AMERICAN PSYCHOLOGICAL ASSOCIATION

Developmental Psychology


ISSN: 0012-1649

2021, Vol. 57, No. 12, 2179–2191
https://doi.org/10.1037/dev0001271

# The Associations of Maternal Warmth and Hostility With Prosocial and Antisocial Outcomes in Justice-Involved Adolescents

Erin P. Vaughan[1], Paul J. Frick[1], James V. Ray[2], Emily L. Robertson[1], Laura C. Thornton[3], Tina D. Wall Myers[4], Laurence Steinberg[5, 6], and Elizabeth Cauffman[7]

[1] Department of Psychology, Louisiana State University
[2] Department of Criminal Justice, University of Central Florida
[3] Louisiana Department of Health, New Orleans, Louisiana, United States
[4] New Orleans, Louisiana, United States
[5] Department of Psychology, Temple University
[6] Center for Social and Humanities Research, King Abdulaziz University
[7] Department of Psychological Science, University of California, Irvine

Parental warmth and hostility are two key dimensions of parenting for child development, but the differential effects of these parenting dimensions on child prosocial and antisocial development has not been adequately investigated. The current study hypothesized that parental warmth would be uniquely related to child callous–unemotional traits and prosocial behavior, whereas parental hostility would be uniquely related to child delinquency and aggression. These hypotheses were investigated in a diverse sample of 1,216 adolescent males (13 to 17 years old, 46% Latino, 37% Black) with justice-system involvement in the 5 years following their first arrest. Hybrid models estimated within- and between-individual associations over time, while controlling for the overlap between parental warmth and hostility and between child prosocial and antisocial outcomes. Results indicated that maternal warmth showed consistent associations with callous–unemotional traits and prosocial behavior over time, whereas maternal hostility showed consistent associations with delinquency and aggression over time. Further, the findings were similar across racial and ethnic groups. Implications for developmental models of antisocial behavior, particularly for those including the role of callous–unemotional traits, are discussed.

*Keywords:* maternal warmth, maternal hostility, callous–unemotional traits, prosocial behavior, antisocial behavior

*Supplemental materials:* https://doi.org/10.1037/dev0001271.supp



Parenting is critical to most major theories of how children and adolescents develop a propensity for showing antisocial and aggressive behaviors (Frick & Viding, 2009), and changing parents' practices has been a crucial component of the most effective interventions for preventing and treating aggression and delinquency in youth (McMahon & Frick, 2019). Much of this research has focused on the detrimental effects of parents' use of hostile (e.g., yelling, use of harsh punishment) and inconsistent parenting (e.g., inconsistent enforcement of rules and application of punishment), and this research has strongly supported the contention that such parenting can lead to behavior problems in a child (Pinquart, 2017). There have been a number of theories proposing possible mechanisms through which hostile parenting can lead a child to develop conduct problems. For example, in the classic social learning theory of antisocial behavior proposed by Patterson (1982), hostile parenting leads to a coercive cycle between the parent and child in which the parent may get reinforced for using hostile parenting strategies (e.g., corporal punishment, yelling) because it leads to temporary compliance by the child. However, the child eventually reacts to such socializing attempts by acting in a similar manner (e.g., hitting parents, throwing a temper tantrum), which leads the parent to back down on demands. These negative interactions eventually result in the child learning to use negative control strategies not only in the family but also in school and with peers.

Another dimension of parenting that has long been considered important for child development is *parental warmth*, typically defined as affection, kindness, closeness, and positive communication between parent and child (Waller et al., 2018). Importantly, factor analyses have found that parental warmth does not seem to

Erin P. Vaughan https://orcid.org/0000-0002-3316-2941
Emily L. Robertson https://orcid.org/0000-0001-7643-8242
Laura C. Thornton https://orcid.org/0000-0001-5209-9098
Tina D. Wall Myers https://orcid.org/0000-0003-0354-7258
Tina D. Wall Myers is now at the Louisiana Department of Health, New Orleans, Louisiana, United States.

This work was supported by the John D. and Catherine T. MacArthur Foundation, the Office of Juvenile Justice and Delinquency Prevention (Grant 2005-JK-FX-K001), the County of Orange, and the William T. Grant Foundation. The authors declare no conflicts of interest.

Correspondence concerning this article should be addressed to Erin P. Vaughan, Department of Psychology, Louisiana State University, 236 Audubon Hall, Baton Rouge, LA 70803, United States. Email: evaugh7@lsu.edu

simply be the opposite pole of hostile parenting, but instead seems to form a distinct dimension of parenting (Zlomke et al., 2014). Further, whereas parental warmth has been associated with conduct problems and delinquency in some research (Pinquart, 2017), this dimension of parenting has been more often studied in developmental research in relation to prosocial outcomes, including a child's prosocial emotions (e.g., empathy and guilt) and the prosocial behaviors (e.g., helping others) that are motivated by these emotions (Eisenberg et al., 2015). Similar to the distinction between warm and hostile parenting, prosocial emotions and behavior are a related but distinct construct from a lack of antisocial behavior, with unique correlates and etiologies (Krueger et al., 2001). Warm and affectionate parenting practices have been linked with prosocial outcomes in several studies; for example, Putnick and colleagues (2018) reported that in a cross-national study of 1,178 families from nine countries, higher parental acceptance of the child predicted increases in child prosocial behavior from age 9 to 10 years and from age 10 to 12 years, and this finding was consistent across the countries and cultures studied. A number of theories have been developed to explain the mechanisms involved in how parental warmth can influence the child's development of prosocial emotions and behaviors. For example, Kochanska (1997b) proposed that children develop prosocial emotions and behaviors through a warm parent–child relationship, in which they learn how to recognize emotions in others and are motivated to be responsive to the feelings of others through this warm and mutually cooperative relationship between the parent and child.

Thus, existing research suggests that these two dimensions of parenting might be differentially associated with specific aspects of child development, with parental hostility being more strongly related to problems in the child's development of self-control (or ability to inhibit antisocial behavior including aggression) and parental warmth being more strongly associated with the child's development of prosocial emotions and behavior (Kochanska, 1997b; Kochanska & Murray, 2000). This possible specificity in the influence of these dimensions of parenting could have important implications for theories of how antisocial behavior develops.

## Callous–Unemotional Traits and Developmental Pathways to Antisocial Behavior

Empathy, guilt, and other prosocial emotions have been conceptualized in developmental research as motivating prosocial behavior, such as sympathetic and helping behaviors (Eisenberg et al., 2015). In addition to motivating prosocial behaviors, however, these prosocial emotions also have been theorized as being important for helping a child inhibit antisocial behavior that harms or violates the rights of others (Frick & Kemp, 2021; Meehan et al., 2019). Research has made clear, though, that not all children who develop serious conduct problems show deficiencies in prosocial emotions. In fact, recent research on the development of serious conduct problems has focused on two distinct causal pathways differentiated by the presence or absence of significant levels of *callous–unemotional* (CU) traits, defined largely by deficits in prosocial emotions (i.e., lack of remorse or guilt, callousness or lack of empathy, unconcern about performance in important activities, shallow or constricted affect; Frick et al., 2014b). Importantly, CU traits have been empirically negatively linked to measures of empathy (Cardinale & Marsh, 2020), and research on CU traits has been integrated with developmental research on prosocial emotions (Frick & Kemp, 2021).

Critically for causal theories of serious conduct problems, children with conduct problems who also show elevated CU traits (i.e., deficient prosocial emotions) exhibit different genetic, cognitive, emotional, and personality characteristics compared to children with conduct problems who show normative levels of CU traits, including a stronger hereditary influence to their behavior problems, attributions supporting the use of aggression to obtain goals, reduced emotional responsiveness to distress in others, and less neuroticism and fearfulness (Frick et al., 2014b). Further, this group is clinically important, given that antisocial youth who show elevated levels of CU traits are likely to show a particularly severe, stable, and aggressive pattern of behavior (Frick et al., 2014b), and they tend to leave traditional mental health treatments with more severe behavior problems than other antisocial youth (Hawes et al., 2014; Wilkinson et al., 2016). As a result of this research, CU traits have recently been included as a specifier for mental health diagnoses for children and adolescents with severe behavior problems in the major classification systems used worldwide (American Psychiatric Association, 2013; World Health Organization, 2019).

The use of CU traits to define distinct subgroups of youth with serious behavior problems has encouraged an integration of research and theory on the development of antisocial behavior with research and theory on normal development of prosocial emotions and behaviors (Frick et al., 2014a; Frick & Viding, 2009). Such an integration could be advanced by disentangling the different components of parenting and their associations with problem behaviors and CU traits in the child. Several studies have supported that conduct problems and CU traits are associated with unique parenting practices; for example, the hostile parenting practices that have been traditionally linked to conduct problems are less strongly associated with antisocial outcomes when CU traits are present (Sng et al., 2018; Wootton et al., 1997). Instead, as would be expected from research on prosocial development, the antisocial outcomes of those with elevated CU traits appears to be connected to variations in parental warmth. In support of this possibility, a study of 95 boys (4 to 12 years old) found that observational measures of parental hostility were more strongly associated with conduct problems in those low on CU traits, whereas observed parental warmth was more strongly associated with conduct problems in those high on CU traits (Pasalich et al., 2011). Other studies have replicated this finding on the importance of parental warmth for explaining the conduct problems of children with elevated CU traits in both cross-sectional (Waller et al., 2014) and longitudinal (Waller et al., 2015) studies. A few studies have also reported that various forms of positive parenting have been associated with CU traits themselves (Hyde et al., 2016; Muratori et al., 2016; Waller et al., 2013), including two studies reporting that CU traits were negatively related to parental warmth in children 2 through 6 years of age (Clark & Frick, 2018; Waller et al., 2014).

## Unique Outcomes of Harsh and Warm Parenting in Childhood

Thus, many studies have reported associations between harsh parenting and antisocial behavior, while others have reported

associations between warm parenting and CU traits. However, few studies have tested potential differential associations in the same sample, nor have they accounted for the overlap between predictors and outcomes. Because parental warmth and hostility are negatively related, and CU traits and antisocial behavior are positively related, lack of consideration of their overlap could result in spurious associations. For example, a link between harsh parenting and CU traits could be due to the overlap between CU traits and antisocial behavior or the overlap between harsh and warm parenting. Therefore, including some way of controlling for the shared variance in the dimensions of parenting and in the behavioral outcomes is necessary to determine how harsh and warm parenting uniquely relate to antisocial behavior and CU traits, but this has not consistently been done in existing research.

In one notable exception, Waller and colleagues (2018) reported that in a sample of 227 monozygotic twin pairs (ages 6 to 11 years), parental harshness was related to both aggression and CU traits, whereas CU traits were only associated with parental warmth after controlling for the overlap in the two dimensions of parenting and in the two child outcomes. Unfortunately, this study was cross-sectional and, as a result, the longitudinal associations of parenting with later CU traits and aggression could not be tested. In another sample of 1,078 families using a longitudinal design, harsh-intrusive parenting and sensitive parenting assessed four times during the first three years of life were related to both conduct problems and empathy in the child in first grade; however, when accounting for both aspects of parenting simultaneously, only sensitive parenting remained significantly associated with both child outcomes (Mills-Koonce et al., 2016). Yet, these findings were difficult to interpret because, in addition to controlling for the other parenting variable, a number of other variables were controlled for as well (e.g., caregiver education, income, family disorganization, family instability). Finally, in a sample of 753 students, parental harsh punishment assessed in Grades 1 and 2 was related to conduct problems but not CU traits in Grade 6, whereas parental warmth in Grades 1 and 2 was related to CU traits but not conduct problems in Grade 6 (Goulter et al., 2020). This study provides initial but compelling evidence to support that harsh parenting is more strongly related to conduct problems, whereas warm parenting is more strongly related to CU traits.

## Parenting Influences in Adolescence

The research to date separating the influences of harsh and warm parenting on antisocial and prosocial outcomes has largely been limited to children in early to middle childhood. It would be important to investigate how these parenting dimensions may influence child outcomes later in development for a number of reasons. First, adolescence is the period when most individuals develop serious patterns of antisocial behavior (Frick & Viding, 2009). Second, the parent–child relationship undergoes significant changes in adolescence. During this time, relationships with parents are viewed as less supportive and more conflictual, and same-sex peers increase in developmental importance (Furman & Buhrmester, 1992). Third, despite these changes in the parent–child relationship, parenting remains an important influence on antisocial behavior during this developmental period (Hair et al., 2008). In fact, a meta-analysis of over 1,400 studies including over one million children and adolescents reported that the association between parenting and measures of aggressive, defiant, and disruptive behaviors grew stronger with age through adolescence (Pinquart, 2017). Therefore, it is critical to study the association of parenting with delinquent and aggressive behaviors in adolescence.

It is also critical to test the association of parenting with prosocial emotions and behavior during adolescence. Specifically, there tends to be a normative decrease in a child's display of prosocial emotions and behaviors in adolescence (Eisenberg et al., 2015). However, the parent–child relationship remains important in predicting prosocial behavior and emotions through adolescence and into adulthood (Stern & Cassidy, 2018), which is further supported by studies specifically investigating CU traits in adolescence (Waller et al., 2013). No study to date, however, has specifically tested the differential influences of parental warmth and hostility on child CU traits and prosocial behavior in an adolescent sample.

## Parenting Differences Across Racial and Ethnic Groups

Another limitation in the existing research on the associations among warm and hostile parenting with delinquency, aggression, prosocial emotions, and prosocial behavior is the failure to consider potential differences across racial and ethnic groups. The possibility that there may be culturally-specific effects of parenting more globally on child development was proposed early by Baumrind (1972), who suggested that authoritarian parenting styles (i.e., rule-oriented with clear status hierarchies) may be more common and more adaptive in Black families than in White families. Consistent with this possibility, Pinquart and Kauser (2018) conducted a meta-analytic study and reported that authoritarian parenting was positively associated with conduct problems in White and Latino families from Western countries ($r = .10$, $p < .01$ and $r = .12$, $p < .001$, respectively) but not in Black families ($r = .05$). However, parental warmth and hostility have shown similar associations with conduct problems and delinquency across White, Black, and Latino families in several other studies (Pezzella et al., 2016; Querido et al., 2002; Steinberg et al., 1991; Yildirim & Roopnarine, 2015).

Lansford and colleagues (2018) provided an explanation for the inconsistency in the findings regarding potential cultural differences in the associations between parenting and child adjustment. In a study of 1,298 families with children (10 to 12 years of age) from 12 cultural groups across nine countries, they reported that there was more consistent evidence for within-cultural differences than between-cultural differences in the association between parenting behaviors and child adjustment, consistent with much of the past research in this area. However, when between-cultural differences were observed, they were typically of the form in which the association between parenting behavior and child adjustment was magnified (but not changed) in cultural contexts where the parenting behavior was more normative. For example, they reported that there was a consistent association between maternal warmth and child prosocial behavior across cultures. However, this association was magnified in cultures where greater maternal warmth is normative. Based on this finding, one would expect culturally specific effects of parenting to occur when certain parenting practices are more normative in different groups. It is important to note, however, that differences in the normative level of parental warmth and hostility have not been consistently found across racial and ethnic groups within the United States. For example, Yildirim and Roopnarine (2015) reported that in a study of 402 White, 978

Black, and 543 Latino families of 5-year-old children from 20 large cities in the United States, there were no mean differences in levels of observed maternal warmth or hostility across the three racial and ethnic groups. Therefore, the impact of parental warmth and hostility on child adjustment would not be expected to vary across these groups. However, this question has not been thoroughly investigated with regard to the distinct outcomes of parental warmth and hostility, and studies that have compared warm and harsh parenting in predicting CU traits, prosocial behavior, delinquency, and aggression have not tested for potential differences across racial and ethnic groups (Goulter et al., 2020; Mills-Koonce et al., 2016; Waller et al., 2018). Whereas previous studies have supported that the associations of parenting with CU traits and antisocial behavior are similar across samples of various cultural backgrounds from different countries (Sng et al., 2018, 2020), no study to date has investigated whether parenting is differentially related to antisocial and prosocial outcomes across racial and ethnic groups within the United States.

## Present Study

Based on this past research, the current study tested whether harsh and warm parenting showed differential associations with delinquency, aggression, CU traits, and prosocial behavior. We hypothesized that harsh parenting would be more predictive of the antisocial outcomes, whereas parental warmth would be more predictive of the prosocial outcomes. Further, we hypothesized that these differential associations would be consistent across White, Black, and Latino individuals.

In testing these hypotheses, we included a number of methodological advances that allowed us to make stronger conclusions than could be made from past results. First, we included two outcomes related to antisocial development (i.e., delinquency and aggression) and two outcomes related to prosocial development (i.e., CU traits and prosocial behavior). This methodology allowed us to determine if our hypotheses were consistent across these related constructs. Second, we tested these predictions in a large and ethnically diverse sample of adolescents with juvenile justice system involvement, resulting in a sample with greater variability in the level of delinquent and aggressive behavior than would have been present in a community sample, as well as allowing for investigation of differences across racial and ethnic groups. Third, we tested these hypotheses using a longitudinal design with both parenting and child outcomes assessed at multiple time points across adolescence and into young adulthood, providing a strong test of whether the two dimensions of parenting predicted these child outcomes over time. Fourth, this repeated measure design allowed us to use both time-varying predictors (i.e., parental warmth and hostility) and time-varying outcomes (i.e., CU traits, prosocial behavior, delinquency, and aggression) and partition the effects of parenting on child outcomes into both between-individual (i.e., variations across participants) and within-individual effects (i.e., variations over time within participants). Including both within- and between-individual associations across time provides a strong developmental test of hypothesized associations, because the within-individual associations over time control for between-individual associations that can result from a host of unmeasured confounding variables (Allison, 2009; Schunck & Perales, 2017). Fifth, we tested this prediction in a way that controlled for the overlap between parenting dimensions and the overlap between child outcomes to test the unique effects of each parenting dimension on each child outcome. Accounting for the overlap in predictors and outcomes allowed us to detect distinctive associations between the specific aspects of each parenting dimension and child outcome.

# Method

## Participants

The sample utilized in this study was originally collected as a part of the Crossroads Study, which drew participants from the justice systems of Orange County, California; Jefferson Parish, Louisiana; and Philadelphia, Pennsylvania in order to investigate outcomes of juvenile justice involvement. Individuals were eligible for participation if they spoke English and were first-time male offenders between the ages of 13 and 17 ($M_{age}$ = 15.29) charged with a mild to moderate offense. Most qualifying offenses were property offenses (i.e., vandalism, theft, robbery; 48.4%), followed by drug offenses (i.e., possession of a controlled substance, possession of marijuana, possession with intent to distribute; 22.5%) and person offenses (i.e., assault, battery; 19.7%). Of those eligible, 72.3% enrolled in the study, leading to a baseline sample of 1,216 individuals. This sample was racially and ethnically diverse, with most of the sample identifying as Latino ($n$ = 557, 45.8%) or Black ($n$ = 449, 36.9%), and the remainder identifying as White ($n$ = 180, 14.8%) or other ($n$ = 30, 2.4%). Most of the sample had at least one parent who had completed high school (34.6%) or above (38.5%), but approximately 26.9% of the sample did not have a parent who had completed high school. After enrolling between July of 2011 and May of 2013 when they were between the ages of 13 and 17, youths participated in nine survey waves across 5 years, resulting in a sample ranging from ages 18 to 23 at the ninth wave. Participation rates across waves were high; of the 1,216 youth included at baseline, 96% completed the 6-month interview, 94% the 12-month interview, 94% the 18-month interview, 93% the 24-month interview, 92% the 30-month interview, 91% the 36-month interview, 87% the 48-month interview, and 84% the 60-month interview. This sample has been used in several previous studies investigating associations between parenting, CU traits, and antisocial behavior (Ray et al., 2017, 2019; Simmons et al., 2018, 2019; Thomas et al., 2018), but no previous studies using this sample have investigated the differential correlates of parental warmth and hostility.

## Procedure

The Crossroads study was approved by institutional review boards at University of California, Irvine (#2010–7867), Temple University (#13566), University of New Orleans (#02DEC10), and Louisiana State University (#3650). Eligible individuals were approached about study involvement, and informed consent and assent were obtained from a parent or guardian and the youth; after the youth reached the age of 18, the participant provided informed consent. Adolescents and parents were informed that participation was voluntary and would have no influence on their involvement with the justice system. Based on the sensitive nature of the sample and the data, a privacy certificate was obtained from the

Department of Justice to prevent the use of the information in legal proceedings. Participants were interviewed within 6 weeks of their arrest, then every 6 months for 3 years. After Year 3, interviews were repeated yearly until Year 5. Interviews were conducted by trained research assistants in the participant's home or another convenient public place (coffee shop, library, etc.) using laptops equipped with all interview procedures to ensure standardized administration. All questions were read aloud to participants to control for reading ability. Participants were compensated for each time point, beginning at $50 for the baseline interview and increasing by $15 for each subsequent interview up to $140, which was provided at the 36-, 48-, and 60-month interviews.

## Measures

### *Time-Stable Covariates*

Demographic characteristics were collected from youth self-report at baseline interview, including age, racial or ethnic identity, and highest level of education completed by parents, which was used as an estimate for socioeconomic status. IQ was assessed at baseline using the Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999), a well-established brief measure of intelligence for adolescents.

### *Time-Varying Predictors: Maternal Warmth and Hostility*

Maternal warmth and hostility were measured using the Quality of Parental Relationships Inventory (Conger et al., 1994), a 42-item measure that was previously adapted for use in an adolescent offender sample to assess the affective tones of the individual's relationship with their parents from the youth's perspective (Williams & Steinberg, 2011). Due to missing data on the father questionnaire (ranging from 25% at baseline to 39% at the 60-month interview), only the 21 questions regarding the youth's mother or primary female caregiver were included in the current study. The proportion of participants who indicated currently living with their family of origin (rather than on their own, with friends, in a secure facility, etc.) ranged from 85% at baseline to 69% at the 60-month interview. Because not all participants lived with their mother or primary female caregiver, participants were required to endorse having had contact with them, either by phone or in person, since the previous interview in order to answer this questionnaire. Participants were asked to report on the frequency of warm and hostile behaviors during the time since the previous interview. Items on the Warmth scale (nine items) include "let you know she really cares about you" and "listen carefully to your point of view," whereas items on the Hostility scale (12 items) include "get angry at you" and "slap or hit you with her hands." All items were rated on a scale ranging from 1 (*always*) to 4 (*never*). The Warmth scale has been found to be consistently negatively related, and the Hostility scale positively related, to antisocial behavior in adolescent samples (Williams & Steinberg, 2011). In the current sample, the 5-year stability for maternal warmth was $r = .39$ ($p < .001$), and the year-to-year stability ranged from $r = .61$ to .70 (all $ps < .001$). For maternal hostility, the 5-year stability was $r = .31$ ($p < .001$), and the year-to-year stability ranged from $r = .55$ to .64 (all $ps < .001$). Internal consistency across waves ranged from acceptable to excellent for the Warmth and Hostility scales across time points ($\alpha$s = .90–.93 and $\alpha$s = .77–.84, respectively).

### *Time-Varying Outcomes*

**CU Traits.** CU traits were assessed using the self-report version of the Inventory of Callous–Unemotional Traits (ICU; Kimonis et al., 2008), a 24-item instrument that utilizes a 4-point Likert scale ranging from 0 (*not at all true*) to 3 (*definitely true*) for the individual to indicate how well each statement describes him. The scale contains equal numbers of items worded in the positive (meaning higher levels of CU traits; e.g., "I do not feel remorseful when I do something wrong") and negative (meaning lower levels of CU traits; e.g., "I am concerned about the feelings of others") direction. The negatively worded items are recoded so that higher scores indicate higher levels of CU traits or lower prosocial emotions. The total ICU score has been consistently associated with antisocial behavior (positively) and empathy (negatively) across a range of adolescent samples (Cardinale & Marsh, 2020). The 5-year stability was $r = .35$ ($p < .001$), and the year-to-year stability ranged from $r = .62$ to .68 (all $ps < .001$). Cronbach's alpha values were acceptable to good ($\alpha$s = .77–.80) across time points.

**Prosocial Behavior.** The Consideration of Others subscale of the Weinberger Adjustment Inventory (Weinberger & Schwartz, 1990) is a seven-item scale measuring the extent to which a person responds in ways that benefit others without personal gain. Items, such as "I often go out of my way to do things for other people" are rated on a 5-point Likert scale ranging from 1 (*false*) to 5 (*true*). This scale correlates with other prosocial outcomes, including empathic concern, perspective taking, and caring acts (Espelage et al., 2004). In the current sample, the 5-year stability was $r = .32$ ($p < .001$), year-to-year stability ranged from $r = .49$ to .56 (all $ps < .001$), and internal consistency coefficients were moderate to acceptable across time points ($\alpha$s = .69–.78).

**Delinquency.** Participants self-reported their involvement with 24 criminal activities using the Self-Reported Offending (Huizinga et al., 1991). For example, some types of criminal activity include damaging property, stealing, selling drugs, and carrying a gun. At baseline, participants were asked if they had ever engaged in these activities; at later time-points, they were asked if they had engaged in the activities since the last interview. Responses were summed for a total score which reflects greater criminal offending and has been correlated with official records of criminal offending in adolescent samples (Thornberry & Krohn, 2000). The 5-year stability was $r = .25$ ($p < .001$), and the year-to-year stability ranged from $r = .47$ to .61 (all $ps < .001$). Cronbach's alphas ranged from .75 to .83 across time points.

**Aggression.** The Physical Aggression subscale of the Peer Conflict Scale (PCS; Marsee et al., 2004) was used to measure aggression. This 20-item subscale includes items describing proactive ("I start fights to get what I want") and reactive ("When someone hurts me, I end up getting into a fight") physical aggression. Items are rated on a 4-point scale ranging from 0 (*not at all true*) to 3 (*definitely true*). Scores on the PCS have been associated with a laboratory measure of aggressive behavior in detained adolescent boys (Muñoz et al., 2008) and have been shown to be associated with self-reported delinquency in samples of adolescents (Marsee et al., 2014). The 5-year stability was $r = .40$ ($p < .001$), the year-to-year stability ranged from $r = .53$ to .68 (all $ps < .001$), and internal consistency was good to excellent across time points ($\alpha$s = .88–.97).

## Analytic Plan

All analyses were conducted using Stata 15 (StataCorp, 2017); syntax of study analyses are available in the online supplemental material. First, to examine the effect of changes in maternal warmth and maternal hostility on changes in CU traits, prosocial behavior, delinquency, and aggression over time, we used a hybrid model approach. The hybrid modeling approach estimates random and fixed effects components simultaneously (Allison, 2009). Thus, both within-individual and between-individual heterogeneity in the effect of predictors on each outcome is estimated (Allison, 2009; Schunck & Perales, 2017). This is done in a multilevel framework where repeated measurements of variables are nested within individuals. Thus, Level 1 variables are those measured within-individuals across time, and the Level 2 variable is the individual (i.e., unique participant ID variable). Time-varying covariates are broken down into person-specific means (i.e., cluster- or group-mean centered) and deviation scores (i.e., the person-specific mean subtracted from the observed score at each time-point; Hox, 2010), where the former represents the between-individual effects and the latter represents the within-individual effects. Thus, between-individual effects are interpreted as the outcome being dependent on mean values of Level 1 predictors, and within-individual effects reflect the regression of deviation scores of the outcome on deviation scores of the predictors. In the current study, we utilized the *xthybrid* module (Perales & Schunck, 2016) to estimate the models. The hybrid model accounts for stable, unmeasured characteristics of the individual and provides estimates for time-stable covariates that are not available when using fixed-effects models. This approach models random variation in the slope parameters for the time-varying covariates (Allison, 2005). The hybrid model estimates the within-cluster effects by including the deviation from the cluster-specific mean on a given variable and the between-cluster effects by including the cluster-specific mean for a given variable. Thus, the following equation represents the hybrid model:

$$g(u_{ij}) = \beta_w(x_{ij} - \overline{x}_i) + \beta_B\overline{x}_i + \gamma c_i + u_i,$$

where $g(u_{ij})$ represents the Gaussian link function that transforms the outcome so that it is linearly related to predictors; $\beta_w$ is the within-cluster effect, $\beta_B$ is the between-cluster effect, $\gamma c_i$ is the fixed effects for Level 2 only variables, and $u_i$ is the random intercept.

In the current study, a stepwise approach was taken, and two hybrid models were estimated for each outcome. In the first step, demographic characteristics and maternal warmth and hostility were included in the model. In the second step, the two child outcomes that are conceptually distinct from the outcome of interest were included in the model to control for overlap between outcomes. For example, when CU traits or prosocial behavior was the outcome, delinquency and aggression were included as predictors in the second step, in order to determine the effect on CU traits and prosocial behavior independent of delinquency and aggression. Next, in order to determine if the effects of maternal warmth and hostility varied across race and ethnicity, we repeated hybrid models for each racial and ethnic group (White, Black, and Latino) separately for each outcome. Due to the small number of participants identifying as another racial or ethnic group ($n$ = 30), these participants were excluded for these analyses. We then tested for differences in the strength of the unstandardized beta coefficients (Paternoster et al., 1998) across all three racial and ethnic groups. A significant difference in the coefficient would suggest that the effect varied in strength across groups. In order to handle missing data, each hybrid model was estimated with multiple imputation using the *mi impute* (iterative Markov chain Monte Carlo imputation) and *mi estimate* commands in Stata with 20 iterations. All variables used in the statistical models were included in the imputation process (see von Hippel, 2013). Analyses of the multivariate normality assumption of multiple imputation revealed that the data violated this assumption; however, Monte Carlo simulations with varying sample sizes have suggested that multiple imputation is robust to violations of normality in samples larger than 400 (Demirtas et al., 2008).

## Results

Table 1 provides descriptive statistics for study variables across time points, and a full correlation table of all study variables can be found in the online supplemental material (see Table S1). Results of the hybrid model analyses are presented in Table 2. Standardized coefficients are reported, which can be interpreted as effect sizes. The results were consistent when predicting either CU traits (Model 1) or prosocial behavior (Model 2). That is, after controlling for the time-stable covariates and age, both maternal warmth and maternal hostility showed significant within-individual and between-individual associations with CU traits and prosocial behavior. However, when delinquency and aggression were added to the model (i.e., Step 2), the associations with maternal warmth remained significant but the associations with maternal hostility did not, consistent with the study hypotheses. Thus, maternal warmth appears to be uniquely linked to both CU traits and prosocial behavior within individuals over time and across individuals.

Tests of the within-individual and between-individual predictors of delinquency (Model 3) and aggression (Model 4) also largely supported hypotheses. When predicting delinquency, maternal hostility was a significant within- and between-individual predictor both before and after controlling for CU traits and prosocial behavior (i.e., Step 2), but maternal warmth was not. Unexpectedly, when predicting aggression, although maternal warmth was not a predictor in Step 1 (without controlling for CU traits and prosocial behavior), maternal warmth was positively associated with aggression within- and between-individuals in Step 2 (when controlling for CU traits and prosocial behavior). However, maternal hostility remained a significant predictor of aggression both within-individuals and between-individuals in both Step 1 and 2. Therefore, maternal hostility was more consistently associated with variations in delinquency and aggression than maternal warmth, considering both variations within individuals over time and across individuals.

Table 3 presents the within-individual results of hybrid models specific to each racial and ethnic group predicting all four outcomes. Results were largely consistent for within- and between-individual effects; as such, only within-individual effects were tested for differences across racial and ethnic groups (full hybrid model results including the between-individual effects are reported in the online supplemental material; see Tables S2 through S5).

**Table 1**
*Univariate Descriptive Statistics for Time-Stable and Time-Varying Covariates Across Study Waves*

| Variable | Baseline *M*/frequency (*SD*/%) | 6-month *M* (*SD*) | 12-month *M* (*SD*) | 18-month *M* (*SD*) | 24-month *M* (*SD*) | 30-month *M* (*SD*) | 36-month *M* (*SD*) | 48-month *M* (*SD*) | 60-month *M* (*SD*) | Minimum/ maximum |
|---|---|---|---|---|---|---|---|---|---|---|
| Time-stable | | | | | | | | | | |
| IQ | 88.42 (11.60) | | | | | | | | | 55–128 |
| Site: California | 532 (43.75) | | | | | | | | | 0–1 |
| Site: Philadelphia | 533 (43.83) | | | | | | | | | 0–1 |
| Site: Louisiana | 151 (12.42) | | | | | | | | | 0–1 |
| Parental education | 5.33 (0.06) | | | | | | | | | 1–10 |
| Time-varying | | | | | | | | | | |
| Age | 15.29 (1.29) | 15.82 (1.33) | 16.32 (1.29) | 16.83 (1.32) | 17.31 (1.30) | 17.80 (1.33) | 18.29 (1.29) | 19.31 (1.29) | 20.29 (1.30) | 13–23 |
| Maternal warmth | 3.17 (0.66) | 3.13 (0.69) | 3.11 (0.72) | 3.13 (0.70) | 3.16 (0.69) | 3.17 (0.68) | 3.20 (0.67) | 3.28 (0.68) | 3.28 (0.67) | 1–4 |
| Maternal hostility | 1.59 (0.43) | 1.50 (0.37) | 1.48 (0.37) | 1.45 (0.39) | 1.43 (0.34) | 1.43 (0.34) | 1.41 (0.33) | 1.41 (0.33) | 1.41 (0.34) | 1–4 |
| CU traits | 26.28 (8.08) | 25.52 (8.24) | 25.17 (8.47) | 24.47 (8.44) | 24.13 (8.37) | 23.83 (8.48) | 23.14 (8.50) | 22.58 (8.65) | 21.68 (8.55) | 0–62 |
| Prosocial behavior | 3.62 (0.77) | 3.61 (0.77) | 3.67 (0.78) | 3.70 (0.76) | 3.73 (0.79) | 3.77 (0.80) | 3.81 (0.81) | 3.89 (0.76) | 3.95 (0.74) | 1–5 |
| Delinquency | 1.49 (2.11) | 1.36 (2.24) | 1.17 (2.20) | 0.98 (1.96) | 0.89 (1.91) | 0.86 (1.95) | 0.79 (1.83) | 0.88 (1.83) | 0.91 (1.70) | 0–7 |
| Aggression | 6.88 (7.38) | 5.96 (7.36) | 5.48 (6.82) | 4.92 (6.69) | 4.38 (6.13) | 4.21 (6.25) | 3.99 (6.12) | 3.72 (5.55) | 3.58 (5.32) | 0–57 |

*Note.* *M* = mean; *SD* = standard deviation; IQ = intelligence quotient; CU = callous–unemotional.

As evident from these results, maternal warmth but not maternal hostility showed within-individual associations with both CU traits and prosocial behavior, when controlling for delinquency and aggression, and this was consistent for all three racial and ethnic groups. Further, the strength of the within-individual associations did not differ significantly across the three racial and ethnic groups in the predictions of CU traits. However, the coefficient for maternal warmth when predicting prosocial behavior was significantly larger for White families than for Latino families ($z = 2.03$, $p = .022$).

In contrast, maternal hostility but not maternal warmth showed within-individual associations with delinquency across all three racial and ethnic groups, after controlling for CU traits and prosocial behavior. Importantly, when testing for differences in the within-individual coefficients for maternal hostility predicting delinquency across the racial and ethnic groups, the coefficients were significantly different between Latino compared to Black families ($z = 4.55$, $p < .001$) and White compared to Black families ($z = 2.94$, $p = .002$). These findings suggest that maternal hostility, although predictive of delinquency across the three racial and ethnic groups, showed weaker within-individual associations for Black families compared to both Latino and White families. Finally, comparisons of the within-individual coefficients for the prediction of aggression revealed no differences in the strength of associations with maternal warmth and hostility across racial and ethnic groups.

## Discussion

These results provide strong support for specificity in the associations between parental warmth and hostility and different child outcomes. Specifically, parental warmth was consistently related to CU traits (i.e., low prosocial emotions) and prosocial behavior. In contrast, maternal hostility was consistently related to delinquency and aggression. Importantly, maternal hostility was associated with the prosocial outcomes prior to controlling for the antisocial outcomes; however, this association was no longer significant after accounting for delinquency and aggression, suggesting that maternal hostility's association with CU traits and prosocial behavior was largely due to the shared variance among CU traits, prosocial behavior, delinquency, and aggression (Waller et al., 2018).

Interestingly, maternal warmth was not negatively related to delinquency or aggression either before or after controlling for CU traits and prosocial behavior. It is possible that this was due to controlling for the shared variance in maternal warmth and maternal hostility, which were significantly correlated at each time point ($r = –.25$ to $–.43$, $p < .001$). To test this explicitly, we conducted a post hoc test not controlling for maternal hostility, and warmth was negatively associated with delinquency but not aggression. Of note, a positive association between warmth and aggression emerged when controlling for CU traits and prosocial behavior, though this association was not found prior to controlling for these variables. Such a suppressor effect needs to be interpreted cautiously due to the relatively small size of the association and the fact that it was not predicted a priori by theory. However, it may suggest that the variance in the aggression measure that is left after controlling for the shared variance in CU traits and prosocial behavior may represent a more adaptive

**Table 2**
*Stepwise Hybrid Models Estimating the Effects of Changes in Maternal Warmth and Hostility on CU Traits, Prosocial Behavior, Delinquency, and Aggression*

| | Model 1: CU traits | | | | Model 2: Prosocial behavior | | | | Model 3: Delinquency | | | | Model 4: Aggression | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Step 1 | | Step 2 | | Step 1 | | Step 2 | | Step 1 | | Step 2 | | Step 1 | | Step 2 | |
| Covariate | β | *SE* | β | *SE* | β | *SE* | β | *SE* | β | *SE* | β | *SE* | β | *SE* | β | *SE* |
| **Time-stable** | | | | | | | | | | | | | | | | |
| IQ | −0.14*** | 0.01 | −0.11*** | 0.02 | 0.13*** | 0.04 | 0.11*** | 0.02 | −0.03 | 0.02 | 0.01 | 0.02 | −0.06** | 0.02 | 0.00 | 0.02 |
| PA site | −0.17*** | 0.04 | −0.13*** | 0.04 | 0.17*** | 0.05 | 0.15*** | 0.04 | 0.15*** | 0.04 | 0.20*** | 0.04 | −0.18*** | 0.04 | −0.11** | 0.04 |
| LA site | −0.09 | 0.06 | −0.03 | 0.02 | 0.17** | 0.06 | 0.14* | 0.06 | 0.01 | 0.05 | 0.04 | 0.05 | −0.17** | 0.06 | −0.13* | 0.05 |
| Parental education | −0.05* | 0.02 | −0.05** | 0.02 | 0.04* | 0.02 | 0.05* | 0.02 | 0.05** | 0.07 | 0.06*** | 0.02 | 0.00 | 0.02 | 0.02 | 0.02 |
| **Within-individual effects** | | | | | | | | | | | | | | | | |
| Age | −0.17*** | 0.01 | −0.12*** | 0.01 | 0.16*** | 0.01 | 0.14*** | 0.01 | −0.23*** | 0.01 | −0.20*** | 0.01 | −0.16*** | 0.01 | −0.11*** | 0.01 |
| Maternal warmth | −0.18*** | 0.01 | −0.18*** | 0.01 | 0.12*** | 0.01 | 0.12*** | 0.01 | −0.01 | 0.01 | 0.02 | 0.01 | −0.01 | 0.01 | 0.04** | 0.01 |
| Maternal hostility | 0.08*** | 0.01 | 0.18 | 0.01 | −0.02* | 0.01 | −0.01 | 0.01 | 0.24*** | 0.01 | 0.22*** | 0.01 | 0.02*** | 0.01 | 0.18*** | 0.01 |
| CU traits | | | | | | | | | | | 0.17*** | 0.01 | | | 0.24*** | 0.01 |
| Prosocial behavior | | | | | | | | | | | 0.00 | 0.01 | | | −0.03* | 0.01 |
| Delinquency | | | 0.08*** | 0.01 | | | −0.02 | 0.02 | | | | | | | | |
| Aggression | | | 0.21*** | 0.01 | | | −0.09*** | 0.01 | | | | | | | | |
| **Between-individual effects** | | | | | | | | | | | | | | | | |
| Age | −0.18*** | 0.03 | −0.15*** | 0.03 | 0.19*** | 0.03 | 0.18*** | 0.03 | 0.01 | 0.03 | 0.06* | 0.03 | −0.09** | 0.03 | −0.01 | 0.03 |
| Maternal warmth | −0.39*** | 0.03 | −0.38*** | 0.03 | 0.26*** | 0.03 | 0.25*** | 0.03 | −0.05 | 0.03 | 0.05 | 0.03 | 0.00 | 0.03 | 0.16*** | 0.03 |
| Maternal hostility | 0.17*** | 0.03 | −0.03 | 0.03 | −0.10** | 0.03 | 0.02 | 0.03 | 0.31*** | 0.03 | 0.27*** | 0.03 | 0.45*** | 0.03 | 0.38*** | 0.03 |
| CU traits | | | | | | | | | | | 0.24*** | 0.03 | | | 0.40*** | 0.03 |
| Prosocial behavior | | | | | | | | | | | −0.03 | 0.03 | | | −0.01 | 0.03 |
| Delinquency | | | 0.14*** | 0.03 | | | −0.10** | 0.04 | | | | | | | | |
| Aggression | | | 0.35*** | 0.03 | | | −0.19*** | 0.03 | | | | | | | | |

*Note.* PA = Pennsylvania; LA = Louisiana; CU = callous–unemotional. For site, California is the comparison group.
* $p < .05$. ** $p < .01$. *** $p < .001$.

**Table 3**
*Within-Individual Effects of Hybrid Models Predicting Child Outcomes for Each Racial–Ethnic Group*

| | Black ($n$ = 449) | | Latino ($n$ = 557) | | White ($n$ = 180) | |
|---|---|---|---|---|---|---|
| Covariate | β | *SE* | β | *SE* | β | *SE* |
| **CU traits** | | | | | | |
| Age | −0.07*** | 0.02 | −0.15*** | 0.01 | −0.16*** | 0.02 |
| Maternal warmth | −0.18*** | 0.02 | −0.16*** | 0.02 | −0.19*** | 0.03 |
| Maternal hostility | 0.02 | 0.02 | 0.00 | 0.02 | 0.01 | 0.03 |
| Delinquency | 0.06** | 0.02 | 0.08*** | 0.01 | 0.09** | 0.03 |
| Aggression | 0.22*** | 0.02 | 0.21*** | 0.02 | 0.17*** | 0.04 |
| **Prosocial behavior** | | | | | | |
| Age | 0.16*** | 0.02 | 0.13*** | 0.02 | 0.13*** | 0.03 |
| Maternal warmth | 0.11*** | 0.02 | 0.10*** | 0.02 | 0.17*** | 0.03 |
| Maternal hostility | −0.14 | 0.02 | 0.00 | 0.02 | 0.02 | 0.03 |
| Delinquency | 0.00 | 0.02 | −0.02 | 0.02 | −0.01 | 0.03 |
| Aggression | −0.09*** | 0.02 | −0.09*** | 0.02 | −0.12** | 0.03 |
| **Delinquency** | | | | | | |
| Age | −0.19*** | 0.02 | −0.21*** | 0.02 | −0.19*** | 0.03 |
| Maternal warmth | 0.00 | 0.02 | 0.02 | 0.02 | 0.00 | 0.04 |
| Maternal hostility | 0.17*** | 0.02 | 0.25*** | 0.02 | 0.27*** | 0.03 |
| CU traits | 0.14*** | 0.02 | 0.19*** | 0.02 | 0.20*** | 0.04 |
| Prosocial behavior | 0.00 | 0.02 | 0.00 | 0.02 | 0.01 | 0.04 |
| **Aggression** | | | | | | |
| Age | −0.12*** | 0.02 | −0.11*** | 0.02 | −0.09** | 0.03 |
| Maternal warmth | 0.03 | 0.02 | 0.04* | 0.02 | 0.06 | 0.03 |
| Maternal hostility | 0.36*** | 0.02 | 0.17*** | 0.02 | 0.20*** | 0.03 |
| CU traits | 0.28*** | 0.02 | 0.24*** | 0.02 | 0.18*** | 0.03 |
| Prosocial behavior | −0.02 | 0.02 | −0.02 | 0.02 | −0.05 | 0.03 |

*Note*. CU = callous–unemotional.
* $p < .05$. ** $p < .01$. *** $p < .001$.



construct (e.g., assertiveness), although such an interpretation should await replication in other samples.

Overall, these results largely support our theoretical predictions that the two dimensions of parenting are associated with adolescent development in somewhat different ways (Kochanska, 1997a; Kochanska & Murray, 2000). That is, a warm and responsive parent–child relationship appears to be most critical for predicting prosocial outcomes (i.e., CU traits and prosocial behavior), whereas harsh parenting appears to be most important for predicting antisocial outcomes (i.e., delinquency and aggression; Kochanska, 1997b; Kochanska & Murray, 2000). Importantly, whereas this specificity in parenting effects has been proposed and tested to some extent in young children, our findings suggest that these effects continue through adolescence, a period that has proven to be important for the development of severe antisocial behavior and delinquency (Frick & Viding, 2009; Hair et al., 2008; Pinquart, 2017). Further, our analyses tested within- and between-individual effects across an extended period and showed that parenting is not only related to the overall level of CU traits, prosocial behavior, delinquency, and aggression in adolescents but is also related to changes in these important constructs across adolescence and into young adulthood.

Our results have important implications for studies of conduct problems and antisocial behavior that have attempted to use CU traits as a specifier of a unique causal pathway to these outcomes. Studies that collapse across multiple parenting dimensions potentially can underestimate the importance of parental warmth for the development of CU traits (Clark & Frick, 2018; Waller et al., 2014). Although our study focused on the differences between maternal warmth and maternal hostility, other distinctions within the broader construct of parenting may also be important. For example, in a sample of 92 young children (average age of 6.2 years), parental use of positive reinforcement was negatively related to conduct problems in children with elevated CU traits but not to CU traits themselves, whereas parental warmth was related to the level of CU traits (Clark & Frick, 2018). As a result, further distinctions between various aspects of positive parenting behaviors (e.g., use of positive reinforcement as a behavior change strategy) and the emotional quality of the relationship (e.g., positive views of the child, positive parent–child communication) may be important for identifying how distinct parenting dimensions are associated with antisocial and prosocial outcomes.

In addition to these implications for developmental theory, our results also have implications for treatment. That is, most interventions for preventing or reducing antisocial and aggressive behavior, whether in young children or in adolescents, include some focus on reducing hostile and inconsistent parenting (McMahon & Frick, 2019). Our results clearly support such a focus. However, our results also support emerging strategies for enhancing interventions for children and adolescents with elevated CU traits by focusing on ways to enhance parental warmth (Wilkinson et al., 2016). For example, Kimonis and colleagues (2019) adapted a

standard intervention to improve parenting by adding systematic and explicit coaching to increase parental warmth and emotional responsiveness toward their children. In an open trial of 23 families of children (ages 3 to 6 years) who were referred to a mental health clinic for serious conduct problems and elevated CU traits, they reported posttreatment decreases in children's conduct problems and CU traits and increases in prosocial behavior, with medium to huge effect sizes ($d$ = .7–2.0) that were maintained at a three-month follow-up. Although these results need to be tested in a more rigorous randomized control trial to more conclusively determine if the changes in parenting led to the changes in child outcomes, current results are at least suggestive that a focus on increasing parental warmth could be important for enhancing outcomes for youths with elevated CU traits. Further, results suggest that such modifications of existing treatments should be tested in adolescents who show both antisocial behavior and elevated CU traits.

For the most part, our findings were substantially similar for White, Black, and Latino families, a finding in line with a number of other studies comparing the effects of these specific parenting dimensions across racial and ethnic groups (Pezzella et al., 2016; Querido et al., 2002). That is, maternal warmth but not maternal hostility showed time-varying associations with both CU traits and prosocial behavior, whereas maternal hostility was more strongly associated with delinquency and aggression across all three racial and ethnic groups. The only differences were that the within-individual effects between maternal warmth and prosocial behavior were somewhat stronger in White families and the effects between maternal hostility and delinquency were somewhat weaker in Black families. However, as in past studies, the differences were only ones of magnitude, not in significance or direction (Lansford et al., 2018). As such, these findings, along with studies that have found similar prosocial and antisocial correlates of parenting cross-culturally (Sng et al., 2018, 2020), support a pattern in which warm parenting is associated with prosocial development, while hostile parenting is associated with antisocial behavior, and this pattern does not differ greatly across families from different cultural backgrounds.

It is important to interpret these results in the context of several study limitations. First, our study relied on adolescent report for all measures. Although shared method variance could have inflated the absolute level of the correlations among our measures, it would not explain the differential associations between parenting practices and child outcomes that were the focus of the study. However, it would be important to replicate these findings using other methods of assessing both parenting and child outcomes. Second, we included multiple constructs related to antisocial behavior (i.e., delinquency and aggression) and prosocial emotions and behavior (i.e., CU traits and prosocial behavior) and demonstrated that our findings on the differential associations with maternal warmth and hostility generalized across these related, but not identical, constructs. That is, while both delinquency and aggression involve behaviors that violate the rights of others and are highly correlated across samples, they also have unique developmental patterns and can involve both shared and unique causal factors (Burt, 2012). Similarly, whereas prosocial emotions (i.e., CU traits) are linked with prosocial behaviors (Meehan et al., 2019), the emotions typically develop prior to and serve to motivate the development of prosocial behaviors (Malti et al., 2016; Roberts et al., 2014). It is also important to note that CU traits encompass multiple types of prosocial emotions (e.g., empathy and guilt). These various prosocial emotions are correlated with measures of aggression (Malti & Song, 2018), factor analyses consistently show that they load together on an overarching construct with other indicators of CU traits (see Ray & Frick, 2020 for a meta-analysis), and this overall construct of CU traits has proven to be very important for distinguishing an etiologically and clinically important subgroup of children and adolescents with behavior problems (Frick et al., 2014b). However, it is also important to note that measures of empathy and guilt are only modestly correlated and they follow distinct developmental trajectories (Zahn-Waxler & Robinson, 1995). Thus, future research should test whether the associations with parenting are similar among the different antisocial and prosocial constructs.

Our sample also presented some limitations. Specifically, we studied a high risk (i.e., arrested) sample of boys. This methodology likely led to greater variability in CU traits, prosocial behavior, delinquency, and aggression than would be found in community samples, but it does mean that our findings may not generalize to such samples. The applicability of these findings to girls is also unknown. Also, as is typically the case in high-risk samples, a large number of participants were residing in homes without a father or primary male caregiver. As a result, we could only investigate the influence of warmth and hostility from maternal caregivers; the parenting practices of paternal caregivers requires further study.

Finally, the focus of the current analyses was on the associations among different dimensions of parenting with child delinquency, aggression, CU traits, and prosocial behavior over adolescence. A strength of our study was our repeated measurement over time, which allowed us to estimate time-varying effects, to covary time-varying effects of control variables, and to separate between-individual and within-individual effects in these associations. We feel that these analyses provided the strongest test of our primary study hypotheses. As a result, we did not focus on testing the directionality of these relationships, given that this has been the focus of a substantial amount of past research, which has generally reported bidirectional effects between parenting and child antisocial behavior (Pinquart, 2017) and between parenting and prosocial outcomes (Waller et al., 2014). Thus, we assume that that the associations we report reflect bidirectional processes based on past research, but these were not directly tested in the current study. Further, although our longitudinal methodology allowed us to make strong conclusions on the predictive associations between parenting and child outcomes, it does not allow for us to make causal conclusions, given that unmeasured third variables could still influence the predictive associations we found.

Despite these limitations, our results provide strong evidence for a model of parenting in which parental warmth appears to be more strongly associated with CU traits and prosocial behavior, whereas parental hostility appears to be more strongly associated with delinquency and aggression. Such specificity in parenting influences needs to be considered in causal models for how antisocial behavior develops, especially models that use CU traits to specify a subgroup of antisocial youth with unique causal factors underlying their behavior problems. Further, these findings support enhancing existing interventions for preventing and treating antisocial and aggressive behavior in these youths by focusing on increasing warmth in the parent–child relationship. While such

modifications of parenting interventions have been preliminarily tested in young children and require more stringent testing, our results suggest that these modifications may also be beneficial in interventions designed to reduce aggression and delinquency in adolescents.

## References


Allison, P. D. (2005). *Fixed effects regression methods for longitudinal data using SAS*. SAS Institute.

Allison, P. D. (2009). *Fixed effects regression models*. SAGE. https://doi.org/10.4135/9781412993869

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Baumrind, D. (1972). An exploratory study of socialization effects on Black children: Some Black–White comparisons. *Child Development*, *43*(1), 261–267. https://doi.org/10.2307/1127891

Burt, S. A. (2012). How do we optimally conceptualize the heterogeneity within antisocial behavior? An argument for aggressive versus nonaggressive behavioral dimensions. *Clinical Psychology Review*, *32*(4), 263–279. https://doi.org/10.1016/j.cpr.2012.02.006

Cardinale, E. M., & Marsh, A. A. (2020). The reliability and validity of the Inventory of Callous Unemotional Traits: A meta-analytic review. *Assessment*, *27*(1), 57–71. https://doi.org/10.1177/1073191117747392

Clark, J. E., & Frick, P. J. (2018). Positive parenting and callous–unemotional traits: Their association with school behavior problems in young children. *Journal of Clinical Child and Adolescent Psychology*, *47*(Suppl. 1), S242–S254. https://doi.org/10.1080/15374416.2016.1253016

Conger, R. D., Ge, X., Elder, G. H., Jr., Lorenz, F. O., & Simons, R. L. (1994). Economic stress, coercive family process, and developmental problems of adolescents. *Child Development*, *65*(2), 541–561. https://doi.org/10.2307/1131401

Demirtas, H., Freels, S. A., & Yucel, R. M. (2008). Plausibility of multivariate normality assumption when multiply imputing non-Gaussian continuous outcomes: A simulation assessment. *Journal of Statistical Computation and Simulation*, *78*(1), 69–84. https://doi.org/10.1080/10629360600903866

Eisenberg, N., Spinrad, T. L., & Knafo-Noam, A. (2015). Prosocial development. In M. E. Lamb & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: Socioemotional processes* (7th ed., Vol. 3, pp. 610–656). Wiley. https://doi.org/10.1002/9781118963418.childpsy315

Espelage, D. L., Mebane, S. E., & Adams, R. S. (2004). Empathy, caring, and bullying: Toward an understanding of complex associations. In D. L. Espelage & S. M. Swearer (Eds.), *Bullying in American schools: A social-ecological perspective on prevention and intervention* (pp. 37–61). Routledge. https://doi.org/10.4324/9781410609700-11

Frick, P. J., & Kemp, E. C. (2021). Conduct disorders and empathy development. *Annual Review of Clinical Psychology*, *17*, 391–416. https://doi.org/10.1146/annurev-clinpsy-081219-105809

Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014a). 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, and Allied Disciplines*, *55*(6), 532–548. https://doi.org/10.1111/jcpp.12152

Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014b). Can callous–unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents? A comprehensive review. *Psychological Bulletin*, *140*(1), 1–57. https://doi.org/10.1037/a0033076

Frick, P. J., & Viding, E. (2009). Antisocial behavior from a developmental psychopathology perspective. *Development and Psychopathology*, *21*(4), 1111–1131. https://doi.org/10.1017/S0954579409990071

Furman, W., & Buhrmester, D. (1992). Age and sex differences in perceptions of networks of personal relationships. *Child Development*, *63*(1), 103–115. https://doi.org/10.2307/1130905

Goulter, N., McMahon, R. J., Pasalich, D. S., & Dodge, K. A. (2020). Indirect effects of early parenting on adult antisocial outcomes via adolescent conduct disorder symptoms and callous-unemotional traits. *Journal of Clinical Child and Adolescent Psychology*, *49*(6), 930–942. https://doi.org/10.1080/15374416.2019.1613999

Hair, E. C., Moore, K. A., Garrett, S. B., Ling, T., & Cleveland, K. (2008). The continued importance of quality parent–adolescent relationships during late adolescence. *Journal of Research on Adolescence*, *18*(1), 187–200. https://doi.org/10.1111/j.1532-7795.2008.00556.x

Hawes, D. J., Price, M. J., & Dadds, M. R. (2014). Callous–unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. *Clinical Child and Family Psychology Review*, *17*(3), 248–267. https://doi.org/10.1007/s10567-014-0167-1

Hox, J. J. (2010). *Quantitative methodology series. Multilevel analysis: Techniques and applications* (2nd ed.). Routledge/Taylor & Francis Group.

Huizinga, D., Esbensen, F., & Weihar, A. (1991). Are there multiple paths to delinquency? *The Journal of Criminal Law & Criminology*, *82*(1), 83–118. https://doi.org/10.2307/1143790

Hyde, L. W., Waller, R., Trentacosta, C. J., Shaw, D. S., Neiderhiser, J. M., Ganiban, J. M., Reiss, D., & Leve, L. D. (2016). Heritable and nonheritable pathways to early callous–unemotional behaviors. *The American Journal of Psychiatry*, *173*(9), 903–910. https://doi.org/10.1176/appi.ajp.2016.15111381

Kimonis, E. R., Fleming, G., Briggs, N., Brouwer-French, L., Frick, P. J., Hawes, D. J., & Dadds, M. (2019). Parent–child interaction therapy adapted for preschoolers with callous–unemotional traits: An open trial pilot study. *Journal of Clinical Child and Adolescent Psychology*, *48*(Suppl. 1), S347–S361. https://doi.org/10.1080/15374416.2018.1479966

Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Munoz, L. C., Aucoin, K. J., & Morris, A. S. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. *International Journal of Law and Psychiatry*, *31*(3), 241–252. https://doi.org/10.1016/j.ijlp.2008.04.002

Kochanska, G. (1997a). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychology*, *33*(2), 228–240. https://doi.org/10.1037/0012-1649.33.2.228

Kochanska, G. (1997b). Mutually responsive orientation between mothers and their young children: Implications for early socialization. *Child Development*, *68*(1), 94–112. https://doi.org/10.2307/1131928

Kochanska, G., & Murray, K. T. (2000). Mother–child mutually responsive orientation and conscience development: From toddler to early school age. *Child Development*, *71*(2), 417–431. https://doi.org/10.1111/1467-8624.00154

Krueger, R. F., Hicks, B. M., & McGue, M. (2001). Altruism and antisocial behavior: Independent tendencies, unique personality correlates, distinct etiologies. *Psychological Science*, *12*(5), 397–402. https://doi.org/10.1111/1467-9280.00373

Lansford, J. E., Godwin, J., Al-Hassan, S. M., Bacchini, D., Bornstein, M. H., Chang, L., Chen, B., Deater-Deckard, K., Di Giunta, L., Dodge, K. A., Malone, P. S., Oburu, P., Pastorelli, C., Skinner, A. T., Sorbring, E., Steinberg, L., Tapanya, S., Alampay, L. P., Uribe Tirado, L. M., & Zelli, A. (2018). Longitudinal associations between parenting and youth adjustment in twelve cultural groups: Cultural normativeness of parenting as a moderator. *Developmental Psychology*, *54*(2), 362–377. https://doi.org/10.1037/dev0000416

Malti, T., Ongley, S. F., Peplak, J., Chaparro, M. P., Buchmann, M., Zuffianò, A., & Cui, L. (2016). Children's sympathy, guilt, and moral reasoning in helping, cooperation, and sharing: A 6-year longitudinal study. *Child Development*, *87*(6), 1783–1795. https://doi.org/10.1111/cdev.12632

Malti, T., & Song, J. (2018). Social-emotional development and aggression. In T. Malti & K. H. Rubin (Eds.), *Handbook of child and adolescent aggression* (pp. 127–144). Guilford Press.

Marsee, M. A., Frick, P. J., Barry, C. T., Kimonis, E. R., Muñoz Centifanti, L. C., & Aucoin, K. J. (2014). Profiles of the forms and functions of self-reported aggression in three adolescent samples. *Development and Psychopathology*, *26*(3), 705–720. https://doi.org/10.1017/S0954579414000339

Marsee, M. A., Kimonis, E. R., & Frick, P. J. (2004). *Peer Conflict Scale* [Unpublished rating scale]. University of New Orleans.

McMahon, R. J., & Frick, P. J. (2019). Conduct and oppositional disorders. In M. J. Prinstein, E. A. Youngstrom, E. J. Mash, & R. A. Barkley (Eds.), *Treatment of disorders in childhood and adolescence* (4th ed., pp. 102–172). Guilford Press.

Meehan, A. J., Hawes, D. J., Salekin, R. T., & Barker, E. D. (2019). Shared and unique variances of interpersonal callousness and low prosocial behavior. *Psychological Assessment*, *31*(3), 376–388. https://doi.org/10.1037/pas0000675

Mills-Koonce, W. R., Willoughby, M. T., Garrett-Peters, P., Wagner, N., & Vernon-Feagans, L. (2016). The interplay among socioeconomic status, household chaos, and parenting in the prediction of child conduct problems and callous–unemotional behaviors. *Development and Psychopathology*, *28*(3), 757–771. https://doi.org/10.1017/S0954579416000298

Muñoz, L. C., Frick, P. J., Kimonis, E. R., & Aucoin, K. J. (2008). Types of aggression, responsiveness to provocation, and callous–unemotional traits in detained adolescents. *Journal of Abnormal Child Psychology*, *36*(1), 15–28. https://doi.org/10.1007/s10802-007-9137-0

Muratori, P., Lochman, J. E., Lai, E., Milone, A., Nocentini, A., Pisano, S., Righini, E., & Masi, G. (2016). Which dimension of parenting predicts the change of callous unemotional traits in children with disruptive behavior disorder? *Comprehensive Psychiatry*, *69*, 202–210. https://doi.org/10.1016/j.comppsych.2016.06.002

Pasalich, D. S., Dadds, M. R., Hawes, D. J., & Brennan, J. (2011). 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, and Allied Disciplines*, *52*(12), 1308–1315. https://doi.org/10.1111/j.1469-7610.2011.02435.x

Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. R. (1998). Using the correct statistical test for equality of regression coefficients. *Criminology*, *36*(4), 859–866. https://doi.org/10.1111/j.1745-9125.1998.tb01268.x

Patterson, G. R. (1982). *Coercive family process*. Castalia.

Perales, F., & Schunck, R. (2016). *Stata command 'XTHYBRID': Stata module to estimate hybrid and correlated random effect (Mundlak) models within the framework of generalized linear mixed models (GLMM)*. IDEAS. https://ideas.repec.org/c/boc/bocode/s458146.html

Pezzella, F. S., Thornberry, T. P., & Smith, C. A. (2016). Race socialization and parenting styles: Links to delinquency for African American and White adolescents. *Youth Violence and Juvenile Justice*, *14*(4), 448–467. https://doi.org/10.1177/1541204015581390

Pinquart, M. (2017). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology*, *53*(5), 873–932. https://doi.org/10.1037/dev0000295

Pinquart, M., & Kauser, R. (2018). Do the associations of parenting styles with behavior problems and academic achievement vary by culture? Results from a meta-analysis. *Cultural Diversity & Ethnic Minority Psychology*, *24*(1), 75–100. https://doi.org/10.1037/cdp0000149

Putnick, D. L., Bornstein, M. H., Lansford, J. E., Chang, L., Deater-Deckard, K., Di Giunta, L., Dodge, K. A., Malone, P. S., Oburu, P., Pastorelli, C., Skinner, A. T., Sorbring, E., Tapanya, S., Uribe Tirado, L. M., Zelli, A., Alampay, L. P., Al-Hassan, S. M., Bacchini, D., & Bombi, A. S. (2018). Parental acceptance-rejection and child prosocial behavior: Developmental transactions across the transition to adolescence in nine countries, mothers and fathers, and girls and boys. *Developmental Psychology*, *54*(10), 1881–1890. https://doi.org/10.1037/dev0000565

Querido, J. G., Warner, T. D., & Eyberg, S. M. (2002). Parenting styles and child behavior in African American families of preschool children. *Journal of Clinical Child and Adolescent Psychology*, *31*(2), 272–277. https://doi.org/10.1207/S15374424JCCP3102_12

Ray, J. V., & Frick, P. J. (2020). Assessing callous–unemotional traits using the total score from the Inventory of Callous–Unemotional Traits: A meta-analysis. *Journal of Clinical Child and Adolescent Psychology*, *49*(2), 190–199. https://doi.org/10.1080/15374416.2018.1504297

Ray, J. V., Frick, P. J., Thornton, L. C., Wall Myers, T. D., Steinberg, L., & Cauffman, E. (2017). Callous–unemotional traits predict self-reported offending in adolescent boys: The mediating role of delinquent peers and the moderating role of parenting practices. *Developmental Psychology*, *53*(2), 319–328. https://doi.org/10.1037/dev0000210

Ray, J. V., Frick, P. J., Thornton, L. C., Wall Myers, T. D., Steinberg, L., & Cauffman, E. (2019). Estimating and predicting the course of callous–unemotional traits in first-time adolescent offenders. *Developmental Psychology*, *55*(8), 1709–1719. https://doi.org/10.1037/dev0000748

Roberts, W., Strayer, J., & Denham, S. (2014). Empathy, anger, guilt: Emotions and prosocial behaviour. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, *46*(4), 465–474. https://doi.org/10.1037/a0035057

Schunck, R., & Perales, F. (2017). Within- and between-cluster effects in generalized linear mixed models: A discussion of approaches and the xthybrid command. *The Stata Journal*, *17*(1), 89–115. https://doi.org/10.1177/1536867X1701700106

Simmons, C., Rowan, Z., Knowles, A., Steinberg, L., Frick, P. J., & Cauffman, E. (2019). A life history approach to understanding juvenile offending and aggression. *Aggression and Violent Behavior*, *49*, 101317. https://doi.org/10.1016/j.avb.2019.07.012

Simmons, C., Steinberg, L., Frick, P. J., & Cauffman, E. (2018). The differential influence of absent and harsh fathers on juvenile delinquency. *Journal of Adolescence*, *62*, 9–17. https://doi.org/10.1016/j.adolescence.2017.10.010

Sng, K. I., Hawes, D. J., Hwang, S., Allen, J. L., & Fung, D. S. S. (2020). Callous–unemotional traits among children and adolescents in Asian cultures: A systematic review. *Journal of Cross-Cultural Psychology*, *51*(7–8), 576–596. https://doi.org/10.1177/0022022120944475

Sng, K. I., Hawes, D. J., Raine, A., Ang, R. P., Ooi, Y. P., & Fung, D. S. S. (2018). Callous unemotional traits and the relationship between aggressive parenting practices and conduct problems in Singaporean families. *Child Abuse & Neglect: The International Journal*, *81*, 225–234. https://doi.org/10.1016/j.chiabu.2018.04.026

StataCorp. (2017). *Stata statistical software: Release 15*. StataCorp LLC. https://stata.com

Steinberg, L., Mounts, N. S., Lamborn, S. D., & Dornbusch, S. M. (1991). Authoritative parenting and adolescent adjustment across varied ecological niches. *Journal of Research on Adolescence*, *1*(1), 19–36.

Stern, J. A., & Cassidy, J. (2018). Empathy from infancy to adolescence: An attachment perspective on the development of individual differences. *Developmental Review*, *47*(2), 1–22. https://doi.org/10.1016/j.dr.2017.09.002

Thomas, A. G., Ozbardakci, N., Fine, A., Steinberg, L., Frick, P. J., & Cauffman, E. (2018). Effects of physical and emotional maternal hostility on adolescents' depression and reoffending. *Journal of Research on Adolescence*, *28*(2), 427–437. https://doi.org/10.1111/jora.12345

Thornberry, T. P., & Krohn, M. D. (2000). The self-report method for measuring delinquency and crime. *Criminal Justice*, *4*, 33–83. https://www

.ojp.gov/ncjrs/virtual-library/abstracts/self-report-method-measuring-delinquency-and-crime

von Hippel, P. T. (2013). Should a normal imputation model be modified to impute skewed variables? *Sociological Methods & Research*, *42*(1), 105–138. https://doi.org/10.1177/0049124112464866

Waller, R., Gardner, F., & Hyde, L. W. (2013). What are the associations between parenting, callous–unemotional traits, and antisocial behavior in youth? A systematic review of evidence. *Clinical Psychology Review*, *33*(4), 593–608. https://doi.org/10.1016/j.cpr.2013.03.001

Waller, R., Gardner, F., Shaw, D. S., Dishion, T. J., Wilson, M. N., & Hyde, L. W. (2015). Callous–unemotional behavior and early-childhood onset of behavior problems: The role of parental harshness and warmth. *Journal of Clinical Child and Adolescent Psychology*, *44*(4), 655–667. https://doi.org/10.1080/15374416.2014.886252

Waller, R., Gardner, F., Viding, E., Shaw, D. S., Dishion, T. J., Wilson, M. N., & Hyde, L. W. (2014). Bidirectional associations between parental warmth, callous unemotional behavior, and behavior problems in high-risk preschoolers. *Journal of Abnormal Child Psychology*, *42*(8), 1275–1285. https://doi.org/10.1007/s10802-014-9871-z

Waller, R., Hyde, L. W., Klump, K. L., & Burt, S. A. (2018). Parenting is an environmental predictor of callous–unemotional traits and aggression: A monozygotic twin differences study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *57*(12), 955–963. https://doi.org/10.1016/j.jaac.2018.07.882

Wechsler, D. (1999). *Wechsler Abbreviated Scale of Intelligence*. Psychological Corporation.

Weinberger, D. A., & Schwartz, G. E. (1990). Distress and restraint as superordinate dimensions of self-reported adjustment: A typological perspective. *Journal of Personality*, *58*(2), 381–417. https://doi.org/10.1111/j.1467-6494.1990.tb00235.x

Wilkinson, S., Waller, R., & Viding, E. (2016). Practitioner review: Involving young people with callous unemotional traits in treatment—does it work? A systematic review. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *57*(5), 552–565. https://doi.org/10.1111/jcpp.12494

Williams, L. R., & Steinberg, L. (2011). Reciprocal relations between parenting and adjustment in a sample of juvenile offenders. *Child Development*, *82*(2), 633–645. https://doi.org/10.1111/j.1467-8624.2010.01523.x

Wootton, J. M., Frick, P. J., Shelton, K. K., & Silverthorn, P. (1997). Ineffective parenting and childhood conduct problems: The moderating role of callous–unemotional traits. *Journal of Consulting and Clinical Psychology*, *65*(2), 301–308. https://doi.org/10.1037/0022-006X.65.2.292.b

World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). https://icd.who.int/

Yildirim, E. D., & Roopnarine, J. L. (2015). The mediating role of maternal warmth in the associations between harsh parental practices and externalizing and internalizing behaviors in Hispanic American, African American, and European American families. *Cultural Diversity & Ethnic Minority Psychology*, *21*(3), 430–439. https://doi.org/10.1037/a0038210

Zahn-Waxler, C., & Robinson, J. (1995). Empathy and guilt: Early origins of feelings of responsibility. In J. P. Tangney & K. W. Fischer (Eds.), *Self-conscious emotions: The psychology of shame, guilt, embarrassment, and pride* (pp. 143–173). Guilford Press.

Zlomke, K. R., Lamport, D., Bauman, S., Garland, B., & Talbot, B. (2014). Parenting adolescents: Examining the factor structure of the Alabama Parenting Questionnaire for adolescents. *Journal of Child and Family Studies*, *23*(8), 1484–1490. https://doi.org/10.1007/s10826-013-9803-5

Received February 18, 2021
Revision received May 27, 2021
Accepted August 10, 2021 ■