sake of parsimony but the autoregressive effects of earlier CP and CU behaviors on the outcomes of interest were retained. The conditional residuals of first grade CP and CU behaviors were also allowed to covary ( $cov(\zeta_{cu}\zeta_{cp}) = 0.05, p < 0.001$ ). It is important to note that, given the lack of temporal precedence between the first grade outcomes, it is plausible that the direction of effects between CP and CU behaviors and representations of family functioning could be reversed. Although unable to formally distinguish between competing models, our confidence in the direction of effects as hypothesized is strengthened by extant research (c.f. Davies and Cummings, 1998; Sturge-Apple et al., 2008) and by the non-significant relationship between earlier CP and CU behaviors and representations of family functioning in first grade.

## Discussion

The current investigation provides additional support for the link between sensitive caregiving on the development of CP and CU behaviors and makes unique contributions to our understanding of how early caregiving experience and children's representations of family dysfunction contribute to emerging CU behaviors. This is one of the first studies to directly examine this potential developmental pathway and benefits from the use of longitudinal data, novel measurement approaches, and sophisticated modeling strategies. Although there is a rather large research literature examining associations between familial experiences and the development and persistence of conduct problems (Deater-Deckard & Dodge, 1997; Loeber & Hay, 1997; Shaffer, Lindhiem, Kolko, & Trentacosta, 2013), and a growing literature on sensitive caregiving experiences and the development of CU behaviors (see Waller et al., 2013 for review), there remains a paucity of research examining the representational mechanisms through which early experiences are carried forward to influence these outcomes. The significant negative pathway between sensitive parenting and CP and CU behaviors is consistent with a growing literature suggesting that a lack of warm and sensitive parenting early in life is relevant for the development of these behavioral phenotypes (Hawes & Dadds, 2005; Pasalich et al., 2011). The current study indicates that early parenting significantly predicts children's later CP and CU behaviors controlling for earlier measures of CP and CU behaviors, and that representations of family relationships accounts for part of the association between early caregiving and later CU behaviors, but not the association between early caregiving and later CP.

Attachment theory provides a model for how early experiences are incorporated into cognitive representations (see Green and Goldwyn, 2002; Roe et al, 2006). Such internal working models control access to attachment-related experiences, emotions, and feelings that, when distorted by insensitive or unresponsive experiences with caregivers may result in maladaptive representations of the self and others, compromised development of complex emotions such as empathy and guilt, and pathological behavioral and affective functioning (Bowlby, 1982). Our findings suggest that these processes may be relevant to the development of CU behaviors given associations between CU behaviors and measures of individual relational dysfunction and reduced feelings of empathy and guilt. Similarities can

be drawn between our findings and literature that has linked CU behaviors with insecure attachments using representational measurement techniques (Bohlin et al., 2012; Pasalich et al., 2012), but extends those findings by examining observed parenting and representations of family functioning simultaneously in the prediction of CU behaviors. Although the point estimates for the associations between children's representations of family functioning and the two outcomes were comparable, the association for CP did not reach significance. It is possible that dimensions of relational functioning, as measured by the FDP, may be less related to the overt behaviors that characterize CP than to the emotional/affective processes that are associated with CU behaviors at this age. It should also be noted that only a portion of the variance in CU behaviors in first grade was accounted for by sensitive caregiving and children's representations of family relationships, suggesting alternative pathways to elevated CU behaviors in the presence of early insensitive caregiving.

The current study contributes to the literature by examining the direct effects of observed early caregiver sensitivity on later CP and CU behaviors above and beyond earlier CP and CU behaviors as well as the extent to which children's representations of caregiving experiences contribute to the understanding of these relationships. Earlier studies that have relied on self-report measures of parenting collected during middle childhood and adolescence have reported mixed findings regarding the associations between parenting and later CP and CU behaviors. For example, ineffective parenting (Wootton and colleagues, 1997), negative parental discipline (Viding, Fontaine, Oliver, & Plomin, 2009), and environmental adversity (Edens et al., 2008; Oxford et al., 2003) have been associated with conduct problems, but only for children not demonstrating CU behaviors. Given the threats to validity associated with self-report methods of assessing parenting (Morsbach & Prinz, 2006), observational techniques strengthen conclusions that can be drawn about the associations between parenting and CU behaviors. The current study joins a growing body of research that demonstrates associations between observational measures of parenting behavior and later CP and CU behaviors (Dadds et al., 2011; Waller et al., 2012; Waller et al., 2013 for review), even after controlling for earlier behaviors (e.g., Waller et al., 2014). The current study is further strengthened by the longitudinal prospective design of the Family Life Project and the population-based random stratified sample that reduces the threat of selection effects and allows for greater generalizability than is possible with community or clinic-based samples.

### Limitations and Future Directions

There are a number of limitations to the current study that are important to note. First, given the correlational nature of this study, we cannot unambiguously establish directionality of the relationship between the children's internalizations of early caregiving experiences and CU behaviors at first grade. Although we found no evidence that earlier CP and CU behaviors predict children's internalizations and the autoregressive effects of CP and CU behaviors were accounted for in the final model, the fact remains that the cross-sectional nature of the outcomes does not allow for strong inferences about the direction of the relationship between internal representations of family dysfunction CP and CU behaviors. We were also unable to use the same measures of CP and CU behaviors at each time point given the limitations of the data.

Second, the reported findings should be interpreted with the understanding that all of the reported effects are of small magnitude. The relationship between early sensitive parenting experiences and child adjustment is complex and it is undoubtedly the case that children's internalizations of caregiving is only one of many developmental mechanisms that contribute to the associations between parenting and later CU behaviors. Additionally, although the representativeness of the current sample may aid in generalizability of the findings, it may lack the level of behavioral severity that would be observed in clinical samples thus contributing to the small effects presented in Tables 1 and 2.

Third, it is also important to note that coercive processes characterized by the bidirectional interaction between children's and parents' behavior have been well documented (e.g., Patterson, 2002). Hawes and colleagues (2011) found that CU behaviors predicted changes in parenting just as parenting predicted changes in CU behaviors (Hawes et al., 2011). Further, Waller and colleagues (2014) provide initial evidence that the affective deficits associated with CU behaviors, rather than behavior problems in general, may reduce the quality of positive and warm interactions between mothers and their children. Their work suggests that qualities of CU behaviors may contribute to a lack of reciprocity between the mother and child which could result in a decrease in sensitive parenting practices over time (Waller et al., 2014). Although the current study allowed earlier measures of CP and CU behaviors to covary with sensitive caregiving, the correlational nature of the design and times at which data were collected do not allow for a thorough investigation of possible bidirectional processes.

Fourth, the current study included well-designed and validated measures of parenting behaviors and representational functioning. However, future studies should integrate potential child-level variables (temperament, psychophysiology, genetics etc.) that have been evidenced to predict CP and CU behaviors. With specific regard to CU behaviors, there is strong support for the role of genetic heritability (Viding, Blair, Moffitt, & Plomin, 2005; Viding, Jones, Frick, Moffitt, & Plomin, 2008) as well as more recent studies examining potential gene  $\times$  environment effects (Willoughby, Mills-Koonce, Propper, & Waschbusch, 2013). Future studies would benefit from simultaneously considering both family and child biology given the coaction effects (see Gottlieb, 1992) they are likely to exert in the emergence of both CP and CU behaviors.

This study has several implications for future research in this domain. First, preliminary evidence of the utility of the Family Drawing Paradigm as both a research and clinical instrument is worth noting given that it is shorter and less expensive to administer than many other measures of relational representation at this age. The family drawing paradigm is a suitable tool for gaining insight into children's perceptions of their caregiving experiences and how these experiences are internalized across early childhood. However, given the modest but significant effects, it is possible that the overall utility of the FDP may vary based on the severity of family dysfunction of the sample. Second, consistent with previous research on this topic, we highlight the early caregiving environment and parent-child relationships as predictors of both CP and CU behaviors, findings of both scientific and societal significance given the monetary and societal costs incurred by individuals exhibiting high levels of antisocial behaviors over time (Romeo, Knapp, & Scott, 2006). This work

should prompt future studies better structured to address causal relationships including early intervention randomized designs which would provide stronger tests of these associations.

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## References

- Ainsworth, M.; Blehar, M.; Waters, E.; Wall, S. Patterns of attachment: A psychological study of the strange situation. Lawrence Erlbaum; Hillsdale, NJ: 1978.
- Bailey HN, Moran G, Pederson DR, Bento S. Understanding the transmission of attachment using variable- and relationship-centered approaches. *Development and Psychopathology*. 2007; 19:313–343. [PubMed: 17459173]
- Barker ED, Oliver BR, Viding E, Salekin RT, Maughan B. The impact of prenatal maternal risk, fearless temperament and early parenting on adolescent callous-unemotional traits: a 14-year longitudinal investigation. *Journal of Child Psychology and Psychiatry*. 2011; 52(8):878–88. doi: 10.1111/j.1469-7610.2011.02397.x. [PubMed: 21410472]
- Barkley, RA. Defiant children: A clinician's manual for assessment and parent training. 2nd ed.. Guilford; New York: 1997.
- Behrens KY, Hart SL, Parker AC. Maternal Sensitivity : Evidence of Stability across Time , Contexts , and Measurement Instruments. *Infant and Child Development*. 2012; 35:348–355. doi:10.1002/icd.
- Bishop, YM.; Fienberg, SE.; Holland, PW. Discrete multivariate analysis: Theory and practice. MIT Press; Cambridge, MA: 1975.
- Blair RJR, Peschardt KS, Budhani S, Mitchell DGV, Pine DS. The development of psychopathy. *Journal of Child Psychology and Psychiatry*. 2006; 47(3-4):262–276. [PubMed: 16492259]
- Blount-Matthews, KM.; Hertenstein, MJ. Encyclopedia of Human Development. SAGE; Thousand Oaks, CA: 2005. Attachment.; p. 127-134.
- Bohlin G, Eninger L, Brocki K, Thorell LB. Disorganized attachment and inhibitory capacity: Predicting externalizing problem behaviors. *Journal Of Abnormal Child Psychology*. 2012; 40(3): 449–458. doi:10.1007/s10802-011-9574-7. [PubMed: 21947617]
- Bowlby, J. Attachment. Vol. 1. Basic Books; New York: 1982. Attachment and loss.
- Bowlby, J. A secure base. Basic Books; New York: 1988.
- Bretherton, I.; Munholland, KA. Internal working models in attachment relationships: Elaborating a central construct in attachment theory.. In: Cassidy, J.; Shaver, P., editors. *Handbook of Attachment: Theory, research and clinical application*. 2nd ed.. Guilford; New York: 2008.
- Bretherton I. Attachment theory: Retrospect and prospect. *Monographs of the Society for Research in Child Development*. 1985; 50:3–35.
- Bretherton, I.; Oppenheim, D.; Prentiss, C.; Buchsbaum, H.; Emde, R.; Lundquist, A.; Ridgeway, D.; Watson, M.; Wolf, D.; Rubin, B.; Clyman, R. The MacArthur Story Stem Battery. 1990. Unpublished manuscript
- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit.. In: Bollen, KA.; Long, JS., editors. *Testing structural equation models*. Sage; Newbury Park, CA: 1993. p. 136-62.
- Burchinal M, Vernon-Feagans L, Cox M. Cumulative social risk, parenting, and infant development in rural low-income communities. *Parenting: Science And Practice*. 2008; 8(1):41–69. doi: 10.1080/15295190701830672.

- Burkitt E, Barrett M, Davis A. Children's colour choices for completing drawings of affectively characterised topics. *Journal of child psychology and psychiatry*. 2003; 44(3):445–455. [PubMed: 12635973]
- Cairns, R.; Magnusson, D. Developmental science: Toward a united framework.. In: Cairns, R.; Elder, G.; Costello, E., editors. *Developmental science*. Cambridge University Press; New York: 1996. p. 7-30.
- Carlson EA. A prospective longitudinal study of attachment disorganization/disorientation. *Child Development*. 1998; 69:1107–1129. [PubMed: 9768489]
- Cox MJ, Paley B, Burchinal M, Payne CC. Marital perceptions and interactions across the transition to parenthood. *Journal of Marriage and the Family*. 1999; 61:611–625. doi:10.2307/353564.
- Cox MJ, Paley B. Families as systems. *Annual Review of Psychology*. 1997; 48:243–67. doi:10.1146/annurev.psych.48.1.243.
- Dadds MR, Fraser J, Frost A, Hawes DJ. Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: A community study. *Journal of Consulting and Clinical Psychology*. 2005; 73(3):400–410. [PubMed: 15982138]
- Dadds MR, Jambak J, Pasalich D, Hawes DJ, Brennan J. Impaired attention to the eyes of attachment figures and the developmental origins of psychopathy. *Journal Of Child Psychology And Psychiatry*. 2011; 52(3):238–245. doi:10.1111/j.1469-7610.2010.02323.x. [PubMed: 20883520]
- Davies PT, Cummings EM. Exploring children's emotional security as a mediator of the link between marital relations and child adjustment. *Child Development*. 1998; 69:124–139. [PubMed: 9499562]
- De Wolff M, van IJzendoorn MH. Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*. 1997; 68(4):571–591. doi:10.2307/1132107. [PubMed: 9306636]
- Deater-Deckard K, Dodge KA. Externalizing behavior problems and discipline revisited: Nonlinear effects and variation by culture, context, and gender. *Psychological Inquiry*. 1997; 8(3):161–175.
- Dodge KA, Pettit GS. A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology*. 2003; 39:349–371. doi:10.1037/0012-1649.39.2.349. [PubMed: 12661890]
- Dunn J, O'Connor T, Levy I. Out of the picture: A study of family drawings by children from step-, single-parent, and non-step families. *Journal of Clinical Child and Adolescent Psychology*. 2002; 31:505–512. [PubMed: 12402569]
- Enders CK, Bandalos DL. The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*. 2001; 8:430–457. doi:10.1207/S15328007SEM0803\_5.
- Essau CA, Sasagawa S, Frick PJ. Callous-unemotional traits in a community sample of adolescents. *Assessment*. 2006; 13:454–469. [PubMed: 17050915]
- Ezpeleta L, Osa N, Granero R, Penelo E, Domènech JM. Inventory of Callous-Unemotional Traits in a community sample of preschoolers. *Journal Of Clinical Child And Adolescent Psychology*. 2013; 42(1):91–105. [PubMed: 23095075]
- Fanti KA, Frick PJ, Georgiou S. Linking callous–unemotional traits to instrumental and non-instrumental forms of aggression. *Journal of Psychopathology and Behavioral Assessment*. 2009; 31:285–298. doi:10.1007/s10862-008-9111-3.
- Fearon R, Bakermans-Kranenburg MJ, van IJzendoorn MH, Lapsley A, Roisman GI. The significance of insecure attachment and disorganization in the development of children s externalizing behavior: A meta-analytic study. *Child Development*. 2010; 81(2):435–456. doi:10.1111/j.1467-8624.2009.01405.x. [PubMed: 20438450]
- Fontaine NMG, McCrory EJP, Boivin M, Moffitt TE, Viding E. Predictors and outcomes of joint trajectories of callous-unemotional traits and conduct problems in childhood. *Journal of Abnormal Psychology*. 2011; 120(3):730–42. doi:10.1037/a0022620. [PubMed: 21341879]
- Fraley RC. Attachment stability from infancy to adulthood: Meta-analysis and dynamic modeling of developmental mechanisms. *Personality and Social Psychology Review*. 2002; 6(2):123–151.
- Frick, PJ.; Hare, RD. *The Psychopathy Screening Device*. Multi-Health Systems; Toronto, Ontario, Canada: 2002.



- Frick PJ, Ray JV, Thornton LC, Kahn RE. Annual research review: A developmental psychopathology approach to understanding callous-unemotional traits in children and adolescents with serious conduct problems. *Journal of Child Psychology and Psychiatry*. 2014; 55(6):532–48. doi:10.1111/jcpp.12152. [PubMed: 24117854]
- Frick, PJ. The Inventory of Callous-unemotional Traits. University of New Orleans; 2004. Unpublished rating scale
- Frick PJ, White SF. Research review: The importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology and Psychiatry*. 2008; 49(4):359–375. [PubMed: 18221345]
- Frick PJ, Viding E. Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*. 2009; 21(4):1111–1131. doi:10.1017/S0954579409990071. [PubMed: 19825260]
- Frick PJ, Cornell AH, Bodin S, Dane HE, Barry CT, Loney BR. Callous-unemotional traits and developmental pathways to severe conduct problems. *Developmental Psychology*. 2003; 39(2): 246–260. doi:10.1037/0012-1649.39.2.246. [PubMed: 12661884]
- Fury G, Carlson EA, Sroufe LA. Children's Representations of Attachment Relationships in Family Drawings. *Child Development*. 1997; 68(6):1154–1164. [PubMed: 9418231]
- Goldner L, Scharf M. Children's family drawings and internalizing problems. *The Arts In Psychotherapy*. 2012; 39(4):262–271. doi:10.1016/j.aip.2012.04.005.
- Goodman R. The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry*. 1997; 38:581–586. [PubMed: 9255702]
- Gottlieb, G. Individual development and evolution: The genesis of novel behavior. Oxford University Press; New York, NY US: 1992.
- Gottlieb G, Halpern C. A relational view of causality in normal and abnormal development. *Development and Psychopathology*. 2002; 14(3):421–435. [PubMed: 12349867]
- Green J, Goldwyn R. Annotation: Attachment disorganization and psychopathology: new findings in attachment research and their potential implications for developmental psychopathology in childhood. *Journal Of Child Psychology And Psychiatry*. 2002; 43(7):835–846. doi: 10.1111/1469-7610.00102. [PubMed: 12405473]
- Green J, Stanley C, Smith V, Goldwyn R. A new method of evaluating attachment representations in the young school-age children: The Manchester Child Attachment Story Task (MCAST). *Attachment & Human Development*. 2000; 2(1):48–70. doi:10.1080/146167300361318. [PubMed: 11707892]
- Grych JH, Wachsmuth-Schlaefter T, Klockow LL. Interparental aggression and young children's representations of family relationships. *Journal of Family Psychology*. 2002; 16:259–272. [PubMed: 12238409]
- Haltigan JD, Roisman GI, Fraley RC. The predictive significance of early caregiving experiences for symptoms of psychopathology through midadolescence: enduring or transient effects? *Development and Psychopathology*. 2013; 25(1):209–21. doi:10.1017/S0954579412000260. [PubMed: 22800694]
- Hawes DJ, Dadds MR. The treatment of conduct problems in children with callous-unemotional traits. *Journal of Consulting and Clinical Psychology*. 2005; 73(4):737–741. [PubMed: 16173862]
- Hawes DJ, Dadds MR, Frost AJ, Hasking PA. Do childhood callous-unemotional traits drive change in parenting practices? *Journal Of Clinical Child And Adolescent Psychology*. 2011; 40(4):507–518. doi:10.1080/15374416.2011.581624. [PubMed: 21722024]
- Hawes DJ, Brennan J, Dadds MR. Cortisol, callous-unemotional traits, and pathways to antisocial behavior. *Current Opinion In Psychiatry*. 2009; 22(4):357–362. doi:10.1097/YCO.0b013e32832bfa6d. [PubMed: 19455037]
- Hendrickson AE, White P. Promax: A quick method for rotation to oblique simple structure. *British Journal Of Statistical Psychology*. 1964; 17(1):65–70. doi:10.1111/j.2044-8317.1964.tb00244.x.
- Hoeve M, Stams GM, Put CE, Dubas J, Laan PH, Gerris JM. A meta-analysis of attachment to parents and delinquency. *Journal Of Abnormal Child Psychology*. 2012; 40(5):771–785. doi:10.1007/s10802-011-9608-1. [PubMed: 22278802]

- Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional versus new alternatives. *Structural Equation Modeling*. 1999; 6:1–55. doi:10.1080/10705519909540118.
- Kaplan, N.; Main, M. Instructions for the classification of children's family drawings in terms of representation of attachment. University of California; Berkeley: 1986.
- Kiang L, Moreno A, Robinson J. Maternal preconceptions about parenting predict child temperament, maternal sensitivity, and children's empathy. *Developmental Psychology*. 2004; 40:1081–1092. [PubMed: 15535758]
- Kimonis ER, Frick PJ, Skeem JL, Marsee MA, Cruise K, Munoz LC, Aucoin KJ, Morris AS. Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. *International Journal of Law and Psychiatry*. 2008; 31:241–252. [PubMed: 18514315]
- Kimonis ER, Cross B, Howard A, Donoghue K. Maternal care, maltreatment and callous-unemotional traits among urban male juvenile offenders. *Journal of Youth and Adolescence*. 2013; 42(2):165–177. [PubMed: 23054349]
- Kochanska G. Mutually responsive orientation between mothers and their young children: Implications for early socialization. *Child Development*. 1997; 68(1):94–112. doi:10.2307/1131928. [PubMed: 9084128]
- Kochanska G, Aksan N, Knaack A, Rhines HM. Maternal Parenting and Children's Conscience: Early Security as Moderator. *Child Development*. 2004; 75(4):1229–1242. doi:10.1111/j.1467-8624.2004.00735.x. [PubMed: 15260874]
- Kochanska G, Kim S, Boldt LJ, Yoon J. Children's callous-unemotional traits moderate links between their positive relationships with parents at preschool age and externalizing behavior problems at early school age. *Journal Of Child Psychology And Psychiatry*. 2013; 54(11):1251–1260. [PubMed: 23639120]
- Kochanska G, Gross JN, Lin MH, Nichols KE. Guilt in young children: Development, determinants, and relations with a broader system of standards. *Child Development*. 2002; 73:461–482. [PubMed: 11949903]
- Kochanska G, Barry RA, Stellern SA, O'Bleness JJ. Early attachment organization moderates the parent–child mutually coercive pathway to children's antisocial conduct. *Child Development*. 2009; 80(4):1288–1300. doi:10.1111/j.1467 8624.2009.01332.x. [PubMed: 19630909]
- Kochanska G, Forman DR, Aksan N, Dunbar SB. Pathways to conscience: early mother-child mutually responsive orientation and children's moral emotion, conduct, and cognition. *Journal of Child Psychology and Psychiatry*. 2005; 46(1):19–34. doi:10.1111/j.1469-7610.2004.00348.x. [PubMed: 15660641]
- Koppitz, EM. Psychological evaluation of children's human figure drawing. Grune & Stratton; New York, NY: 1968.
- Kotler JS, McMahon RJ. Child psychopathy: Theories, measurement, and relations with the development and persistence of conduct problems. *Clinical Child and Family Psychology Review*. 2005; 8(4):291–325. [PubMed: 16362257]
- Knafo A, Zahn-Waxler C, Van Hulle C, Robinson JL, Rhee SH. The developmental origins of a disposition toward empathy: Genetic and environmental contributions. *Emotion*. 2008; 8:737–752. doi:10.1037/a0014179. [PubMed: 19102585]
- Kroneman LM, Hipwell AE, Loeber R, Koot HM, Pardini DA. Contextual risk factors as predictors of disruptive behavior disorder trajectories in girls: The moderating effect of callous-unemotional features. *Journal Of Child Psychology And Psychiatry*. 2011; 52(2):167–175. doi:10.1111/j.1469-7610.2010.02300.x. [PubMed: 20735513]
- Laible D, Thompson RA. Early Socialization. *Handbook of socialization: Theory and research*. 2007:181.
- Laible D, Carlo G, Torquati J, Ontai L. Children's perceptions of family relationships as assessed in a doll story completion task: Links to parenting, social competence, and externalizing behavior. *Social Development*. 2004; 13:551–569.
- Leon K, Wallace T, Rudy D. Representations of parent-child alliances in children's family drawings. *Social Development*. 2007; 16(3):440–459.

- Little R. A test of missing completely at random for multivariate data with missing values. *Journal of American Statistical Association*. 1988; 83(404):1198–1202.
- Loeber R, Hay D. Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review Of Psychology*. 1997;48:371–410. doi:10.1146/annurev.psych.48.1.371.
- Loney BR, Butler MA, Lima EN, Counts CA, Eckel LA. The relation between salivary cortisol, callous-unemotional traits, and conduct problems in an adolescent non-referred sample. *Journal Of Child Psychology And Psychiatry*. 2006; 47(1):30–36. doi:10.1111/j.1469-7610.2005.01444.x. [PubMed: 16405638]
- Lorber MF. Psychophysiology of aggression, psychopathy, and conduct problems: a meta-analysis. *Psychological Bulletin*. 2004; 130:531–552. doi:10.1037/0033-2909.130.4.531. [PubMed: 15250812]
- Lorber MF, Egeland B. Infancy parenting and externalizing psychopathology from childhood through adulthood: developmental trends. *Developmental Psychology*. 2009; 45(4):909–912. doi:10.1037/a0015675. [PubMed: 19586169]
- Lynam DR, Caspi A, Moffitt TE, Loeber R, Stouthamer-Loeber M. Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal Of Abnormal Psychology*. 2007; 116(1):155–165. doi:10.1037/0021-843X.116.1.155. [PubMed: 17324026]
- Lyons-Ruth K. Attachment relationships among children with aggressive behavior problems: The role of disorganized early attachment patterns. *Journal of Consulting and Clinical Psychology*. 1996; 64:64–73. [PubMed: 8907085]
- Madigan S, Bakermans-Kranenburg MJ, Van Ijzendoorn MH, Moran G, Pederson DR, Benoit D. Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development*. 2006; 8(2):89–111. doi:10.1080/14616730600774458. [PubMed: 16818417]
- Madigan S, Moran G, Pederson DR. Unresolved states of mind, disorganized attachment relationships, and disrupted interactions of adolescent mothers and their infants. *Developmental Psychology*. 2006; 42(2):293–304. doi:10.1037/0012-1649.42.2.293. [PubMed: 16569168]
- Madigan S, Ladd M, Goldberg S. A picture is worth a thousand words: Children's representations of family as indicators of early attachment. *Attachment & Human Development*. 2003; 5(1):19–37. doi:10.1080/1461673031000078652. [PubMed: 12745827]
- Madigan S, Moran G, Schuengel C, Pederson DR, Otten R. Unresolved maternal attachment representations, disrupted maternal behavior and disorganized attachment in infancy: Links to toddler behavior problems. *Journal Of Child Psychology And Psychiatry*. 2007; 48(10):1042–1050. doi:10.1111/j.1469-7610.2007.01805.x. [PubMed: 17915005]
- Marsh AA, Finger EC, Mitchell DG, Reid ME, Sims C, Kosson DS, Twobin KE, Leibenluft E, Pine DS, Blair RJ. Reduced amygdale response to fearful expressions in children and adolescents with callous-unemotional traits and disruptive behavior disorders. *American Journal of Psychiatry*. 2008; 165:712–720. [PubMed: 18281412]
- Mills-Koonce WR, Wagner NJ, Willoughby MT, Stifter C, Blair C, Granger D. a. Greater fear reactivity and psychophysiological hyperactivity among infants with later conduct problems and callous-unemotional traits. *Journal of Child Psychology and Psychiatry*. 2014 doi:10.1111/jcpp.12289.
- Morsbach S, Prinz R. Understanding and improving the validity of self-report of parenting. *Clinical Child and Family Psychology Review*. 2006; 9:1–21. [PubMed: 16636897]
- Muthén, LK.; Muthén, BO. *Mplus user's guide*. 5th ed.. Author; Los Angeles, CA: 2010.
- Newton EK, Laible D, Carlo G, Steele JS, McGinley M. Do sensitive parents foster kind children, or vice versa? Bidirectional influences between children's prosocial behavior and parental sensitivity. *Developmental Psychology*. 2014; 50(6):1808–16. doi:10.1037/a0036495. [PubMed: 24708456]
- NICHD Early Child Care Research Network. The effects of infant child care on infant–mother attachment security: Results of the NICHD Study of Early Child Care. *Child Development*. 1997; 68:860–879.
- NICHD Early Child Care Research Network. Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months. *Developmental Psychology*. 1999; 35:1297–1310. doi:10.1037/0012-1649.35.5.1297. [PubMed: 10493655]

- NICHD Early Child Care Research Network. Infant–mother attachment classifications: Risk and protection in relation to changing maternal caregiving quality. *Developmental Psychology*. 2006; 42:38–58. [PubMed: 16420117]
- Oppenheim D. Child, parent, and parent– child emotion narratives: Implications for developmental psychopathology. *Development and Psychopathology*. 2006; 18:771–790. [PubMed: 17152400]
- Oxford M, Cavell TA, Hughes JN. Callous/unemotional traits moderate the relation between ineffective parenting and child externalizing problems: A partial replication and extension. *Journal of Clinical Child and Adolescent Psychology*. 2003; 32:577–85. [PubMed: 14710466]
- Panfile TM, Laible DJ. Attachment Security and Child's Empathy: The Mediating Role of Emotion Regulation. *Merrill-Palmer Quarterly*. 2012; 58(1):1–21. doi:10.1353/mpq.2012.0003.
- Pardini DA, Lochman JE, Powell N. The development of callous-unemotional traits and antisocial behavior in children: Are there shared and/or unique predictors?. *Journal Of Clinical Child And Adolescent Psychology*. 2007; 36(3):319–333. doi:10.1080/15374410701444215. [PubMed: 17658977]
- Pasalich DS, Dadds MR, Hawes DJ, Brennan J. Attachment and callous unemotional traits in children with early-onset conduct problems. *Journal Of Child Psychology And Psychiatry*. 2012; 53(8): 838–845. doi:10.1111/j.1469-7610.2012.02544.x. [PubMed: 22394435]
- Pasalich DS, Dadds MR, Hawes DJ, Brennan J. Do callous-unemotional traits moderate the relative importance of parental coercion versus warmth in child conduct problems? An observational study. *Journal Of Child Psychology And Psychiatry*. 2011; 52(12):1308–1315. doi:10.1111/j.1469-7610.2011.02435.x. [PubMed: 21726225]
- Patterson, GR. The early development of coercive family process.. In: Reid, JB.; Patterson, GR.; Snyder, J., editors. *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention*. American Psychological Association; Washington, DC US: 2002. p. 25-44. doi:10.1037/10468-002
- Pederson DR, Moran G. Expressions of the attachment relationship outside of the Strange Situation. *Child Development*. 1996; 67(3):915–927. doi:10.2307/1131870. [PubMed: 8706535]
- Pelham WE, Gnagy EM, Greenslade KE, Milich R. Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1992; 20:83–102.
- Pelletier J, Collett B, Gimpel G, Crowley S. Assessment of Disruptive Behaviors in Preschoolers: Psychometric Properties of the Disruptive Behavior Disorders Rating Scale and School Situations Questionnaire. *Journal Of Psychoeducational Assessment*. 2006; 24(1):3–18. doi: 10.1177/0734282905285235.
- Pianta RC, Longmaid K, Ferguson JE. Attachment-based classifications of children's family drawings: Psychometric properties and relations with children's adjustment in kindergarten. *Journal Of Clinical Child Psychology*. 1999; 28(2):244–255. doi:10.1207/s15374424jccp2802\_11. [PubMed: 10353083]
- Piperno F, Di Biasi S, Levi G. Evaluation of family drawings of physically and sexually abused children. *European Child & Adolescent Psychiatry*. 2007; 16(6):389–397. doi:10.1007/s00787-007-0611-6. [PubMed: 17401609]
- Rigdon EE. CFI Versus RMSEA: A comparison of two fit indexes for structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*. 1996; 3(4):369–379. DOI: 10.1080/10705519609540052.
- Rimehaug T, Wallander J, Berg-Nielsen TS. Group and individual stability of three parenting dimensions. *Child and Adolescent Psychiatry and Mental Health*. 2011; 5(1):19. doi: 10.1186/1753-2000-5-19. [PubMed: 21609442]
- Robinson J, Mantz-Simmons L, Macfie J, the MacArthur Narrative Working Group. The MacArthur narrative coding manual. 1992 Unpublished manuscript.
- Roe A, Bridges L, Dunn J, O'Connor TG. Young children's representations of their families: A longitudinal follow-up study of family drawings by children living in different family settings. *International Journal Of Behavioral Development*. 2006; 30(6):529–536. doi: 10.1177/0165025406072898.

- Roose A, Bijttebier P, Decoene S, Claes L, Frick PJ. Assessing the affective features of psychopathy in adolescence: a further validation of the Inventory of Callous and Unemotional Traits. *Assessment*. 2011; 17(1):44–57. [PubMed: 19797326]
- Romeo R, Knapp M, Scott S. Economic cost of severe antisocial behavior in children--And who pays it. *The British Journal Of Psychiatry*. 2006; 188(6):547–553. doi:10.1192/bjp.bp.104.007625. [PubMed: 16738345]
- Rowe R, Maughan B, Moran P, Ford T, Briskman J, Goodman R. The role of callous and unemotional traits in the diagnosis of conduct disorder. *Journal Of Child Psychology And Psychiatry*. 2010; 51(6):688–695. doi:10.1111/j.1469-7610.2009.02199.x. [PubMed: 20039995]
- Rutter M, Kreppner J, Sonuga-Barke E. Emanuel Miller lecture: Attachment insecurity, disinhibited attachment, and attachment disorders: Where do research findings leave the concepts? *Journal Of Child Psychology And Psychiatry*. 2009; 50(5):529–543. doi:10.1111/j.1469-7610.2009.02042.x. [PubMed: 19298474]
- Sattler, JM. *Assessment of Children: Cognitive Applications*. Fourth Edition.. Satter Publisher, Inc.; San Diego: 2001.
- Sattler, JM. *Assessment of Children: Cognitive Applications*. Fourth Edition.. Satter Publisher, Inc.; San Diego: 2001.
- Schudlich TD, Shamir H, Cummings EM. Marital conflict, children's representations of family relationships, and children's dispositions towards peer conflict strategies. *Social Development*. 2004; 13(2):171–192.
- Shaffer A, Lindhiem O, Kolko DJ, Trentacosta CJ. Bidirectional relations between parenting practices and child externalizing behavior: A cross-lagged panel analysis in the context of a psychosocial treatment and 3-year follow-up. *Journal Of Abnormal Child Psychology*. 2013; 41(2):199–210. doi:10.1007/s10802-012-9670-3. [PubMed: 22821450]
- Shamir H, DuRocher Schudlich T, Cummings EM. Marital conflict, parenting styles, and children's representations of family relationships. *Parenting*. 2001; 2:123–151.
- Shiakou M. Representations of attachment patterns in the family drawings of maltreated and non-maltreated children. *Child Abuse Review*. 2012; 21(3):203–218. doi:10.1002/car.1184.
- Solomon, J.; George, C. The measurement of Attachment Security in infancy and childhood.. In: Cassidy, J.; Shaver, P., editors. *The handbook of Attachment. Theory, research and clinical applications*. The Guilford Press; New York: 1999. p. 287-316.
- Sroufe, L.; Egeland, B.; Carlson, EA.; Collins, W. *The development of the person: The Minnesota study of risk and adaptation from birth to adulthood*. Guilford Publications; New York, NY US: 2005.
- Stern, D. *The interpersonal world of the infant*. Basic Books; New York: 1985.
- Sturge-Apple ML, Davies PT, Winter MA, Cummings E, Schermerhorn A. Interparental conflict and children's school adjustment: The explanatory role of children's internal representations of interparental and parent-child relationships. *Developmental Psychology*. 2008; 44(6):1678–1690. doi:10.1037/a0013857. [PubMed: 18999330]
- Swain JE, Lorberbaum JP, Kose S, Strathearn L. Brain basis of early parent-infant interactions: Psychology, physiology, and in vivo functional neuroimaging studies. *Journal of Child Psychology and Psychiatry*. 2007; 48(3):262–287. [PubMed: 17355399]
- Thompson, R. *Social, emotional, and personality development*. 6th ed.. Vol. 3. John Wiley & Sons Inc.; Hoboken, NJ, US: 2006. *The Development of the Person: Social Understanding, Relationships, Conscience, Self*. Handbook of child psychology; p. 24-98.
- Thompson RA. Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*. 1994; 59(2–3):25–52. 250–283. [PubMed: 7984164]
- van Ijzendoorn MH, Schuengel C, Bakermans-Kranenburg MJ. Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development And Psychopathology*. 1999; 11(2):225–249. doi:10.1017/S0954579499002035. [PubMed: 16506532]
- Vando J, Rhule-Louie DM, McMahon RJ, Spieker SJ. Examining the link between infant attachment and child conduct problems in grade 1. *Journal Of Child And Family Studies*. 2008; 17(5):615–628. doi:10.1007/s10826-007-9173-y.

- Viding E, Blair RJR, Moffitt TE, Plomin R. Evidence for substantial genetic risk for psychopathy in 7-year-olds. *Journal of Child Psychology and Psychiatry*. 2005; 46(6):592–597. [PubMed: 15877765]
- Viding E, McCrory EJ. Why should we care about measuring callous-unemotional traits in children? *The British Journal of Psychiatry*. 2012; 200(3):177–8. doi:10.1192/bjp.bp.111.099770. [PubMed: 22383762]
- Viding E, Jones AP, Frick PJ, Moffitt TE, Plomin R. Heritability of antisocial behavior at 9: Do callous-unemotional traits matter? *Developmental Science*. 2008; 11(1):17–22. [PubMed: 18171362]
- Viding E, Fontaine NG, Oliver BR, Plomin R. Negative parental discipline, conduct problems and callous-unemotional traits: Monozygotic twin differences study. *The British Journal Of Psychiatry*. 2009; 195(5):414–419. doi:10.1192/bjp.bp.108.061192. [PubMed: 19880931]
- Waller R, Gardner F, Hyde LW. What are the associations between parenting, callous-unemotional traits, and antisocial behavior in youth? A systematic review of evidence. *Clinical Psychology Review*. 2013; (33):593–608. [PubMed: 23583974]
- Waller R, Gardner F, Hyde LW, Shaw DS, Dishion TJ, Wilson MN. Do harsh and positive parenting predict parent reports of deceitful callous behavior in early childhood? *Journal Of Child Psychology And Psychiatry*. 2012; 53(9):946–953. doi:10.1111/j.1469-7610.2012.02550.x. [PubMed: 22490064]
- Waller R, Gardner F, Viding E, Shaw DS, Dishion TJ, Wilson MN, Hyde LW. Bidirectional associations between parental warmth, callous unemotional behavior, and behavior problems in high-risk preschoolers. *Journal Of Abnormal Child Psychology*. 2014 doi:10.1007/s10802-014-9871-z.
- Warren SL, Emde RN, Sroufe L. Internal representations: Predicting anxiety from children's play narratives. *Journal Of The American Academy Of Child & Adolescent Psychiatry*. 2000; 39(1):100–107. doi:10.1097/00004583-200001000-00022. [PubMed: 10638073]
- Wechsler, D. Wechsler Preschool and Primary Scale of Intelligence (WPPSI-III). Third Edition. The Psychological Corporation; 2002.
- Willoughby MT, Mills-Koonce WR, Propper CB, Waschbusch D. Observed parenting behaviors interact with a polymorphism of the brain derived neurotrophic factor gene to predict the emergence of oppositional defiant and callous unemotional behaviors at age 3 years. *Development and Psychopathology*. 2013; (25):903–917. [PubMed: 24229538]
- Willoughby MT, Mills-Koonce WR, Gottfredson NC, Wagner NJ. Measuring callous unemotional behaviors in early childhood: Factor structure and the prediction of stable aggression in middle childhood. *Journal of Psychopathology and Behavioral Assessment*. 2014; 36(1):30–42. [PubMed: 24729655]
- Willoughby MT, Waschbusch DA, Moore GA, Propper CB. Using the ASEBA to screen for callous unemotional traits in early childhood: Factor structure, temporal stability, and utility. *Journal Of Psychopathology And Behavioral Assessment*. 2011; 33(1):19–30. doi:10.1007/s10862-010-9195-4. [PubMed: 21483647]
- Willoughby M, Burchinal M, Garrett-Peters P, Mills-Koonce WR, Vernon-Feagans L, Cox M. The Family Life Project: An Epidemiological and Developmental Study of Young Children Living in Poor Rural Communities; Chapter II: Recruitment of the Family Life Project sample. *Monographs of the Society for Research in Child Development*. 2013; 78(5):24–35.
- Wolf, DP. Making meaning from emotional experience in early narratives. Oxford University Press; New York: 2003.
- Wootton JM, Frick PJ, Shelton KK, Silverthorn P. Ineffective parenting and childhood conduct problems: the moderating role of callous-unemotional traits. *Journal of Consulting and Clinical Psychology*. 1997; 65:301–308. [PubMed: 9086694]
- Wright KD, Waschbusch DA, Frankland BW. Combining data from parent ratings and parent interview when assessing ADHD. *Journal of Psychopathology and Behavioral Assessment*. 2007; 29(3):141–148. doi: 10.1007/s10862-006-9039-4.

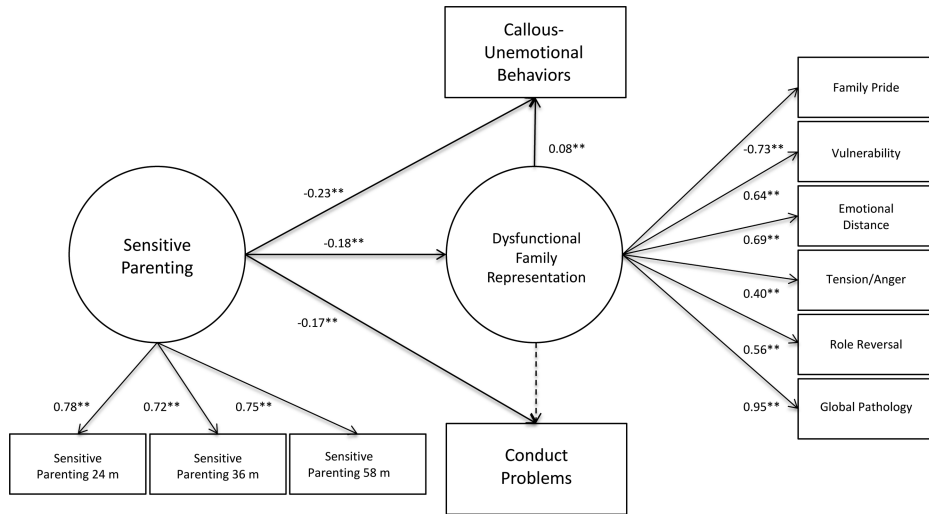
- Zeanah CH, Berlin LJ, Boris NW. Practitioner review: Clinical applications of attachment theory and research for infants and young children. *Journal Of Child Psychology And Psychiatry*. 2011; 52(8):819–833. doi:10.1111/j.1469-7610.2011.02399.x. [PubMed: 21554304]
- Zvara BJ, Mills-Koonce WR, Garrett-Peters P, Wagner NJ, Vernon-Feagans L, Cox M. The mediating role of parenting in the associations between household chaos and children's representations of family dysfunction. *Attachment & Human Development*. 2014; 16(6):633–55. doi:10.1080/14616734.2014.966124. [PubMed: 25329862]

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**Figure 1.** SEM model and standardized parameters of relations between sensitive parenting in early childhood, representations of family dysfunction, conduct problems, and callous-unemotional behaviors. Although not depicted here, the effects of sensitive parenting and dysfunctional family representations on CP and CU behaviors in first grade are significant above and beyond earlier CP and CU behaviors. Exogenous covariates (child's sex, IQ, age in months at the 1<sup>st</sup> grade visit) are not included in the diagram but were allowed to covary. Child race, state of residency, and family income were accounted for using individual probability weights and stratification variables. The model provides acceptable fit to the data:  $X^2(77) = 228.18, p = 0.00; CFI = 0.96; RMSEA = 0.04; SRMR = 0.03.$



Table 1

Means, Standard Deviations, and Zero-order Bivariate Correlation among Model Covariates.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Income-to-Needs <sup>^</sup>	-																			
2. Race (AA = 1)	-.37**	-																		
3. Gender (Female = 1)	-.05	.01	-																	
4. State (PA = 1)	.24**	-.61**	-.07*	-																
IQ	.38**	-.37**	.16**	.28**	-															
Age in Months (1 <sup>st</sup> )	.06*	-.17**	.02	.05	.13**	-														
CU Behaviors (48m)	-.15**	.08*	-.07*	-.02	-.21**	.064	-													
CP (48m)	-.20**	.13**	-.07*	-.06*	-.19**	-.01	.32**	-												
Sensitive Parenting (24m)	.40**	-.35**	.03	.23**	.43**	.07*	-.21**	-.24**	-											
Sensitive Parenting (36m)	.32**	-.35**	.06*	.27**	.34**	.04	-.22**	-.26**	.57**	-										
Sensitive Parenting (58m)	.46**	-.38**	.02	.25**	.36**	.02	-.17**	-.22**	.57**	.59**	-									
Family Pride	.10**	-.18**	.16	.08**	.18**	.06	-.07*	-.05	.10**	.15**	.12**	-								
Vulnerability	-.09**	.15**	-.07*	-.09**	-.14**	-.04	.06*	.09**	-.09**	-.09**	-.13**	-.55**	-							
Emotional Distance	-.12**	.18**	-.07*	-.10**	-.16**	.02	.05	.08**	-.06**	-.11**	-.13**	-.58**	.73**	-						
Tension/Anger	-.04	.06	-.12**	.01	-.09**	-.03	.04	.09**	-.05**	-.09**	-.06**	-.34**	.28**	.21**	-					
Role Reversal	-.12**	.17**	-.03	-.09**	-.18**	.03	.08*	.08**	-.13**	-.17**	-.17**	-.37**	.44**	.65**	.17**	-				
Global Pathology	-.12**	.16**	-.14**	-.03	-.20**	.01	.10*	.10**	-.12**	-.18**	-.16**	-.71**	.68**	.76**	.45**	.65**	-			
CU Behaviors (1 <sup>st</sup> )	-.20**	.15**	-.10**	-.11**	-.25**	-.04	.36**	.39**	-.25**	-.23**	-.24**	-.11**	.07**	.10**	.05**	.12**	.15**	-		
CP (1 <sup>st</sup> )	-.14**	-.02	-.04	.06	-.11**	-.03	.17**	.41**	-.17**	-.15**	-.12**	-.08**	.10**	.06**	.08**	.07**	.11**	.49**	-	
Number	1236	1239	1239	1239	1053	956	1061	1061	1055	1055	963	954	954	954	954	954	954	1080	1078	
Means	1.85	0.43	0.49	0.40	93.57	86.74	0.62	0.44	4.02	4.18	3.37	3.12	1.82	2.19	1.65	1.93	2.10	0.68	0.27	
Standard Deviation	1.43	-	-	-	16.49	3.30	0.34	0.34	1.31	1.20	1.23	1.13	1.05	1.24	0.76	1.20	1.01	0.42	0.36	

Note

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\*  
p < .05  
\*\*

p < .01.

^ income-to-needs is reported as a mean from 24 to 72 months; PA = Pennsylvania ; AA = African American; The means for #s 2, 3, and 4 reflect percentages.

Table 2

Standardized Parameter Estimates for the Full SEM

	$\beta$	SE
Child Sex → CP	-0.03	0.031
Child IQ → CP	0.01	0.040
Age at 1 <sup>st</sup> Grade Visit → CP	-0.04	0.032
Conduct Problems (48 m) → CP	0.27 <sup>***</sup>	0.032
Sensitive Parenting → CP	-0.17 <sup>***</sup>	0.049
DFR → CP	0.05	0.037
Child Sex → CU Behaviors	-0.07 <sup>*</sup>	0.030
Child IQ → CU Behaviors	-0.06	0.041
Age at 1 <sup>st</sup> Grade Visit → CU Behaviors	-0.04	0.031
CU Behaviors (48 m) → CU Behaviors	0.27 <sup>**</sup>	0.032
Sensitive Parenting → CU Behaviors	-0.23 <sup>**</sup>	0.044
DFR → CU Behaviors	0.08 <sup>**</sup>	0.035
Target Child's Sex → DFR	-0.17 <sup>***</sup>	0.033
Target Child's IQ → DFR	-0.10 <sup>***</sup>	0.046
Age at Collection (1 <sup>st</sup> grade) → DFR	0.05	0.040
Sensitive Parenting → DFR	-0.18 <sup>***</sup>	0.046
<i>Indirect Effects from Parenting → DFR → CU Behaviors</i>		
Total	-0.24 <sup>***</sup>	0.043
Direct	-0.22 <sup>***</sup>	0.044
Indirect	-0.02 <sup>*</sup>	0.007
<i>Indirect Effects from Parenting → DFR → CP</i>		

	$\beta$	SE
Total	-.17**	0.048
Direct	-.16**	0.049
Indirect	-.01	0.007

Notes: Standardized coefficients rounded to the nearest hundredths place; DFR = Dysfunctional Family Representation; CP = conduct problems; CU = callous-unemotional behaviors

\*  $p < .05$

\*\*  $p < .01$ .