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Family Instability and Young Children's School Adjustment: Callousness and Negative Internal Representations as Mediators

Jesse L. Coe, Patrick T. Davies, and Melissa L. Sturge-Apple

University of Rochester

Abstract

This study examined the mediating roles of children's callousness and negative internal representations of family relationships in associations between family instability and children's adjustment to school in early childhood. Participants in this multi-method (i.e., survey, observations), multi-informant (i.e., parent, teacher, observer), longitudinal study included 243 preschool children (*M age* = 4.60 years) and their families. Findings from the lagged, autoregressive tests of the mediational paths indicated that both children's callousness and negative internal representations of family relationships mediated longitudinal associations between family instability and children's school adjustment problems over a 2-year period (i.e., the transition from preschool to first grade). Findings are discussed in relation to the attenuation hypothesis (Susman, 2006) and emotional security theory (Davies, Winter, & Cicchetti, 2006).

Family instability is conceptualized as heightened exposure to events that disrupt the continuity, consistency, and predictability in family life for children (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999). Given the disruptiveness of these events, particularly those related to family relationships (e.g., changes in caregivers, caregiver intimate relationship changes, death of close family members), the cumulative frequency of unstable events has been associated with children's heightened risk for an array of behavioral, emotional, and psychological problems (e.g., Ackerman et al., 1999; Bachman, Coley, & Carrano, 2011; Cavanagh & Huston, 2006, 2008). However, relatively little research has taken a process-oriented approach to understanding the mechanisms through which family instability increases children's risk for psychological problems (e.g., Donahue et al., 2010; Forman & Davies, 2003). More specifically, little is known about the specific pathogenic processes family instability may set in motion for children that serve to alter their developmental outcomes.

To address this gap, our goal in this paper was to provide one of the first longitudinal tests of the child mechanisms that mediate associations between family instability and children's school adjustment problems during early childhood and the transition to formal educational settings. Early childhood is regarded as a period of heightened risk for children experiencing

Correspondence concerning this article should be addressed to Jesse L. Coe, Department of Clinical and Social Sciences in Psychology, University of Rochester, Rochester, New York, 14627. jesse.coe@rochester.edu. Telephone: 585-276-5733. Fax: 585-273-1100.

Jesse L. Coe, Patrick T. Davies, & Melissa L. Sturge-Apple, Department of Clinical and Social Sciences in Psychology, University of Rochester.

high levels of instability. During this period, children are theorized to not only form expectancies about the consistency of caregivers, but also broader concerns about the stability and health of relationships between caregivers (Bachman et al., 2011; Cicchetti, Cummings, Greenberg, & Marvin, 1990; Sroufe, 2000). Consistent with these conceptualizations, exposure to family instability in early childhood has been shown to be a more consistent and stronger predictor of psychological problems in later childhood and adolescence than assessments of instability later in childhood (Cavanagh & Huston, 2008; Simpson, Griskevicius, Kuo, Sung, & Collins, 2012). Thus, we specifically examine children's callousness and negative internal representations of family relationships as explanatory mechanisms in the prospective association between their exposure to family instability and school problems in early childhood.

Callousness as a Mediator of Family Instability

The composition and developmental characteristics of callousness in early childhood support its hypothesized candidacy as a mediator of risks associated with family adversity. Callousness is defined as a trait characterized by a lack of guilt, empathy, and connectedness to others (Frick & White, 2008) and first emerges as a coherent behavioral pattern during early childhood (Kimonis et al., 2006; Willoughby, Waschbusch, Moore, & Propper, 2011). As a result, the onset of a canalization process (see Gottlieb, 1991) is proposed to begin during this period. That is, plasticity and change in callousness are regarded as still operating, particularly in response to socialization experiences (Dackis, Rogosch, & Cicchetti, 2015; Frick & White, 2008). By the same token, its emergence as a coherent trait is also reflected in its increasing stability over time (Pardini, Obradovic, & Loeber, 2006). The underlying continuity in individual differences in callousness, in turn, is proposed to have significant implications for children's functioning over time.

Despite general developmental support for the role of callousness as a mediator of family adversity (e.g., Dackis et al., 2015; Frick & White, 2008), questions remain as to why family instability would specifically increase children's vulnerability to school problems by engendering callousness. According to the attenuation hypothesis (Susman, 2006), repeated exposure to chaotic, unstable, and unpredictable family events may engender callous traits by disrupting the ability of the limbic system to decipher the emotional meaning and significance of interpersonal relationships. Although considerable emphasis is placed on biological mechanisms in the attenuation hypothesis, a central aim of the theory is to advance an understanding of how callousness develops at both psychological and physiological levels of analysis. Therefore, the focus of our study was to examine the psychological manifestation (i.e., callousness) of underlying physiological processes. In further building on the seminal psychobiological conceptualization of callousness in the attenuation hypothesis, emotional security theory (EST; Davies & Martin, 2013) also provides an elaboration on the psychological sources of attenuation. Specifically, EST proposes that in order to attain a sense of emotional security in the context of family adversity, some children may suppress both the personal significance of family relationships as well as their own vulnerable affective responses (e.g., fear, distress) to stressors in the family. Children's tendencies to downplay their distress and family relationships are further hypothesized to increase callousness, and, ultimately, adjustment problems (Davies, Sturge-

Apple, Cicchetti, & Cummings, 2007). Therefore, given that EST further describes the psychological processes proposed in the attenuation hypothesis, we also draw on this theoretical framework to guide our hypotheses.

Disruptions in children's emotional processing in the wake of family instability are proposed to be manifested in the key dimensions of callousness including impairments in social perspective taking, empathy, emotional arousal, and social connectedness. Callousness, in turn, is proposed to magnify children's vulnerability to school problems by undermining their socio-emotional readiness for educational settings. For example, children higher in callousness are likely to have difficulties cooperating with others, engaging in academic activities, complying with classroom rules, and forming social bonds with peers and teachers (Frick & White, 2008). Therefore, we specifically examine whether callousness mediates associations between family instability and children's adjustment to school. Consistent with prevailing multi-dimensional conceptualizations of school readiness and functioning, children's success in academic settings is proposed to hinge on their ability to regulate their behavior (e.g., refrain from aggression and behavioral problems), engage and participate in learning activities, and sociably interact and cooperate with their peers (Denham, 2006; Ladd, Birch, & Buhs, 1999). Therefore, we utilized a broad index of school adjustment characterized by children's functioning across three critical domains: (a) academic functioning (i.e., school engagement), (b) behavioral conduct (i.e., conduct, aggressive, and oppositional problems), and (c) social functioning (i.e., prosocial behavior).

Although no studies have directly examined whether callousness mediates the risk posed by family instability, there is some indirect, piecemeal empirical support in the literature for the psychological processes proposed by the attenuation hypothesis and emotional security theory. In addressing the first link in the mediational chain, a handful of studies have identified some selective family predictors of callousness. For example, parental harshness, low warmth, and maltreatment have been concurrently and prospectively related to children's callousness in early childhood (Waller et al., 2012), middle childhood (Barker, Oliver, Viding, Salekin, & Maughan, 2011), and adolescence (Carlson, Oshri, & Kwon, 2015; Kimonis, Cross, Howard, & Donoghue, 2013). In fact, Carlson and colleagues (2015) found that callous-unemotional behaviors mediated associations between retrospective reports of child maltreatment and concurrent risky behaviors in late adolescence. Likewise, studies have also identified associations between callousness and children's school adjustment difficulties in early (Graziano et al., 2016) and middle childhood (Ciucci, Baroncelli, Franchi, Golmaryami, & Frick, 2014; Vaughn et al., 2011). For example, Graziano and colleagues (2016) found that preschool children higher in callousness evidenced poorer school readiness across academic, behavioral, and social domains of adjustment. However, the predominant use of cross-sectional designs in examining links between callousness and school adjustment problems do not authoritatively test our mediational hypotheses.

Negative Internal Representations of the Family as a Mediator of Family Instability

In highlighting the potential operation of another process, other conceptualizations have also posited that children's insecurity in the family may account for associations between family instability and children's maladjustment (Ackerman et al., 1999; Simpson et al., 2012).

Attachment and emotional security theories share the assumption that children's insecurity during the preschool and early school years are reflected in their internal representations of family relationships (Davies, Winter, & Cicchetti, 2006; Johnston, Roseby, & Kuehnle, 2009). Internal representations of the family are defined as scripts children develop regarding their beliefs or expectations about the nature and quality of family relationships, particularly in stressful circumstances. According to emotional security theory (EST; Davies et al., 2006; also see Johnston et al., 2009), stable and predictable family environments foster children's internal representations of the family as a source of security and support, even in the context of threat. By contrast, the fragility and chaos evident in highly unstable homes is posited to engender threatening representations of family relationships characterized by hostility, apathy, and indifference (Ackerman et al., 1999; Simpson et al., 2012). Moreover, equipped with gains in social perspective taking, use of symbolism, and emotion understanding in the preschool years, young children are in the process of actively forming expectancies about the consistency of care and protection from threat in their families (Bachman et al., 2011; Sroufe, 2000). Therefore, relationship disruptions in the home are proposed to be particularly salient sources of children's negative representations of family relationships during the transition to formal schooling (Oppenheim, 2006).

Negative representations of the family, in turn, are further conceptualized as increasing children's risk for psychological difficulties, particularly within new and challenging settings. In drawing on script models (Johnston et al., 2009; Oppenheim, 2006), EST specifically proposes that children use negative representations of family relationships as a guide to simplifying, interpreting, and quickly responding to unfamiliar, complex, and challenging interpersonal contexts (Davies et al., 2006). From this perspective, negative representations are posited to be manifested in the prioritization of processing and defending against interpersonal threat at the expense of approach-oriented systems that support exploration and affiliation goals (Davies & Martin, 2013). Therefore, breakdowns in these systems that follow from heightened concerns about insecurity would be exhibited in decreased motivation to engage in academic activities (i.e., exploration) and diminished prosocial behavior and cooperation with peers (i.e., affiliation problems). By virtue of the relative novelty of the school setting, multiple and changing tasks, and stressful activities (e.g., coping with peer conflict, following classroom rules), the maladjustment sequelae of internal representations are proposed to be magnified in the context of children's transition to formal schooling. Accordingly, we test the hypothesis that children's negative internal representations of family relationships mediate longitudinal associations between family instability and children's school adjustment problems as they progress into the early elementary school years.

Research provides some preliminary, indirect support for the mediational role of negative internal representations in contexts of family adversity. In addressing the viability of the first link in the mediational chain, investigations have documented associations between other indices of relationship discord (e.g., interparental conflict, child maltreatment) and negative internal representations of the family unit during early childhood (Grych, Wachsmuth-Schlafer, & Klockow, 2002; Sturge-Apple, Davies, Winter, Cummings, & Schermerhorn, 2008; Toth, Cicchetti, Macfie, & Emde, 1997). In supporting the second link in the proposed model, empirical work has also identified children's negative internal representations of family relationships (e.g., parent-child, interparental) as correlates or predictors of psychological problems during early childhood (Cummings, Schermerhorn, Keller, & Davies, 2008; Vu, 2015), including school adjustment difficulties (Sturge-Apple et al., 2008). Finally, in the only study to directly examine children's representations of the family as a mediator of family instability, Forman and Davies (2003) showed that insecure family appraisals accounted for concurrent links between family instability and psychological problems during adolescence.

Present Study

In summary, empirical testing of child processes that account for the risk posed by family instability is limited to a single cross-sectional, mono-method study that exclusively targeted adolescent negative representations of the family (Forman & Davies, 2003). In contrast, mediation consists of the successive unfolding of processes over time. Moreover, quantitative psychologists have strongly recommended against the use of cross-sectional designs to test mediational hypotheses based on firm documentation that they generate biased and misleading findings (Cole & Maxwell, 2003; Maxwell & Cole, 2007). Therefore, our study represents the first test of multiple child characteristics (i.e., callousness, negative internal representations of the family) as putative mechanisms in the pathway between family instability and children's school adjustment problems. To overcome the previous limitations of the cross-sectional study, we utilized a longitudinal, repeated measures design spanning three years to afford an analysis of change at each link in the mediational chain. Likewise, the multi-method (i.e., surveys, observations) and multi-informant (i.e., observer, parent, and teacher) assessment battery in the present study was designed to reduce the operation of common method and informant variance. Finally, to reduce the potential operation of confounding factors in the mediational tests, we included demographic characteristics (i.e., parental education, total household income per capita, child race, child gender) and child verbal IQ as covariates in the analyses. Additionally, given empirical documentation of interparental conflict as predictor of children's internal representations (e.g., Grych et al., 2002; Sturge-Apple et al., 2008) and adjustment problems (e.g., Cummings & Davies, 2010), we included destructive interparental conflict as a covariate to control for its possible role as a third variable.

Methods

Participants

Participants included 243 families (mother, intimate partner, and preschool child) residing in a moderate-sized metropolitan area in the Northeastern United States. Data were collected between 2010 and 2014 as part of a larger project designed to explore the impact of interparental conflict and family relationships on children. To obtain a sample from diverse demographic backgrounds, participants were recruited through local preschools, Head Start agencies, Women, Infants, and Children (WIC) programs, an advertisement posting on the internet site *Craigslist*, and public and private daycares serving children and families from a variety of demographic backgrounds. Interested families were screened by research staff to ensure they met the following criteria for inclusion in the study: (1) adult primary caregiver must have currently had an intimate partner who had regular contact with the caregiver and child over the past year prior to Wave 1; (2) both adult caregivers and the child were willing to participate; (3) at least one of the adults was the biological parent of the target child; (4) the child participant was four or five years old at the first wave of data collection; (5) the child was not in an adoptive, foster, or kinship care arrangement; (6) the child did not have any significant cognitive, sensory, or motor difficulties that may compromise the validity of assessments; and (6) the family was fluent in English.

Of the 560 families who contacted research staff for more information, 317 were either ruled ineligible or decided they were no longer interested in participating. Of these 317 families: 24.3% did not have a salient intimate partner, 16.4% were no longer interested after hearing more information, 30.6% had children that were either the wrong age or already in kindergarten, 8.2% provided invalid contact information, 6.3% did not schedule a visit before study enrollment had concluded, 1.0% had a child with a developmental or mental delay, 1.0% had insufficient English skills, 1.3% did not have a child living in the home, and 11.0% were ruled ineligible for other reasons (e.g., not biological parents, partner in military, partner only around child for six months). The remaining 243 families who were interested and eligible were included as the sample that participated in the study.

The longitudinal design consisted of three annual measurement occasions, with retention rates across contiguous waves of data collection of 97% and 94%. Comparisons of families lost to attrition and those who participated in all three waves along the 19 variables included in the primary analyses (i.e., family instability, child callousness and negative representations at Waves 1 and 2, school adjustment at Waves 1 and 3, covariates) and additional demographic characteristics (i.e., child age, ethnicity) only yielded one significant difference. Families participating in all waves evidenced significantly lower total household income per capita (in thousands: $M = 9.26$, $SD = 5.82$) than those who dropped from the study (in thousands: $M = 12.94$, $SD = 8.83$), $t(237) = 2.68$, $p < .01$. The average age of child participants was 4.60 years ($SD = .44$) at Wave 1, 5.75 years ($SD = .47$) at Wave 2, and 6.81 years ($SD = .48$) at Wave 3. The sample was racially diverse, as almost half of the families were Black or African American (48%), followed by smaller percentages of families who identified as White (43%), multi-racial (6%), or another race (3%). Approximately 16% of family members were Latino. The high minority representation was consistent with that of

other urban areas and with demographic statistics for families living in poverty (DeNavas-Walt & Proctor, 2015). Girls comprised around half (56%) of the sample. Median household income of families was \$36,000 per year (range = \$2,000 – \$121,000), with most families (69%) receiving public assistance. Median education for parents consisted of a GED or high school diploma. At Wave 1, parents had lived together an average of 3.36 years and had, on average, daily contact with each other and the child (range = daily to 2 or 3 days a week). Ninety-nine percent of mothers and 74% of their partners were the biological parents of the target child, and 47% of the adults were married.

Procedures and Measures

Parents and children visited our research center laboratory for three waves of data collection, each wave spaced 1 year apart. Parents and their children were separated during the collection of measures used in the present study. Data were collected by doctoral students and research staff who all had at least a bachelor's degree and previously participated in extensive training to learn and apply measures to a diverse sample of children and families. All research procedures were approved by the Institutional Review Board prior to conducting the study. Families and teachers were compensated monetarily for their participation.

Family instability—At Wave 1, mothers completed the Family Instability Questionnaire (FIQ; Ackerman et al., 1999; Forman & Davies, 2003) to assess family instability. The five items (e.g., “In the past year, how many times have you become involved in a serious romantic relationship [regular date, live-in partner, fiancée, spouse]?”) designed to assess the total number of unstable events in family relationships experienced by the family in the last year included changes in caregivers, transitions in romantic relationships of the primary caregiver (i.e., start of new relationships, break-ups, moving in with a partner), and death of a close family member. The measure, which consists of the total number of unstable family events, has good psychometric properties for samples of families with developmental (e.g., young children), racial, and SES backgrounds that are comparable to our sample (e.g., Ackerman et al., 1999).

Children's callous interpersonal orientations—A measure of children's callous interpersonal orientations was derived from maternal report at Waves 1 and 2 on the Callousness scale of the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004). Although the ICU includes multiple subscales, we focused on inclusion of the Callousness scale because it most closely corresponded to the construct proposed in the relevant theoretical frameworks (i.e., attenuation hypothesis and emotional security theory). The Callousness scale consists of 11 items designed to capture the extent to which the child seems cold and uncaring, does not care about getting in trouble, and hurts others' feelings (e.g., “the feelings of others are unimportant to him/her”) using a four-point Likert scale ranging from 0 (*not at all true*) to 4 (*definitely true*). Scores were calculated by summing responses to the items, and internal consistencies for the scale were .62 at Wave 1 and .65 at Wave 2. Prior research supports the validity and reliability of this measure for young children from diverse demographic (e.g., racial minority and low SES samples) backgrounds (e.g., Ezpeleta, de la Osa, Granero, Penelo, & Domenech, 2013; Waller et al., 2015).

Children's negative internal representations of family relationships—At Waves 1 and 2, children completed a revised version of the MacArthur Story Stem Battery (MSSB-R; Cummings et al., 2008). The MSSB-R consists of a series of story stems indexing conflicts and adversity in each of three family relationship subsystems: (a) mother-father (i.e., two stories: angry parental conflicts over losing keys and getting home later than expected), (b) mother-child (i.e., two stories: reunion following extensive separation, child injury after violating maternal instructions), and (c) father-child (i.e., two stories: reunion following extensive separation, child injury after violating paternal instructions). In depicting the story stems, experimenters used animated voices, various toy props, and action figures depicting family members. After each story stem, children completed the stories with the action figures, props, and when, necessary, probes to maximize the richness of the narrative responses. Two trained coders (one doctoral graduate student and one baccalaureate-level research staff member) who were not involved in the collection of MSSB-R data rated the video records of the MSSB-R task along two dimensions of family relationship quality: antagonism and apathy (MSSB-R; Cummings et al., 2008). Coders were trained by the principal investigator of the project who has substantial expertise in coding the MSSB-R. Coders completed training until acceptable interrater agreement was established.

Coders assessed each of the six stories along two scales ranging from 1 (*negligible*) to 7 (*high*). As the first code, the Antagonistic Relationship Quality Scale captured children's portrayals of hostility, anger, and antipathy in family relationships. Narratives rated lower on Antagonism may contain one or a few brief instances of antagonism in the target relationship, but these tended to be brief in duration and low in intensity or quality (e.g., mild expressions of anger such as raised voices that are focused on the challenging circumstance, rather than insults or name-calling). In contrast, narratives rated higher on Antagonism portrayed the relationship quality of the dyad as highly hostile, angry, and combative. Specific examples included physical aggression directed at another person (e.g., hitting, kicking, pushing, throwing objects at another person), death, profound physical injury that was intentionally inflicted by another person, or actions that are likely to result in significant emotional injury (e.g., divorce, insults, and name-calling). As the second code, the Apathetic Relationship Quality scale assessed the degree of indifference, unresponsiveness, and detachment in children's portrayals of the interparental or parent-child relationship. Mild expressions of apathy in the narratives contained one or a few instances of indifference or detachment in the target relationship that are largely portrayed in indirect, ambiguous, or subtle ways by the child. For instance, one or both of the main characters may be left out of the story, or when they are included together, there is no depiction of how they interact with each other (e.g., sitting at the table without talking). At higher levels, apathy is reflected in narratives that directly portray the relationship quality of the dyad as predominantly indifferent, cold, somber, or neglectful (e.g., family member storms out of the house and does not return).

At each of the two waves, composites of antagonistic and apathetic representations of family relationships were created by averaging ratings of antagonism ($\alpha = .62$ for Wave 1 and $\alpha = .74$ for Wave 2) and apathy ($\alpha = .71$ for Wave 1 and $\alpha = .71$ for Wave 2) across the six

stories. The two composites, in turn, were specified as manifest indicators of a latent composite of negative family representations. Intraclass correlation coefficients, based on overlap between two trained raters on 20% of the videos, ranged from .82 to .96 for the two composites across Waves 1 and 2. Research with samples of children representative of a variety of different demographic backgrounds (e.g., races, ethnicity, SES levels) supports the reliability and validity of MSSB assessments (e.g., Cummings et al., 2008; Toth et al., 1997).

Children's school adjustment—Teacher reports on three scales from the MacArthur Health and Behavior Questionnaire (HBQ; Ablow et al., 1999) were used as indicators of a latent construct of children's school adjustment at Waves 1 and 3. In the 9% of cases where the child was not enrolled in a preschool program at Wave 1, data were obtained from an adult outside of the immediate family (e.g., babysitter, family friend, neighbor) who saw the child on a regular (i.e., daily) basis and knew the child very well. First, as an assessment of children's ability to function socially with other children, the Prosocial Behavior scale is comprised of the sum of the 20 items reflecting the extent to which children display behaviors that help others, share, invite bystanders to play, and are considerate of others (e.g., "will try to help someone who has been hurt"). Second, as an assessment of children's academic functioning, the School Engagement scale is comprised of the eight items designed to assess children's interest and enjoyment of school (e.g., "is interested in classroom activities"). Reports of school engagement at Wave 1 for children not enrolled in a preschool program were excluded from analyses. Third, as an assessment of children's ability to regulate their behavioral conduct, the Externalizing scale assesses children's defiance, conduct problems, and aggression and includes the 10 items from Overt Hostility (four items; e.g., "kicks, bites, or hits other children") and Relational Aggression (six items; e.g., "tries to get others to dislike a peer") subscales. Internal consistencies for the three scales across the two waves ranged from .84 to .95. Prior research supports the reliability and validity of the HBQ for participants in early childhood with a variety of demographic (e.g., low SES and racial minority groups) backgrounds (see Ablow et al., 1999).

Covariates—Four demographic covariates, derived from a maternal interview at Wave 1, included (a) children's gender (1 = girls; 2 = boys), (b) parental education level, calculated by averaging mother and partner education level on a scale from 1 (none to 7th grade) to 7 (graduate degree), (c) total household income per capita, calculated by dividing the total annual income of the family unit by the number of individuals living in the home, and (d) child race (0 = non-White; 1 = White). As the fifth covariate, we assessed destructive interparental conflict based on maternal reports at Wave 1 on the Psychological Aggression and Physical Assault scales from the Conflict Tactics Scale (CTS-2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). For this measure, mothers reported on the various verbal and physical tactics used to resolve or terminate interparental conflicts. Following scoring guidelines, prevalence scores were calculated based on the sum of whether or not each partner used the tactic in the past year (0 = specific act did not occur, 1 = act occurred one or more times). Whereas the Psychological Aggression scale is designed to assess verbal and psychological forms of interparental hostility during conflict (e.g., "I insulted or swore at my partner"; $\alpha = .88$), the Physical Assault scale assesses interparental violence during conflicts (e.g., "I pushed or shoved my partner"; $\alpha = .93$). The two scales were standardized and

aggregated together to form a single composite of interparental conflict ($\alpha = .78$). As the sixth and final covariate, we assessed children's verbal IQ using the Information and Word Reasoning subtests of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Wechsler, 2002) at Wave 2. We used the Verbal IQ composite score derived from the two subtests in our primary analyses.

Results

Descriptive Analyses

For descriptive purposes, Table 1 provides the raw means, standard deviations, sample range (i.e., minimum and maximum values obtained on each measure), and intercorrelations among the focal variables in the primary analyses. The measure of family instability evidenced non-normality (i.e., high skew and kurtosis). A square root transformation was conducted to normalize its distribution. The transformed variable was utilized in the primary analyses.

Analytic Plan for Primary Analyses

Our hypothesized model was tested using autoregressive structural equation modeling (SEM), specified with Amos 22.0 statistical software (Arbuckle, 2013). The use of latent constructs in SEM provides a multidimensional and powerful assessment of the underlying constructs and reduces measurement error. In these analyses, latent constructs included children's negative internal representations of family relationships at Waves 1 and 2 and school adjustment at Waves 1 and 3. Full-information maximum likelihood (FIML) was used to estimate missing data (10.63% of all values; 27.37% of values in teacher-reported data) and retain the full sample for primary analyses (Enders, 2001). Prior to conducting our primary analyses, we first examined the fit of the measurement model reflecting the patterns of relations among manifest and proposed latent variables. Therefore, a measurement model was constructed for the latent variables that included the manifest variables (e.g., family instability, callousness, covariates), Wave 1 and 2 latent internal representations and Wave 1 and 3 latent school adjustment, their intercorrelations, and each of their respective manifest indicators. Model fit was assessed using (1) the root-mean-square error of approximation (RMSEA), with values of .08 or less indicating acceptable fit (Browne & Cudeck, 1993), (2) the χ^2/df ratio, with values between 1 and 3 reflecting acceptable fit (Arbuckle, 2013), and (3) the comparative fit index (CFI), with values greater than .90 reflecting acceptable fit (Bentler, 1990).

The measurement model provided a good representation of the data, $\chi^2(83, N = 243) = 111.27, p < .05$; $RMSEA = .04$; $CFI = .97$; χ^2/df ratio = 1.34. To maximize measurement equivalence of the latent constructs of negative representations from Wave 1 to Wave 2 and school adjustment from Wave 1 to Wave 3, factor loadings of the indicators of each latent construct were constrained to be equal across the time points. Criteria for establishing measurement invariance after adding these constraints requires that at least two of the three following conditions are satisfied: (a) the chi-square difference is non-significant, (b) decrease in CFI is no more than .01, and/or (c) increase in RMSEA is no more than .01 (Dimitrov, 2010). After adding the constraints, the difference in fit from the unconstrained

measurement model was as follows: $\chi^2 = 8.75$, $df = 3$, $p < .05$; $CFI = .99$; $RMSEA = .002$. Because the model still fit the data well after including these constraints, $\chi^2 (86, N = 243) = 120.02$, $p < .01$; $RMSEA = .04$; $CFI = .97$; χ^2/df ratio = 1.40, and the decrease in CFI and increase in RMSEA were both well below the .01 cutoff, we used the more conservative approach of utilizing the constrained measurement model in the primary analyses. Factor loadings for all manifest indicators of the latent constructs were significant ($p < .001$), in the expected direction, and moderate to strong in magnitude (range = absolute value of .55 to .88).

For the primary analysis plan, we adopted a conservative approach of estimating all prospective structural paths among the predictors and covariates, proposed mediators, and the school adjustment outcome. Thus, the primary analysis of children's callous interpersonal orientations and negative internal representations of the family as mediators of their vulnerability to family instability specifically consisted of the estimation of family instability and the six covariates (i.e., parental education, total household income per capita, child race, child verbal IQ, child gender, and destructive interparental conflict) as predictors of callousness and negative family representations at Wave 2 and school adjustment problems at Wave 3 (see Figure 1). Additional structural paths were estimated between Wave 2 callousness and negative internal representations and Wave 3 school adjustment to test the second link in the mediational chain. Autoregressive paths at Wave 1 were also included for callousness, negative internal representations, and school adjustment to control for stability in the proposed mediators and outcome. As an additional covariate, we also estimated structural paths between Wave 1 school adjustment and Wave 2 callousness and negative internal representations. All covariances among exogenous predictors and residual errors on Wave 2 mediators (i.e., Wave 2 callousness and negative representations) were also estimated. However, for the sake of clarity, these covariances are not presented in Figure 1 (see Table 2 for covariances). Finally, as follow-up analyses, we tested whether hypothesized mediational paths in the primary analysis were statistically significant.

Results of Primary Analyses

The results of the primary structural model shown in Figure 1 and Table 2 provided a good fit with the data: $\chi^2 (88, N = 243) = 126.21$, $p < .01$; $RMSEA = .04$; $CFI = .96$; χ^2/df ratio = 1.43. Autoregressive paths were significant for children's callousness, $\beta = .49$, $p < .001$, negative internal representations of the family, $\beta = .50$, $p < .001$, and school adjustment, $\beta = .37$, $p < .001$. Consistent with prior empirical work, children's decreases in school adjustment from Waves 1 to 3 were predicted by higher levels of family instability, $\beta = -.17$, $p < .05$, at Wave 1. As hypothesized, family instability was associated with subsequent increases from Waves 1 to 2 in children's callous behaviors, $\beta = .12$, $p < .05$, and their negative internal representations of family relationships, $\beta = .20$, $p < .05$. In turn, children's callous behaviors at Wave 2 predicted school adjustment problems at Wave 3 after controlling for school difficulties at Wave 1, $\beta = -.19$, $p < .05$. Likewise, children's negative internal representations of the family predicted poorer school adjustment at Wave 3 after controlling for adjustment at Wave 1, $\beta = -.19$, $p < .05$. As a whole, the model accounted for 32.1% of the variance in Wave 2 negative internal representations ($R^2 = .32$), 33.5% of the variance in Wave 2 callousness ($R^2 = .34$), and 42.7% of the variance in Wave 3 school

adjustment ($R^2 = .43$). As further evidence of mediation, bootstrapping tests in the PRODCLIN software program indicated that the indirect paths involving family instability and school adjustment were significantly different from zero for: (1) child callousness, 95% CI $[-1.38, -.01]$ and (2) child negative internal representations, 95% CI $[-2.20, -.04]$ (MacKinnon, Fritz, Williams, & Lockwood, 2007).

To evaluate the generalizability of the pathways in our model, we conducted an additional set of analyses to examine whether structural paths in Figure 1 varied as a function of child gender or race. Therefore, to test the moderating role of each of these two characteristics, we conducted multiple group comparisons in which the data were split according to the dichotomous structure of each of the proposed moderators (i.e., boys and girls for the gender variable; White and non-White for the race variable). Separate multi-group analyses were conducted for each moderator. Because splitting the data resulted in small sample sizes per group, it was necessary to conduct multiple group path analysis using manifest, rather than latent, composites for our measures of children's internal representations and school adjustment. To form these primary constructs, manifest variables were created by first standardizing the respective manifest indicators of each latent construct and subsequently summing them to create composites. We then conducted multiple group comparisons for the primary structural paths in Figure 1 by comparing a model in which all parameters were allowed to vary freely with a model in which the following paths were constrained to equality across the relevant groups (i.e., boys and girls; White and non-White children): (1) the predictive paths from Wave 1 family instability to Wave 2 callousness, Wave 2 negative internal representations, and Wave 3 school adjustment, (2) the predictive path from Wave 2 callousness to Wave 3 school adjustment, and (3) the predictive path from Wave 2 negative internal representations to Wave 3 school adjustment. Comparisons of the constrained and free-to vary models revealed no difference in fit for either of the group comparisons, thereby indicating that primary paths in Figure 1 did not differ as a function of child gender or race.

Discussion

Although family instability has repeatedly been linked with children's negative adjustment (e.g., Ackerman et al., 1999; Bachman et al., 2011), very few studies have identified the mediating mechanisms that account for why family instability poses a risk for the development of children's psychological problems (e.g., Donahue et al., 2010; Forman & Davies, 2003). Guided by theory, this multi-method, multi-informant, longitudinal study sought to test the viability of children's callousness and negative internal representations of family relationships as mediators of associations between their exposure to instability in family relationships and their school adjustment problems during early childhood. Findings indicated that family instability predicted increases in both children's callousness and negative internal representations of family relationships over time, which, in turn, predicted worse school adjustment over a 2-year period.

Results of the mediational tests indicated that children's callousness uniquely mediated the association between family instability and school adjustment problems. A handful of previous studies had found empirical support for some selective family predictors of callousness (e.g., parental harshness, low warmth, maltreatment; Barker et al., 2011;

Kimonis et al., 2013; Waller et al., 2012). However, to our knowledge, the only study that examined callousness as a mediator of family stress focused specifically on retrospective reports of maltreatment and adolescent functioning (Carlson et al., 2015). In further highlighting the gap, previous empirical work with young children has largely focused on cross-sectional associations between callousness and school adjustment (e.g., Ciucci et al., 2014; Graziano et al., 2016; Vaughn et al., 2011). In building on these studies, our findings provide the first empirical test of callousness as a key mediating mechanism accounting for longitudinal associations between family instability and children's adjustment problems in early childhood.

These results are consistent with the cascade of processes proposed in the attenuation hypothesis (Susman, 2006). As a theoretical model, the attenuation hypothesis highlights both the physiological and psychological processes that may give rise to the operation of callousness as a mediator. At the physiological level, emotional dampening following exposure to unstable family events may be the result of one of two possible neurobiological processes. First, unpredictability and chaos accompanying family instability may disrupt the ability of the limbic system to decipher the emotional meaning and significance of interpersonal relationships, thereby engendering the development of callous traits (Susman, 2006). Thus, the ability of children from unstable homes to process and respond to emotional interpersonal events may become progressively impaired over time. Second, the attenuation hypothesis also raises the possibility that the dampening of responses to emotion may actually be a protective response to the initial over-arousal of physiological systems in response to high levels of family instability and chaos. In the first step of the proposed process, sensitization of physiological systems (e.g., hypothalamic-pituitary-adrenal [HPA] axis) in response to experiencing instability may have highly toxic effects (e.g., high cortisol) for the brain. In the second step of the putative sequence, the resulting physiological hypersensitivity may trigger down-regulation of biological responsiveness to environmental input to buffer against the noxious effects (Susman, 2006). Although the attenuation of biological responses to emotional stimuli may serve a protective function, the tradeoff is greater risk for the development of callousness and, in turn, heightened vulnerability to behavior problems and social difficulties (Del Giudice, Ellis, & Shirtcliff, 2011; Frick & White, 2008; Susman, 2006).

In further building on the psychobiological conceptualization of callousness in the attenuation hypothesis, EST provides an elaboration on the psychological sources of attenuation (e.g., Davies & Martin, 2013). EST specifically posits that some children may suppress vulnerable affective responses to family adversity (e.g., fear, distress) and the personal significance of family relationships in order to attain a sense of emotional security. Decreases in the arousal of stress-responsive physiological systems may be a key part of this process (e.g., HPA axis, limbic system; Davies et al., 2007). However, tendencies to downplay family relationships and the experience of distress are hypothesized to increase emotional detachment, callousness, and ultimately adjustment problems (Davies et al., 2007). Thus, children's callousness may be a natural psychological consequence of the adverse impact of family instability and a key carrier of risk for children's adjustment problems.

Our findings also indicated that children's negative internal representations of family relationships mediated associations between family instability and school adjustment problems. Although Forman and Davies (2003) had previously found that insecure appraisals of the family mediated concurrent associations between family instability and psychological problems during adolescence, our longitudinal results extend these findings to early childhood and more definitively test the unfolding cascade of processes that are proposed in mediational models (e.g., Cole & Maxwell, 2003). These results are consistent with the notion that the fragile, chaotic, and unpredictable features of an unstable family system may increase children's vulnerability to adjustment difficulties by amplifying their representations of the family unit as threatening (e.g., Ackerman et al., 1999). Therefore, children's exposure to unstable family relationships may signify to them that the family is unable to establish and maintain predictability and safety for their well-being (Davies & Martin, 2013). Consistent with constructs of children's internal representations in script theory (Johnston et al., 2009), EST posits that children's ability to preserve their goal of security is manifested in their internal representations of family experiences. Thus, family instability may undermine children's confidence in their ability to maintain their security and well-being, resulting in representations of the family as a source of insecurity characterized as uncaring, unsupportive, volatile, and threatening (Ackerman et al., 1999; Simpson et al., 2012). These findings build on previous work documenting the same types of associations between other indices of family relationship discord (e.g., interparental conflict, child maltreatment) and children's negative internal representations in early childhood (e.g., Grych et al., 2002; Sturge-Apple et al., 2008; Toth et al., 1997).

Children tend to rely more heavily on prior family representations as a way to simplify and comprehend challenging and novel interpersonal contexts (Johnston et al., 2009). Therefore, unstable, unpredictable, and potentially volatile family relationships may give rise to negative internal representations of family relationship processes that limit the generation of effective coping under threatening contexts (Baldwin, 1992). Children possessing negative internal representations of family relationships are proposed to scan their environments for old dangers and defend against them in similar ways (Johnston et al., 2009). Further, reliance on old defensive ways of processing novel interpersonal events in the school setting may increase children's prioritization of personal safety goals at the cost of investing in the mastery of the physical and social environment (Davies et al., 2006). Thus, over time, these limited coping responses are thought to broaden and deepen into school adjustment problems (Crick & Dodge, 1994), which is consistent with findings from the present study and prior empirical work (e.g., Sturge-Apple et al., 2008).

Interestingly, both the development of children's callousness and negative internal representations of family relationships emerged as independent mediating processes. The negligible to weak correlations between callousness and negative internal representations at both waves (see Tables 1 and 2) indicate that children who are high in callousness do not necessarily exhibit more negative internal representations. Therefore, consistent with the concept of equifinality in developmental psychopathology (Cicchetti & Rogosch, 1996), our results suggest that there may be multiple distinct pathways through which family instability confers risk for children's school problems. Identifying the distinctive family experiences (e.g., emotional climate) and child attributes (e.g., child temperament) that may be sources

of these different pathways will be an important direction for future research (Belsky & Pluess, 2009; Cavanagh & Huston, 2006).

Our findings must also be interpreted in the context of study limitations. First, although the families in our study were relatively diverse in racial and socioeconomic backgrounds, caution should be exercised in generalizing our findings to other samples (e.g., adolescents; Spanish-speaking Latinos). Modest effect sizes in the mediational pathways underscore the heterogeneity in the experiences of children exposed to similar levels of instability. Therefore, it will be important for future work to examine other family factors (e.g., parent psychopathology, parenting practices) that may alter the predictive pathways. Second, our eligibility requirement that the adult primary caregiver must have currently had an intimate partner who had regular contact with both the caregiver and child over the course of the year prior to Wave 1 may have somewhat constrained the amount of instability in our sample, particularly on items related to romantic relationship transitions experienced by the primary caregiver. Although a substantial minority of our sample did report at least one instance of becoming involved in a serious romantic relationship (35% of mothers), moving in with a serious romantic partner (30% of mothers), or breaking up or separating from a romantic partner (19% of mothers) over the course of the previous year, further empirical work will be necessary to explore whether our findings generalize to families experiencing even more significant levels of instability. Third, it is also possible that our assessment of family instability may not capture key dimensions of instability for subgroups in our sample (e.g., Latinos) where instability in important family relationships may also include the moving in and out of extended family members other than primary caregivers and their romantic partners. Similarly, due to power concerns, our comparison of the strength of the mediational pathways across White and non-White children is a relatively unrefined analysis of generalizability. Examining whether the findings hold within more specific non-White subgroups is an important direction for future research. However, it is also important to note that the findings in our study remained robust even after the inclusion of several demographic variables as covariates.

In addition to limitations related to the generalizability of findings, it is also important to consider other study limitations. First, our theoretically guided examination of children's callousness and negative internal representations as mediators is not exhaustive. Even after considering these pathways and the covariates in the model, it is important to note that family instability still emerged as a significant predictor of children's school problems two years later. Thus, future research would benefit from expanding the scope of factors that may serve as mediators (e.g., parenting, physiological processes; Del Giudice et al., 2011; Forman & Davies, 2003; Susman, 2006). Second, although our selection of indicators of child school adjustment was also guided by theory (Davies & Martin, 2013; Ladd et al., 1997), there are other important aspects of academic success that will be important for future work to examine (e.g., academic achievement and grades, quality of peer relationships). Third, as is common in family instability research (e.g., Ackerman et al., 1999; Bachman et al., 2011), our multi-method, multi-informant design does not rule out the operation of common method and informant variance because mothers reported on both family instability and callousness. However, the potential for method variance to artificially inflate relationships between family instability and callousness is reduced by the longitudinal,

autoregressive design. Fourth, our study does not account for the possible influence of gene-environment correlations on our results. For instance, it is possible that a genetic-based vulnerability shared by both parents and children is manifested in more unstable relationship experiences by parents and greater callousness by children. Fifth, although the attenuation hypothesis provides characterizations of both children's physiological and psychological responses in the face of family instability, the focus of our study was to examine the psychological manifestation (i.e., callousness) of underlying physiological processes. It will be critical for future work to explicitly explore the physiological processes described in the attenuation hypothesis to account for associations between family adversity and children's maladjustment (e.g., limbic system functioning, HPA axis functioning).

In summary, our multi-method, multi-informant, longitudinal study was designed to provide one of the first empirical tests of the mediating roles of two theoretically guided child mechanisms (i.e., callousness and negative internal representations of family relationships) accounting for associations between children's exposure to instability in family relationships and their school adjustment problems during early childhood. Findings indicated that children's callousness and negative internal representations of family relationships each served as distinct mediators in the prospective pathway between their exposure to unstable family relationships and their increases in school problems over time. These results build on previous research identifying early childhood as a sensitive period for the influence of family instability on children's adjustment difficulties (Cavanagh & Huston, 2008; Simpson et al., 2012). Furthermore, the findings highlight the utility of testing process models of family instability and assessing mechanisms characteristic of the child when accounting for why family instability may contribute to children's difficulties with stage-salient tasks (e.g., adjusting to formal schooling).

Although replication and extension of our findings is necessary before we can offer definitive clinical recommendations, the results may have important translational implications for preventing children's adjustment difficulties. The results specifically suggest preventative programs designed to increase the stability and harmony of intimate adult relationships may reduce a multitude of child difficulties including callousness, negative internal representations of family relationships, and school adjustment difficulties (e.g., Halford, Markman, & Stanley, 2008). However, it may not always be feasible to implement these programs given that they require the cooperation and commitment of both partners in a relationship. Even in highly unstable homes, resources (e.g., extended family support) are commonly available to children. As a result, targeting the promotion of children's appraisals of positive aspects of family life may provide them with a more balanced comprehension of the strengths as well as the challenges experienced in their families (e.g., Pedro-Carroll, 2008).

However, it is important to also consider the translational ramifications of the assumption that negative internal representations are relatively accurate depictions of family life that serve adaptive purposes of helping children to identify and cope with interpersonal adversity (Bretherton, 1985). In highlighting our documented associations between family adversity and negative family representations, any treatment program must guard against magnifying children's positive representations of family relationships to unrealistic and inaccurate

levels. If internal representations accurately reflect the vicissitudes of family life, then another point of intervention may involve stopping children's tendency to draw on their negative family scripts as a way of interpreting and responding in novel or challenging interpersonal contexts (e.g., school). Thus, any intervention designed to promote some positive appraisals of family relationships may benefit by a balanced emphasis on limiting children's tendencies to draw on their more negative representations of family life as road maps for navigating these new environments (Davies et al., 2006; Johnston et al., 2009). Moreover, given the distinctive role of callousness as a mediator of family instability, programs designed to increase children's empathy and social perspective taking may offer an additive way to counteract the risks associated with growing up in unstable homes (e.g., Bierman et al., 2004; Kam, Greenberg, & Walls, 2003).

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Table 1

Means, Standard Deviations, Sample Ranges, and Intercorrelations of the Main Variables

	Mean	SD	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Wave 1																						
1. Child Gender	--	--	--	--	--																	
2. Parent Education	4.62	1.14	2.00	7.00	.03	--																
3. Income (thousands)	9.60	6.22	.80	32.00	.06	.63*	--															
4. Child Race	--	--	--	--	.01	.51*	.48*	--														
5. Destructive IPC	.00	1.81	-2.24	6.90	-.06	-.12	-.14*	-.12	--													
6. Family Instability	2.12	2.90	.00	24.00	.07	-.27*	-.22*	-.29*	.20*	--												
7. Callousness	.41	.28	.00	1.64	.12	.05	-.07	-.00	.18*	.12	--											
8. Antagonism Reps	2.39	1.23	1.00	7.00	.05	-.27*	-.25*	-.23*	.10	.16*	.06	--										
9. Apathy Reps	3.62	1.02	1.00	6.60	.12	-.36*	-.26*	-.31*	-.01	.13	.05	.47*	--									
10. Prosocial Behavior	25.61	9.45	1.00	40.00	-.15*	.08	.08	-.02	-.12	-.12	-.38*	-.05	-.03	--								
11. School Engagement	14.44	2.39	2.00	16.00	-.02	.09	.06	-.05	-.02	-.21*	-.18*	-.07	-.05	.57*	--							
12. Externalizing	2.74	3.78	.00	19.00	-.02	-.09	-.11	-.10	-.05	.16*	.29*	.08	.07	-.46*	-.34*	--						
Wave 2																						
13. Verbal IQ	98.92	15.96	57.00	137.00	-.15*	.44*	.43*	.45*	-.04	-.22*	-.08	-.19*	-.34*	.26*	.15	-.28*	--					
14. Callousness	.38	.29	.00	1.64	.17*	.00	-.05	.01	.07	.19*	.54*	-.09	.04	-.26*	-.15	.18*	-.11	--				
15. Antagonism Reps	2.29	1.13	1.00	7.00	.12	-.12	-.09	-.20*	.15*	.22*	.02	.34*	.25*	-.02	.01	-.01	-.15*	.11	--			
16. Apathy Reps	3.12	1.02	1.00	6.57	.10	-.19*	-.15*	-.17*	.05	.20*	.03	.18*	.24*	-.01	-.03	.01	-.13	.06	.57*	--		
Wave 3																						
17. Prosocial Behavior	25.63	10.22	.00	40.00	-.09	.26*	.18*	.17*	-.03	-.26*	-.17*	-.23*	-.11	.37*	.28*	-.26*	.27*	-.30*	-.21*	-.25*	--	
18. School Engagement	13.13	3.23	1.00	16.00	.00	.36*	.32*	.29*	-.05	-.24*	-.08	-.20*	-.17*	.31*	.37*	-.11	.29*	-.24*	-.14	-.18*	.66*	--
19. Externalizing	2.47	3.82	.00	19.00	-.11	-.26*	-.27*	-.22*	.07	.31*	.12	.18*	.06	-.32*	-.27*	.36*	-.29*	.24*	.19*	.12	-.57*	-.44*

Note. IPC = Interparental Conflict; Reps = Representations. Child gender: 1 = girls, 2 = boys; child race: 0 = non-White, 1 = White.

* $p < .05$.

Table 2
Modeled Covariances between Variables in Structural Equation Models used for Primary Analyses

	1	2	3	4	5	6	7	8	9	10	11
Covariates											
1. Child Gender	--										
2. Parent Education	.03	--									
3. Family Income	.06	.63***	--								
4. Child Race	.01	.51***	.48***	--							
5. Destructive IPC	-.06	-.12	-.13*	-.12	--						
6. Verbal IQ	-.17*	.43***	.43***	.46***	-.04	--					
7. W1 Callousness	.12	.05	-.07	-.00	.18**	-.08	--				
8. W1 Negative Reps	.13	-.45***	-.35***	-.39***	.06	-.36***	.08	--			
9. W1 School Adjustment	-.16*	.11	.11	-.01	-.09	.28***	-.42***	-.17	--		
Predictor											
10. Family Instability	.07	-.29***	-.23***	-.31***	.21**	-.26***	.12	.21*	-.16	--	
Mediators											
11. W2 Callousness	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	--
12. W2 Negative Reps	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	<i>n.e.</i>	.16

Note. Parameter estimates for the covariances are standardized correlation coefficients. IPC = Interparental Conflict; Reps = Representations; W1 = Wave 1; W2 = Wave 2; *n.e.* = covariance not estimated because predictive path was estimated. Child gender: 1 = girls, 2 = boys; child race: 0 = non-White, 1 = White.

* $p < .05$.

** $p < .01$.

*** $p < .001$.