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Bidirectional Associations between Parenting Behavior and Child Callous-Unemotional Traits: Do Delinquent Peer Affiliations and/or Parental Psychopathology Moderate these Links?

Amber Rochelle Wimsatt

University of Tennessee - Knoxville, awimsatt@utk.edu

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I am submitting herewith a dissertation written by Amber Rochelle Wimsatt entitled "Bidirectional Associations between Parenting Behavior and Child Callous-Unemotional Traits: Do Delinquent Peer Affiliations and/or Parental Psychopathology Moderate these Links?." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Paula J. Fite, Major Professor

We have read this dissertation and recommend its acceptance:

Todd M. Moore, Deborah Welsh, Elizabeth Johnson

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

Bidirectional Associations between Parenting Behavior and Child Callous-Unemotional Traits:
Do Delinquent Peer Affiliations and/or Parental Psychopathology Moderate these Links?

A Dissertation Presented for
the Doctor of Philosophy
Degree

The University of Tennessee, Knoxville

Amber Rochelle Wimsatt

December 2014

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Dedication

To my Father and Mother for breaking the cycle.

Acknowledgements

At yet another milestone in my career, I am indebted to Paula J. Fite for her careful and dedicated oversight of this work. Your advice and endurance have been invaluable to me and I am grateful to have your mentorship and support. I give you my heartiest thank-you. Warmly, I also acknowledge Todd M. Moore for giving me both a space and an advocate. To John Lochman of the University of Alabama: This project would not have been possible without your gracious provision of data and resources. I am proud to have had your support. Finally, I am especially grateful to S. Tucker Childs. Thank-you, for enduring alongside me.

Abstract

The current study examined bidirectional associations between callous-unemotional (CU) traits and parenting dimensions and evaluated whether these associations changed as children aged. Furthermore, this study extended the literature by examining whether these relations were moderated by delinquent peer affiliation and/or parental depression. Proposed relations were examined using a longitudinal sample of 120 aggressive boys (59.6%) and girls (40.4%) who were in the 4th grade ($M = 10.56$ years, $SD = .56$) at baseline and were followed over four years. A series of generalized estimating equation [GEE] models revealed reciprocal relations between CU traits and corporal punishment. Consistent with expectation, corporal punishment predicted increases in CU traits and surprisingly CU traits predicted a trend for decreases in corporal punishment ($p = .09$) over time. There was a trend for poor involvement to predict increases in CU traits ($p = .06$) over time, however the inverse relation was not found. CU traits, poor positive parenting and inconsistent discipline were unrelated in both directions. Furthermore, the effects of CU traits on parenting dimensions and the effects of parenting dimensions appeared to be stable over time, with one exception. There was a trend for the negative association between CU traits and inconsistent discipline to strengthen as children aged ($p = .08$). Parental depression moderated the link between CU traits and poor positive parenting as well as the link between corporal punishment and CU traits. Further evaluation of significant interactions revealed that at low levels of depression there was a trend for CU traits to predict decreases in poor positive parenting ($p = .08$); however CU traits were unrelated to parenting at high levels of depression. Moreover, at high levels of depression, corporal punishment was predictive of increases in CU traits, but was unrelated to CU traits at low levels of depression. Finally, delinquent peer

affiliation did not moderate any of the proposed relations. Limitations, future directions and clinical implications are discussed.

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Introduction

Callous-unemotional (CU) traits in childhood, which include a lack of remorse or guilty feelings, an inability to take responsibility for one's actions, poor empathy, and shallow emotions (Barry et al., 2000; Frick, O'Brien, Wootton, & McBurnett, 1994), are associated with a host of negative short-term and long-term outcomes, including increased involvement in delinquent activity, higher rates of aggression and conduct problems, and greater likelihood of psychopathy in adulthood (Frick, Cornell, Barry, Bodin, & Dane, 2003; Frick et al., 2003; Frick et al., 1994; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Lynam, Loeber, & Stouthamer-Loeber, 2008). Given the vast set of negative psychosocial adjustment implications associated with the presence of CU traits in children, much of the literature has turned its attention to uncovering the processes by which CU traits are developed and maintained (Frick et al., 1994; Pardini, Lochman, & Powell, 2007; Pardini & Loeber, 2007). With the overarching goal of informing prevention and intervention efforts, a primary target of investigation has been the impact that various environmental factors may have on the developmental progression of CU traits (Barry, Barry, Deming, & Lochman, 2008; Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011; Pasalich, Dadds, Hawes, & Brennan, 2011). When considering the critical period of childhood and pre-adolescence for intervention (Frick, 1998), parenting behavior is arguably one of the most readily identifiable and important environmental factors investigated in the literature. Indeed, parents are frequently targeted in treatment paradigms for children, and the goal of these interventions is to identify and alter mutually maladaptive patterns of interaction between parents and children (Serketich & Dumas, 1996). Thus, understanding the impact of parenting and the ways in which parent and child

behavior mutually influence one another's behavior is crucial to our understanding of the development of CU traits.

There is some literature establishing links between parenting practices and the developmental progression of CU traits (Frick, Kimonis, Dandreaux, & Farell, 2003; Pardini et al., 2007). Preliminary evidence also suggests that CU traits result in changes in parenting over time (Hawes, Dadds, Frost, & Haskings, 2011). However, further investigation is needed before conclusions about these relations can be drawn. Furthermore, the impact that parenting has on child behavior and vice versa may change as children age. There is a characteristic shift in the nature of the parent-child relationship as youth gradually transition from childhood to adolescence, whereby parental influence on child behavior may weaken as children age (Frick, Kimonis, et al., 2003; Hartup, 1989; Steinberg & Silverberg, 1986). Clinically, treatment paradigms would benefit from tailoring interventions for children with CU traits based on the changing nature of the parent-child relationship. Therefore, in addition to examining how parent and child behavior influence one another, determining whether these relations change as children transition over time from childhood to early adolescence will clarify the developmental progression of CU traits further.

Finally, a child's environment is complex and includes multiple factors that have the potential to influence their and their parents' behavior. Taking into account the potential moderators of behavior are essential for formulating the most accurate models of the developmental pathways associated with child behavior and potential outcomes (Eddy, Dishion, & Stoolmiller, 1998). Thus, the relations between child CU traits and parenting behavior should be studied one step further to examine potential moderators of these bidirectional associations. The nature of a child's peer associations is one environmental factor that has been shown to have

an influence on both child and parent behavior (Deater-Deckard, 2001). When considering CU traits and negative parenting behaviors in particular, involvement with delinquent peers may influence the reciprocal relations between parenting and child behavior in important ways. Likewise, parental psychopathology, particularly the extent to which a child's caregiver is depressed, has also been shown to impact child and parent behavior (Lee, Lee, & August, 2011; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Trapolini, McMahon, & Ungerer, 2007). Thus, parental depression may also have an influence on the reciprocal relations between CU traits and parenting.

In sum, the goal of the current study was to further examine the bidirectional link between CU traits and parenting. More specifically, the reciprocal relations between CU traits and four parenting dimensions (i.e., inconsistent discipline, corporal punishment, poor involvement and poor positive parenting) were examined. Furthermore, this study examined whether there were changes in these relations as youth age. Finally, peer delinquency and caregiver depression were examined as moderators of these reciprocal relations.

Callous and Unemotional Traits: Definitions, Distinctions, and Development

In order to understand the developmental progression of antisocial behavior in adults, researchers have examined the extent to which psychopathic traits exist in youth (Barry et al., 2000; Frick, Bodin, & Barry, 2000; Frick et al., 1994). As a part of this work, CU traits have emerged as important components in the overarching concept of psychopathy in children and adolescents (Barry et al., 2000). CU traits represent the extent to which an individual has a tendency to demonstrate a shallow personal emotional experience, lack of empathy for others' social-emotional experience, and little to no guilt or remorse for wrongdoing (Frick et al., 2000; Pardini & Loeber, 2007). Briefly, the concept of psychopathy in the literature has worked toward

the identification of subgroups of antisocial individuals based on specific components of psychopathy (i.e., interpersonal, affective/emotional, behavioral, etc) rather than general characteristics and patterns of antisocial behavior (Cooke & Michie, 2001; Hare, 1998; Hart & Hare, 1997; Pardini & Loeber, 2007). Indeed, such subgrouping is useful from both clinical and etiological standpoints as different subgroups (e.g., conduct disordered individuals with and without CU traits) of antisocial behavior may be associated with different motivations, developmental trajectories and treatment outcomes (Frick et al., 2005; Hawes & Dadds, 2005). Among these subgroups, CU traits may best represent the affective features of psychopathy (Cooke & Michie, 2001).

Because CU traits are predictive of differential and often more negative outcomes than antisocial behavior alone (Frick, Cornell, et al., 2003; Frick et al., 2003; Frick et al., 2005), they have received consistent attention in the literature. For example, children with CU traits have been shown to have higher and more severe levels of aggression and conduct problems (Frick, Cornell, et al., 2003), and engage in higher levels of delinquent behavior over time than children without CU traits (Frick et al., 2005). Despite high co-occurrence and overlap (Dadds, Fraser, Frost, & Hawes, 2005; Frick et al., 2000), the literature supports a distinction between CU traits and general delinquent and antisocial behavior as well as diagnostic forms of conduct problems (i.e., Conduct Disorder [CD] and Oppositional Defiant Disorder [ODD]) occurring in childhood (Dadds et al., 2005; Fite, Greening, Stoppelbein, & Fabiano, 2009; Frick et al., 2000). Thus, CU traits are used to delineate certain subgroups of individuals demonstrating conduct problems and antisocial behavior (Blair, Peschardt, Budhani, Mitchell, & Pine, 2006; Frick et al., 2005; Frick & Viding, 2009), and are studied in terms of their unique contributions to child outcomes in the

literature. Indeed, not all children with conduct problems possess CU traits and vice versa (Fontaine et al., 2011; Frick et al., 1994).

From a theoretical standpoint, CU traits appear to be best understood from a developmental perspective (Kagen, 1984; Kochanska, 1991; Kochanska & Aksan, 2006; Maccoby & Martin, 1983). Psychopathic features have been described as arising from a temperamental style that renders children less likely to develop a sound internalized conscious, or an emotional and cognitive understanding as well as ownership of pro-social norms and behavior (Kagen, 1984; Kagen & Snidman, 1991; Kochanska, 1991; Maccoby & Martin, 1983). Specifically, the two components of a child's internalized conscious, (1) the ability feel uncomfortable and distressed by the guilt and remorse associated with engaging in undesirable behavior and (2) the ability to refrain from engaging in such behavior, are faulty in children with this particular temperamental style (Kagen & Snidman, 1991; Kochanska, 1997). These two components of the internalized conscious are thought to most closely represent the characteristic features of CU traits (Frick et al., 2000).

The development of the internalized conscious is thought to take place in the early years of a child's life and is aided by parents who further socialize the child by providing reinforcement cues and/or punishment cues to encourage appropriate social behavior and deter non pro-social behavior (Hoffman, 1983; Kagen, 1984; Kochanska, 1991, 1993). The punishment cues, which are used to shape the development of a conscious attuned to pro-social standards of emotional experience and behavior, work by way of causing anxiety, guilt and distress for wrongdoing (Hoffman, 1983; Radke-Yarrow, Zahn-Waxler, & Chapman, 1983). Children with a temperamental style rendering them less sensitive to these punishment cues may be at increased risk for the development of CU traits (Dadds & Salmon, 2003; Hoffman, 1983;

Pardini, 2006). This is likely because the development of their internalized conscious is less easily shaped by environmental cues. Indeed, studies have found that children high on CU traits are less sensitive to punishment cues (Blair, Colledge, & Mitchell, 2001) and are less likely to be concerned about punishment for aggression or other transgressions than youth low on CU traits (Pardini, Lochman, & Frick, 2003).

However, even children with temperamental styles that are ideal for the positive parental shaping process mentioned above can still be socialized to exhibit CU traits vis-à-vis parental influence. For instance, parents who are unable to model and reinforce the development of a sound (i.e., pro-social) internalized conscious, or those who model the opposite (i.e., non pro-social behavior), do not provide the same opportunity for their children to learn to refrain from engaging in socially destructive, interpersonally manipulative and otherwise antisocial forms of behavior (Hoffman, 1983; Maccoby & Martin, 1983). These experiences may place children at greater risk for the development of CU traits. Thus, in addition to child-driven factors (i.e., temperamental style), parenting behavior might also influence the extent to which children are at risk for developing a faulty internalized conscious, and in turn demonstrate CU traits. With these theoretical considerations in mind, it is possible to explore how CU traits and parenting behavior are associated.

Callous and Unemotional Traits and Parenting: Bidirectional Associations

Despite moderate to high stability over time (Frick, Cornell, et al., 2003; Frick et al., 2003; Frick et al., 2005), CU traits are not immune to environmental influence (Fontaine et al., 2011; Frick, Kimonis, et al., 2003; Pardini et al., 2007). Parent effects, while small, have been shown to impact these traits in children (Hawes et al., 2011; Pardini et al., 2007). Indeed, there is unidirectional evidence to suggest that parenting behavior, a major childhood environmental

factor, influences change in CU traits over time. Specifically, negative parenting has been associated with increases in CU traits, whereas positive forms of parenting have been shown to buffer against increases or promote decreases in CU traits (Frick, Kimonis, et al., 2003; Pardini et al., 2007). For instance, in their 4-year longitudinal study examining the predictive stability of psychopathic traits in children, Frick and colleagues (Frick, Kimonis, et al., 2003) found that both parent and youth report of negative parenting (inconsistent discipline, harsh punishment, poor involvement) was positively predictive of high levels of CU traits from childhood to early adolescence. Furthermore, positive warmth and involvement was associated with decreased levels of CU traits in this sample over time (Frick, Kimonis, et al., 2003). In another study, Pardini, Lochman, and Powell (2007) found that high levels of corporal punishment and low levels of parental warmth and involvement were positively associated with increases in CU traits over time in a sample of children.

In turn, Hawes and Colleagues (2011) found that CU traits were uniquely associated with changes in negative parenting behavior in children (8-11 years) over a one year period. Prior to this investigation no studies to date had examined the influence that CU traits might have on parenting behavior over time. This omission is not isolated to the CU specific literature however, as child-driven effects on parenting behavior for children with conduct and behavior problems in general have received relatively less attention in the literature than the inverse relations (Burke, Pardini, & Loeber, 2008). Nonetheless, this study found evidence that higher levels of CU traits were uniquely associated with increases in inconsistent discipline and corporal punishment over time in older children (8-11 year olds). Furthermore, higher levels of CU traits were associated with lower parental involvement over time in older boys and younger girls over time (Hawes et al., 2011). In addition to examining child-driven effects, this study represented the first

examination of the potential bidirectional relations between CU traits and specific facets of parenting. Hawes and colleagues (2011) found that CU traits and parental involvement were reciprocally related with one another such that high levels of CU traits were associated with lower levels of involvement and high levels of positive parental involvement predicted with lower levels of CU traits over time. Although this study has initiated an understanding of the cyclical and mutual influence that CU traits and parenting behavior have on one another, a complete understanding is not yet available. Thus, these relations are in want of further investigation.

The coercion model put forward by Patterson and colleagues conceptualizes the bidirectional nature of parent-child interactions (Patterson, 1982, 2002; Patterson, Reid, & Dishion, 1992). The model asserts that patterns of interactions between parents and children are developed, operated and maintained based on a complex series of reinforcement. For instance, when parents engage in inconsistent or harsh discipline in order to deter problem behavior, those parenting behaviors are reinforced if the child's negative behavior is reduced. In turn however, negative parenting behavior may elicit continued or worsened behavior from the child (Gershoff, 2002), which may induce further negative parental behavior (i.e., trying to reduce child behavior) or parental submission (i.e., parents 'give-up' and withdraw). Moreover, child behavior may disrupt parental discipline attempts and the resulting parenting behavior (i.e., inconsistent discipline) is in turn associated with further poor child behavior. In this way, the pattern of coercive behavior is cyclical and depends on a pattern of exchange between parents and children.

Social learning theory may provide an additional theoretical framework for examining bidirectional relations between parenting behavior and CU traits. Social learning theory posits that children acquire modes of behavioral and emotional interaction by observing and duplicating

models of behavior in their environment (Bandura, 1977). Likewise, individuals within the child's social environment further influence learned behavior by reinforcement of particular methods of interaction (Bandura, 1977). In short, modeling is a mechanism by which parents and other influential individuals in the environment socialize a child. Therefore, parenting behaviors such as positive involvement may serve to model and reinforce behavioral and emotional interactions more consistent with pro-social behavior, and may be associated with the decreases or low levels of CU traits over time as has been found in previous studies (e.g., Pardini et al., 2007). Furthermore, consistent and appropriate discipline, or parenting behavior that may help to reinforce pro-social methods of interpersonal interaction in children (i.e., serving to help induce guilt over wrongdoing, etc), may also be associated with decreases in CU traits over time. In contrast, inconsistent discipline and/or harsh parenting (e.g., corporal punishment) may allow behavior to go unchecked (inconsistent discipline) or model callous and harsh methods of social interaction (corporal punishment) and thus may be associated with the increases or high levels of CU traits over time as seen previously (Lynam et al., 2008).

On the other hand, CU traits may influence the ways in which parents respond to behavior and the particular styles they choose to engage in. The behavioral style associated with CU traits may be harder to socialize vis-à-vis more positive and consistent methods of parenting (Kochanska, 1997). CU traits may render children less responsive to positive styles, and exasperated and frustrated parents may resort to engaging in more harsh and inconsistent methods than more positive dimensions of parenting. In turn, this parenting may only serve to reinforce and model callous styles of interaction and increase CU behavior. That is, CU traits and parenting may be bidirectionally related.

Finally, the developmental shift that takes place as children transition from childhood to adolescence over time may impact the bidirectional relations between CU traits and parenting. Specifically, as children begin seeking emotional and behavioral autonomy from their parents as they move into early adolescence, it is possible that parenting behavior plays less of an influential role on child behavior (Steinberg & Silverberg, 1986). This change in parental influence may be due, at least in part, to the fact that peer group affiliation and involvement becomes increasingly influential on behavior as children age (Hartup, 1983, 1989). This shift is a part of normative development, and when children are affiliated with achieving, non-delinquent peers and parents grant autonomy in developmentally appropriate fashions, outcomes are optimal (Chen, Dornbusch, & Liu, 2007; Shucksmith, DHendry, & Glendinning, 1995; Steinberg & Silverberg, 1986).

As children age, it is possible that negative parenting has a diminished influence on CU traits and peers instead become one of the primary socialization sources for the early adolescent (Hartup, 1983, 1989). Thus, one might expect the link between negative parenting and CU traits to diminish as children age. On the other hand, CU traits if unable to be successfully addressed when children are younger may become ingrained and less amenable to change over time (Frick, Kimonis, et al., 2003). Such pervasive child behavior may still be associated with increases in negative parenting, especially withdrawal of involvement as opposed to more physical methods of punishment, as children age. In other words, pervasive levels of CU traits may result in parents becoming disenfranchised and essentially “giving up” on their parenting strategies (i.e., less likely to follow through with discipline, less likely to positively reinforce, etc), a process that has previously been supported in the bidirectional literature with other problem behaviors (Burke, Pardini, Loeber, 2008). Thus, the linear association between CU traits and negative

parenting may become stronger over time.

Delinquent Peer Affiliation and Parental Psychopathology as Moderators

In addition to providing support for and further clarification of previous findings, identifying the potential moderators of the bidirectional relations between parenting behaviors and CU traits will add significantly to conceptualizations of these associations in the literature. In particular, affiliation with delinquent peers and parental psychopathology (e.g., depression) may also impact the relations between parenting behavior and CU traits (Deater-Deckard, 2001; Kiesner & Kerr, 2004; Laird, Jordan, Dodge, Pettit, & Bates, 2001).

Child affiliation with delinquent peers is associated with problematic outcomes, including increased engagement in a variety of antisocial and delinquent behaviors (Dishion, Spracklen, Andrews, & Patterson, 1996; Stoolmiller, 1994; Vitaro, Brendgen, & Tremblay, 2000) by way of processes such as modeling and negative reinforcement (Snyder et al., 2010). Affiliation with delinquent peers may strengthen the relation between negative parenting and CU traits. Both parents and peers are strong socialization mechanisms for children (Bierman, 2004; Maccoby, 1992; Maccoby & Martin, 1983), and there is evidence to suggest that positive peer relations can buffer the impact of negative parenting on child behavior (Bolger, Patterson, & Kupersmidt, 1998; Lansford, Criss, Pettit, Dodge, & Bates, 2003).

In contrast, when negative behavior and a lack of warmth is modeled and reinforced by both parents and peers, an individual may be likely to demonstrate similar behaviors, such as CU traits. Indeed, in their study examining moderators of the link between peer deviancy training and antisocial behavior, Snyder and colleagues (2010) found that children with higher levels of coercive discipline (i.e., observations of parents' tendency to engage in strict and oppressive verbal, non-verbal and physical means of discipline, including sarcasm, negative affect [e.g.,

frowning, scowling], hitting, grabbing, etc) were more susceptible to peer deviancy training and were more likely to engage in antisocial behavior after training than children who received less coercive discipline. Thus, at high levels of peer delinquency, negative parenting behavior may be more strongly related to increases in CU traits over time, than at low levels of peer delinquency. A similar process may also be at work for the inverse relation. Specifically, CU traits (i.e., an impaired guilt response or lack of arousal for wrongdoing) may be further reinforced by affiliation with peers who condone behaviors that fit with this style of interaction. When extant CU traits and social involvement that reinforces these traits co-occur, parents may react negatively (Burke et al., 2008) in response to child behavior by engaging in increased levels of negative parenting behavior. That is, affiliation with delinquent peers may strengthen the relation between CU traits and increased levels of negative parenting (e.g., corporal punishment, inconsistent discipline, poor involvement, poor positive parenting) over time.

Finally, parental psychopathology, particularly caregiver depression, may also moderate the reciprocal associations between negative parenting and CU traits. Depression occurs frequently in caregivers, especially mothers (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993). Several studies have found that parental depression is often associated with various forms of child maladjustment, including problem behavior (Cummings, Keller, & Davies, 2005; Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007; Goodman & Gotlib, 1999; Trapolini et al., 2007). Caregivers who are depressed may have fewer resources to model appropriate modes of social interaction and may instead model negative emotionality, show low levels of involvement, and engage in inconsistent, reactant, hostile, and irritable forms of discipline (Goodman & Gotlib, 1999; Lovejoy et al., 2000; Marchand & Hock, 1998). These negative parenting behaviors may contribute to negative child behavioral and socialization outcomes as is detailed

above (Dadds, 1995). Negative parenting behavior (e.g., poor involvement, harsh/inconsistent discipline, etc) in combination with parental psychopathology likely results in a negative environment that does not readily model pro-social and caring behavior, ultimately resulting in increased CU traits. Thus, at high levels of parental depression, negative parenting behavior may be more strongly associated with increases in CU traits over time than at low levels of parental depression.

Again, a similar process may be at work when considering the inverse relation. Caregivers experiencing emotional difficulties in combination with a child that is not empathetic and calloused may resort to engaging in more negative parenting than caregivers who are more emotionally stable due to lack of emotional resources. In other words, one might expect that at high levels of parental depression, CU traits may be more strongly associated with increases in negative parenting than at low levels of parental depression.

The Current Study

In summary, the current study attempted to add clarity to the literature by further examining the bidirectional associations between negative parenting dimensions and CU traits. Specifically, this study examined the reciprocal link between parental corporal punishment, inconsistent discipline, poor involvement, low positive parenting and CU traits in a longitudinal sample of aggressive children. This study also examined whether there was a linear change in these relations as children aged. Finally, this study extended the literature by examining potential moderators of these relations.

First, it was hypothesized that CU traits and parenting would be reciprocally related. Because they model non pro-social methods of interaction and behavior, high levels of inconsistent discipline and corporal punishment and low levels involvement and positive

parenting were expected to be associated with increases in CU traits over time. On the other hand, high levels of CU traits may elicit parental reactivity and lower likelihood of engagement in positive forms of parenting, and thus were expected to be associated with increased levels of negative parenting over time.

Moreover, given that the developmental transition from childhood to early adolescence may be related to changes in these relations over time, it was anticipated that the expected link between parenting and CU traits would diminish as children age. Inversely, pervasive expression of CU traits may result in increases in poor parental involvement, lower levels of positive parenting and more inconsistency as children begin the transition into early adolescence.

Second, it was hypothesized that affiliation with delinquent peers would moderate the bidirectional link between negative parenting behavior and CU traits. Specifically, the highest levels of CU traits were expected to occur when both parents and peers model negative social processes. Thus, at high levels of delinquent peer affiliation, negative parenting was expected to be more strongly associated with increases in CU traits over time than at low levels of delinquent peer affiliation. In the opposite direction, callous methods of social interaction may be reinforced by involvement with peers who model and accept these behaviors. These strengthened traits may elicit parental reactivity in the form of worsened parenting behavior. Therefore, it was hypothesized that at high levels of delinquent peer affiliation, CU traits would be more strongly associated with increases in negative parenting than at low levels of delinquent peer affiliation.

Finally, it was anticipated that parental depression would moderate the bidirectional link between parenting behavior and CU traits. Negative parenting in conjunction with the negative implications of parental depression may create a cumulative risk for an environment that does not readily model and reinforce pro-social behavior. Thus, it was expected that at high levels of

parental depression, negative parenting would be more strongly associated with increases in CU traits over time. Inversely, the combination of extant CU traits and the lack of appropriate parental emotional response due to depressive symptomatology may result in overly harsh physical discipline, inconsistent discipline, low levels of positive parenting, and/or a lack of involvement. Therefore, it was hypothesized that at high levels of parental depression, CU traits would be more strongly associated with increases in negative parenting than at low levels of parental depression.

Note that although parent-child reciprocal effects are viewed as important, small reciprocal parent-child effects are typically reported in the literature (Hawes et al., 2011; Pardini & Loeber, 2007). In accordance, the current study focused on an aggressive sample of youth in order to increase the likelihood that the traits of interest were evident and increase the odds of detecting proposed relations.

Method

Participants

Proposed relations were examined in a sample of 120 children recruited as a part of a previous investigation of a school-based intervention program for aggressive children called the Coping Power Program (Lochman, Boxmeyer, Powell, Roth, & Windle, 2006). The previous study was a randomized control intervention trial, which examined the effectiveness of a manualized cognitive-behavioral therapy for aggressive children in the school system (Lochman et al., 2006). Briefly, participants for the larger study were recruited over a period of three years from 10 different elementary schools in an urban city located in the Southeastern United States. Children whose teachers rated them as being in the top 30% of fourth grade students on aggression the summer prior to their fifth grade academic year were offered the opportunity to

participate in the Coping Power Program (Dodge & Coie, 1987). Two hundred and eighty-four families with eligible children were contacted for participation. Of these eligible participants, 240 consented to participation and 120 were randomized to the treatment condition and 120 to the control (i.e., no treatment) condition. Only participants from the control treatment condition were examined in the current study so that results were not affected by the intervention. Further information and figures regarding the recruitment of the participants to the overarching study are detailed extensively elsewhere (Pardini et al., 2007).

The 120 participants in the current study were in the 4th grade ($M_{\text{age}} = 10.56$ years, $SD = .56$) at baseline and were composed of 59.6% boys and 40.4 % girls. The majority of participants were either African American (63.03%) or Caucasian (35.29%) and the remaining participants (1.68%) were classified as ‘Other’ racial background (i.e., Hispanic, Asian, Mixed Race). At the initial assessment, the majority of children resided either with both (32.8%) or one (32.8%) of their biological parents or their biological mother and a non-biological male caregiver (24.4%). The remainder of children (10%) had ‘other’ living arrangements, which may have consisted of any combination of grandparents, their father only, or other relatives (e.g., aunt, or uncle). Household income ranged from no income (welfare dependent) to over 100,000 per year, with the majority of families reporting an income between \$25,000 and \$29,999 per year. Finally, 30.25% of the sample reported an average family income less than 15,000 per year.

Procedures

All study procedures, questionnaires and interventions were approved by the University Institutional Review Board prior to data collection. Eligible parents and children provided consent and assent respectively for study participation. Parents, teachers and children provided data at four assessment points, approximately 1 year apart. During each of the four assessment

periods, trained study staff administered questionnaires to parents and children in an interview format. Arrangements were made such that the majority of interviews (> 90%) took place in the participant's home, unless a family requested an alternate location (e.g., the study laboratory, a public library). In these instances, study staff would make reasonable attempts to accommodate the family's requested meeting location. Parents and children were interviewed separately in order to ensure confidentiality of responding. Study staff read questions aloud and recorded subsequent responses, checking for understanding and clarifying questions when necessary. Baseline parent and child report was collected during the summer following the child's fourth grade academic year and was collected each summer thereafter for a total of four assessments. Following the initial assessment, trained study staff contacted families each summer to schedule their annual follow-up assessment.

In order to reduce attrition and maintain yearly contact with the families, study staff obtained updated contact information, including information for friends and relatives who may be able to assist staff in contacting the family during each data collection period. In addition, staff obtained consent to access the students' school and academic records to track the student's location and make contact with the family should they become unreachable. Letters were sent to the participants' last known address if they were unable to be contacted by any of the methods listed above. Finally, parents were compensated \$35 and children \$10 for completion of questionnaires at each of the four time points to encourage participation. Retention for the current study was 91.67% at time two, 85.83% at time three and 83.33% at time four.

Parents consented to have their child's teacher complete questionnaires regarding their child's behavior at each time point. Teachers completed paper and pencil questionnaires independently at each assessment period and were not compensated for their participation.

Teachers completed their initial assessment during the first few weeks of the child's fifth grade academic year and follow-up data were collected approximately 1-year later for a total of four assessment waves.

Measures

Demographic Information. At the initial assessment caregivers were administered a questionnaire that elicited demographic information regarding their child including their child's age, gender, racial background and current living arrangements. Furthermore, parents estimated their average family income using a scale ranging from 0 to 12 (0- no income/welfare and 12- \$100,000+) for the amount of money they earned in the past 12 months.

CU Traits. Parent and teacher's completed the six-item CU subscale on their respective versions of the Antisocial Processes Screening Device (APSD), a valid and reliable measure used to assess childhood features of psychopathy (Frick & Hare, 2001). Parents and teachers rated items on the CU subscale (e.g., 'does not show emotions', 'feels guilty/bad when he/she has done something wrong') using a 3-point scale (0- not at all true to 2-very true). Items were summed such that higher scores reflect higher levels of CU traits. The CU scale of the APSD has been widely used in empirical research with both clinical and community samples (Frick et al., 2000; Frick et al., 1994) and has been beneficial in differentiation and identification of subgroups of severely antisocial youth (Barry et al., 2000; Frick et al., 2003; Frick et al., 2005).

In order to make more direct comparisons with previous studies utilizing parent and teacher report of CU traits (e.g., Frick et al., 2005; Pardini et al., 2007), parent and teacher report were combined at each of the four assessment waves, taking the higher of the two informants ratings for each item. In instances where only one informant's rating was available, that informant's report was used in isolation. Examining the data in this way allowed for a

representation of the child's behavior in multiple settings and was also beneficial in circumventing potential underreporting (i.e., may have not had the opportunity to observe the trait in the particular setting) for any one reporter (Frick et al., 2005). Finally, results of studies that combine parent and teacher report in this way are similar to those that have used different procedures (e.g., Piacentini, Cohen, & Cohen, 1992). Internal consistencies for the current data were adequate across each of the four time points ($\alpha = .71$, $\alpha = .75$, $\alpha = .76$, $\alpha = .78$, respectively).

Antisocial Behavior. In order to control for other potentially confounding instances of antisocial behavior, combined caregiver and teacher report on the Behavior Assessment System for Children (BASC) conduct problems and aggression subscales was used in order to assess antisocial behavior at each time point. The BASC is a widely used valid and reliable questionnaire used to gain multiple informants' perceptions and observations of a child's social, emotional and behavioral functioning (Reynolds & Kamphaus, 1992). Specifically, the BASC allows for caregivers, teachers, and children to report on the extent to which the identified individual demonstrates a variety of externalizing (e.g., hyperactivity, aggression, rule breaking, etc.) and internalizing (e.g., anxiety, depression, somatization, etc.) symptoms and other indicators of adaptive functioning (e.g., social skills, study skills, leadership etc.; Reynolds & Kamphaus, 1992).

The aggression subscale consists of items aimed at measuring the child's tendency to engage in behavior designed to inflict physical (e.g., physically hitting or kicking others) or emotional harm (e.g., name calling, verbally threatening) to others and/or others' property (e.g., breaking others' personal belongings and possessions). Sample items include the following: 'threatens to hurt others', 'bullies others', and 'hits other children'. The conduct problems

subscale measures caregiver and teacher perception of the child's tendency to engage in various rule-breaking (e.g., cheating in school, etc.) and otherwise antisocial behavior (e.g., stealing, truancy, substance use, etc.). Sample items include the following: 'lies', and 'breaks the rules'.

Similar to the combination procedures described above for measurement of CU traits, both parent and teacher reports were combined, taking the highest score from each informant at each time point. Moreover, only items that were overlapping for both the parent and teacher report forms for both the aggression problems (10 items) and conduct problems (3 items) subscales were included (Reynolds & Kamphaus, 1992). Finally, in tandem with previous research (Pardini et al., 2007) two items from the conduct problems scale were omitted because the content of one item was conceptually identical to a CU trait ('shows a lack of concern for others' feelings') and because one was more closely indicative of peer deviancy ('has friends who are in trouble').

Informants rated their perceptions of the child's behavior in the past 6-months using a 4-point response scale (*0-Never, 1-Sometimes, 2-Often, and 3-Almost always*). Items were summed such that higher scores are associated with higher instances of antisocial behavior and averaged together to create an antisocial behavior composite score at each time point. Commensurate with previous research using this measurement of antisocial behavior (Pardini et al., 2007), alphas were consistently high across each of the four time points ($\alpha=.89$, $\alpha=.92$, $\alpha=.92$, $\alpha=.91$) suggesting good internal consistency of the measure.

Parenting Practices. Four dimensions of parenting were assessed using parent self-report of behavior on the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996). This measure has been empirically validated using multi-informant (parent, teacher and child report) parenting practices in a both a clinically referred and community-based matched sample

of children (Shelton et al., 1996). Shelton and colleagues (1996) found that parents' report of their own behavior showed a low association in general to a measure gauging the tendency to respond in a socially desirable fashion. Furthermore, parents' reports of their own parenting practices have been shown to correlate with observations of parents' behavior in previous investigations (Arnold, O'Leary, Wolff, & Acker, 1993).

In the current study, parents responded to items regarding their behavioral responses and reactions to child behavior in their home using a 5-point response scale (*1-Never, 2-Almost never, 3-Sometimes, 4-Often, and 5-Always*) at each time point. The 10-item parental involvement subscale (e.g., 'you have a friendly talk with your child', 'you ask your child about his/her day in school') and the 6-item positive parenting subscales (e.g., 'you show affection when your child does something good', 'you tell your child that you like it when he/she helps around the house') were used as indices of caregivers' tendency to engage in positive, warm and involved parenting behaviors. Because a main interest of the current study was examining the extent to which negative parenting impacts CU traits, items were reverse scored, summed and averaged such that higher scores reflected lower levels of positive parenting and involvement. Alphas for the parental involvement subscale increased at time three and four and in general were acceptable to high ($\alpha = .79, \alpha = .76, \alpha = .83, \alpha = .84$, respectively). Internal consistencies for the positive parenting subscale were also acceptable to high across time ($\alpha = .76, \alpha = .77, \alpha = .74, \alpha = .83$, respectively).

Characteristically negative dimensions of parenting were assessed using parent report on the 6-item inconsistent discipline subscale (e.g., 'do you let your child get away with things?', 'if a punishment has been decided upon, can your child change it by explanations, arguments, or excuses?') and the 3-item corporal punishment subscale (e.g., "You slap your child when s/he

has done something wrong”). Items were summed and averaged such that higher scores reflected more negative levels of parenting for both subscales. Alphas for the inconsistent parenting subscale were modest and generally consistent over time ($\alpha = .65$, $\alpha = .68$, $\alpha = .73$, $\alpha = .65$, respectively). Finally, internal consistencies for the corporal punishment subscale were consistently low across the four time points ($\alpha = .40$, $\alpha = .46$, $\alpha = .55$, $\alpha = .57$, respectively).

Low to moderate internal consistencies for the corporal punishment subscale have been observed in previous empirical studies (Dadds, Maujean, & Fraser, 2003; Pardini et al., 2007) and may be associated with the low number of items (Shelton et al., 1996). Previous studies may have accounted for this issue by creating a ‘negative parenting’ composite by summing and averaging the inconsistent parenting and corporal punishment scales (Frick, Kimonis, et al., 2003) on this measure. However, studies utilizing multiple dimensions of parenting (Dadds et al., 2005; Frick et al., 2000) rather than global dimensions (Larsson, Viding, & Plomin, 2008) may be better able to detect child-driven effects when examining bidirectional relations between parenting and child behavior. Thus, the current study examined corporal punishment as a separate dimension in tandem with most recent research (Hawes et al., 2011).

Caregiver Depression. Caregiver depression was assessed using caregiver self-report on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) at each time point. The BDI is a 21-item self-report measure that assesses for severity of an individual’s experience of depression and has been widely used both clinically and empirically (Beck, Steer, & Carbin, 1988). Likewise, there is extensive literature supporting the psychometric properties of this measure, which suggest sound reliability and validity across a number of different populations (e.g., Beck et al., 1988; Beck et al., 1961; Strober, Green, & Carlson, 1981; Visser, Leentjens, Marinus, Stiggelbout, & van Hilten, 2006). Caregivers indicated the extent to which

they were experiencing various depressive symptoms using a 4-point scale (e.g., 0- *I do not feel sad*, 1-*I feel sad*, 2-*I am sad all the time and I can't snap out of it*, 3-*I am so sad or unhappy that I can't stand it*). Items were summed such that higher totals were indicative of more severe levels of depression. Beck and colleagues (1961) standard cutoffs for severity of depression on this scale are as follows: 0-9 minimal, 10-18 mild, 19-29 moderate, and 30-63 severe. However, in the current study total caregiver depression scores were examined continuously. Alphas for this measure were consistently high across each of the four time points ($\alpha = .87$, $\alpha = .91$, $\alpha = .90$, $\alpha = .91$, respectively) suggesting that internal consistency was good and did not appear to change across time.

Delinquent Peer Affiliation. Delinquent peer affiliation indexed using a composite created from youth report on the Center for Substance Abuse Prevention (CSAP) national youth survey. Specifically, youth completed three items designed to assess their perception of their close friends' attitudes toward the use of drugs and alcohol and three items designed to assess whether they associate with a best friend who utilized drugs and alcohol.

Previous empirical studies have included child and adolescent engagement in substance use in definitions of delinquent behavior (e.g., Vitaro, Pedersen, & Brendgen, 2007) as well as in measures assessing child and adolescent attitudes regarding delinquent behavior (Vitaro et al., 2000). Furthermore, affiliation with delinquent peers has been consistently isolated in the empirical literature as a strong environmental predictor of substance use (Fite, Colder, & O'Conner, 2006; Trucco, Colder, & Wieczorek, 2011). Previous literature has supported the reliability and validity of youth self-reports of substance use (MacKinnon & Dwyer, 2003) and children report initiation ages of 10 to 11 years in initial assessments of alcohol use (Hawkins et al., 1997) and self-reported current illicit substance use in youth as young as 12 years of age

(e.g., inhalants, prescription pills, etc; Substance Abuse and Mental Health Services Administration, 2011). Finally, such youth reports have been associated with delinquent peer affiliation in the expected direction (i.e., positively associated; Fite et al., 2006).

Thus, measuring child and adolescent perceptions of their peer group's acceptance of substance use as well as their friends' actual substance use, may be a rough marker of delinquent peer affiliation. In the current study participants rated their perceptions of their friends' attitudes about using drugs or alcohol (e.g., 'If your friends found out that you smoked cigarettes or used chewing tobacco, snuff or dip, how do you think they'd feel?') using a 4-point response scale (*0-They would approve, 1-They would disapprove but still be my friends, 2-They would disapprove and stop being my friends, and 3-They wouldn't care*). For analyses, these items were re-coded such that higher scores were associated with more peer acceptance of substance use (i.e., *0-They would disapprove and stop being my friends, 1-They would disapprove but still be my friends, 2-They wouldn't care, 3-They would approve*).

Likewise, participants were asked to rate whether their best friend used tobacco, consumed alcohol and/or used marijuana (e.g. 'Do you think your best friend smokes cigarettes or uses chewing tobacco, snuff or dip sometimes?') using a 2-point response scale (*0-No, and 1-Yes*). Items were recoded to map onto the 4-point response scale of the previous 3 items, such that *1-Yes* represented the highest level of endorsement of peer delinquency (i.e., a 3-point response) and *0-No* represented the lowest level of endorsement of peer delinquency (i.e., a 0-point response). Finally, responses for the six total items were summed such that higher scores represented higher levels of delinquent peer affiliation and averaged to create a peer delinquency composite score at each time point. Alphas for this rough index of delinquent peer affiliation were acceptable at each time point ($\alpha = .72, \alpha = .74, \alpha = .78, \alpha = .76$, respectively) suggesting

adequate internal consistency of the measure.

Data Analytic Plan

Preliminary analyses, including means, standard deviations, and skewness of observed study variables were first examined using SAS 9.3 statistical software. Next, missing data analyses were conducted in order to determine whether there were any notable differences between those who participated in each successive wave of data collection and those who did not.

The current study then examined bidirectional relations between CU traits and parenting behavior by estimating a series of generalized estimating equations [GEE] models utilizing STATA 12 statistical software. Given that effects for the proposed relations were likely to be small due to high stability (though, not immutability) in CU traits over time (e.g., Pardini et al., 2007), utilizing a technique that increased the likelihood of detecting such small effects was desirable. By collapsing all waves of longitudinal data across time GEE model estimates increases the number of observations by averaging across the population, which ultimately increases power and thus the ability to detect smaller effects.

Utilizing GEE models also allowed for examinations of repeated assessments of a single outcome over time (i.e., parenting behavior and CU traits; Horton & Lipsitz, 1999; Twisk, 2003). That is, this analytic procedure was able to accommodate data in which observations on a single participant were correlated across time. Again, given the stability of CU traits over time (Frick, Kimonis, et al., 2003), accommodation of these associations was particularly relevant for the examining the proposed relations. Additionally, this technique did not assume that waves of data were measured at equally spaced time intervals and thus was able to accommodate potential time lags in data collection listed above (e.g., variability in summer assessment periods from year to

year based on family availability; Twisk, 2003). Finally, utilizing GEE models allowed for ideal handling of missing data. Because these models included all non-missing pairs of data in analyses, only observations that a participant was missing at any one time point were excluded rather than all measurements for that participant (Horton & Lipsitz, 1999; Liang & Zeger, 1986; Twisk, 2003).

The current study estimated GEE transitional models, which are ideal for examining time-structured data whereby repeated observations on a particular outcome (i.e., CU traits and parenting dimensions) are utilized, to test the outlined relations. Individual models for each parenting dimension (poor positive parenting, poor involvement, inconsistent discipline, and corporal punishment) were estimated. Parenting dimensions were examined in separate models in order to better understand the specific nature of the bidirectional associations for a particular parenting behavior (Hawes et al., 2011).

In order to take into account repeated observations on the outcomes of interest, independent correlation structures and robust standard errors were also specified. Thus, the outcome variable (CU traits) at time $T + 1$ was regressed onto the same outcome variable (CU traits), the predicting parenting dimension and relevant demographic control variables (race and gender) at time T . This same process was repeated in the opposite direction whereby the outcome variables (parenting dimensions) at $T + 1$ were regressed onto the same outcome variable (parenting dimension), CU traits and relevant demographic control variables (race and gender) at time T . Parameter estimates represent the omnibus association between the independent and dependent variable across all assessments and were interpreted similarly to regression coefficients (Horton & Lipsitz, 1999).

Next, interactions with time were added to these models in order to determine whether

the effects of parenting on child CU traits and vice versa changes as children age. Finally, in an additional series of models, affiliation with delinquent peers and parental depression were added as potential moderators to the models to determine if bidirectional associations between parenting and CU traits depended on these variables (Figure 1).

Note that race was categorically divided to represent majority (i.e., Caucasian; 35.3%) and minority (i.e., African American, Hispanic, Other; 64.7%) group status for analyses. Further, in order to evaluate interaction effects, all variables were standardized prior to conducting analyses (Cohen, Cohen, West, & Aiken, 2003). Significant interactions were then probed at high and low values (1 standard deviation above the mean and 1 standard deviation below the mean, respectively) of the moderator in order to determine the nature of the interaction using standard procedures (Aiken & West, 1991).

Results

There were low levels of missing data across each of the four-time points for the study measures and there were no significant differences in the proportion of missing data between waves. Further analyses indicated that completers and non-completers did not differ significantly based on race, gender, or level of reported CU traits ($ps > .29$). Means and standard deviations of primary study variables for each of the four time-points are found in Table 1. Diagnostic variable analyses indicated acceptable skewness for all outcome variables, with values ranging from $-.007$ to $.75$ across all waves, suggesting that non-normality of the data was not a concern in the current study.

Parenting Predicting Changes in CU Traits

Results from the series of GEE models estimated to predict changes in combined parent and teacher reports of CU traits over time are found in Table 2. As was detailed above, a separate

model for each parenting dimension predicting changes in CU traits was estimated. With the exception of the model for involvement, where race was marginally statistically positively related to CU traits such that minority children demonstrated higher levels of CU traits than Caucasian youth ($B = .07, p = .09$), race ($Bs = .06$ to $.07, ps = .11$ to $.20$) nor gender ($Bs = .04$ to $.05, ps = .28$ to $.40$) were significantly associated with CU traits in any models. Antisocial behavior was uniquely positively predictive of CU traits in models for poor positive parenting and corporal punishment and was marginally statistically positively predictive of CU traits in the models for poor involvement and inconsistent discipline (Table 2). Finally, as anticipated, CU traits were stable over the 1-year lags in all models.

Of the four parenting dimensions examined, corporal punishment and poor parental involvement were positively predictive of CU traits over time, such that these parenting dimensions predicted increases in CU traits. However, the association for poor involvement was marginally statistically significant ($p = .06$). Poor positive parenting and inconsistent discipline were unrelated to CU traits over time (Table 2).

In order to determine whether the relations between parenting and CU traits changed as youth aged, cross product terms between the parenting dimensions and time were added to each of their respective models. None of the four parenting dimensions interacted with time to predict changes in CU traits ($Bs = -.05$ to $.04, ps = .31$ to $.72$), suggesting that the effects of parenting on CU traits did not change as these individuals aged.

CU Traits Predicting Changes in Parenting

Results from the series of GEE models estimated to predict changes in parenting practices over time are found in Table 3. Again, a separate model, whereby CU traits predicted changes in parenting, was estimated for each of the four dimensions. Gender was negatively

predictive of poor involvement, such that males were more likely to experience poor involvement than females ($B = -.09, p = .01$). Gender did not predict any other parenting dimension. Race was negatively associated with inconsistent discipline such that Caucasian parents were more likely to engage in high levels of inconsistent discipline over time than minority parents ($B = -.08, p = .06$). However, this association was only marginally statistically significant. Race did not predict any other parenting dimension. Antisocial behavior was positively associated with each of the four parenting dimensions, although this association was only marginally statistically significant for involvement (Table 3). All parenting dimensions demonstrated high levels of 1- year stability.

Contrary to expectation, CU traits predicted decreases in corporal punishment over time (Table 3). However, this association was only marginally statistically significant. CU traits did not predict changes in inconsistent discipline, involvement or poor positive parenting over time (Table 3).

When cross product terms between CU traits and time were added to each of the models, only one marginally statistically significant interaction emerged ($Bs = -.01$ to $.04, ps = .40$ to $.90$). Specifically, time interacted with CU traits to negatively predict a change in inconsistent discipline as children aged ($B = -.01, p = .08$; Figure 2). Findings suggested that the negative association between CU traits and inconsistent discipline is stronger as children age.

Delinquent Peer Affiliation and Parental Depression as Moderators

Delinquent peer affiliation and parental depression were added to each of the first order effect models described above in order to determine whether there were unique first order effects of these moderators. In order to determine whether delinquent peer affiliation and/or parental depression interacted with parenting to predict changes in CU traits over time, interactions with

the predicting parenting dimension and the proposed moderators were then added to each of the first-order effects models. Additionally, interactions between CU traits and the proposed moderator were added to each of the four parenting dimension models. Results for each moderator are discussed in turn.

Parenting Predicting Changes in CU Traits. Analyses indicated that affiliation with delinquent peers did not uniquely predict changes in CU traits over time in any model (B s = $-.04$ to $-.03$, p s $.32$ to $.40$). Furthermore, when examining the interactive effects of peer delinquency, youth affiliation with delinquent peers did not interact with any parenting dimension to predict changes in CU traits (B s = $-.02$ to $.02$, p s = $.67$ to $.97$).

Parental depression uniquely predicted increases in CU traits in the model for low levels of positive parenting ($B = .08$, $p = .05$), and was unrelated to changes in CU traits for any other parenting dimension model (B s = $.07$, p s = $.10$ to $.17$). Corporal punishment and parental depression positively interacted to uniquely predict increases in CU traits over time ($B = .07$, $p = .03$). Probing at high and low levels of parental depression revealed that at low levels of parental depression, corporal punishment was unrelated to CU traits ($B = .06$, $p = .23$). However, corporal punishment was related to increases to CU traits at high levels of depression ($B = .21$, $p = .000$; Figure 3). Parental depression did not interact with any other parenting dimension to predict changes in CU traits over time (B s = $-.01$ to $.07$ to, p s = $.30$ to $.90$).

CU Traits Predicting Changes in Parenting. Affiliation with delinquent peers was not uniquely predictive of changes in parenting over time for any dimension (B s = $-.03$ to $-.02$, p s $.40$ to $.60$). Furthermore CU traits did not interact with delinquent peer affiliation to uniquely predict changes in any parenting dimension (B s = $.01$ to $.05$, p s = $.22$ to $.91$).

Parental depression was uniquely predictive of increases in inconsistent discipline over time ($B = .21, p = .000$). Parental depression did not uniquely predict changes in any other parenting dimension ($Bs = -.03$ to $.05, ps .31$ to $.84$). CU traits and parental depression interacted to predict increases in poor positive parenting over time ($B = .10, p = .01$; Figure 4). Although probing at high and low levels of depression revealed that neither slope was statistically significant from zero, there was a trend for CU traits to predict decreases in poor positive parenting at low levels of depression ($B = -.11, p = .09$). However, at high levels of parental depression, CU traits were statistically unrelated to poor positive parenting over time ($B = .08, p = .17$).

Discussion

The present study attempted to clarify the current literature by further examining the unique bidirectional relations among various dimensions of negative parenting and CU traits over time. This study also sought to extend our current understanding of these relations by examining whether these relations changed as children aged and whether other important environmental factors, namely parental depression and affiliation with delinquent peers, moderated these bidirectional relations. Although parenting was found to predict CU traits, only one bidirectional effect was found. Specifically, CU traits and corporal punishment were reciprocally related. Further, not all associations were in the expected direction. Finally, parental depression, but not peer delinquency appears to impact the association between corporal punishment and CU traits. Findings are discussed in turn below.

Are Parenting Dimensions and CU Traits Bidirectionally Related?

Results from the current study suggest that CU traits and corporal punishment are reciprocally related. Specifically, the current study found that corporal punishment predicted

increases in CU traits over time. Surprisingly, however, CU traits predicted decreases rather than the expected increases in corporal punishment. The finding that corporal punishment predicted increases in CU traits was consistent with expectation and prior work (Hawes et al., 2011; Pardini et al., 2007). Harsh physical punishment may serve to model and reinforce callous methods of interaction (McCord, 2005). The finding in the opposite direction however, albeit marginally statistically significant, was not anticipated. Analyses indicated that CU traits were associated with decreases, rather than the expected increases, in corporal punishment over time. Given their experiences interacting with a child with CU traits, parents may begin to anticipate the impact that harsh punishment may have on these traits (e.g., no impact and/or exacerbation). This anticipation may render parents less likely to attempt to engage in physical punishment as a means of responding to CU traits over time. In other words, parents may ‘learn’ through experience that engaging in harsh physical punishment does not achieve the expected goals (i.e., decreases in CU traits). Parents may also reduce their physical tactics and employ other parenting dimensions aimed at reducing undesirable social and interpersonal behavior. For example, parents may resort to engaging in processes such as psychological control whereby parental undermining of the child’s emotional autonomy is utilized to produce desired thoughts, beliefs and/or behaviors (Barber, 2002; Barber & Harmon, 2002; Hawes et al., 2011; Pardini et al., 2007).

No other parenting dimensions were bidirectionally related to CU traits, however. Although poor parental involvement predicted increases in CU traits over time, the effect of CU traits on poor involvement was not found. The current finding for the positive link between involvement and CU is consistent with prior research (Hawes et al., 2011; Pardini et al., 2007) and expectation. That is, low levels of positive involvement may reduce parental opportunities to

model and reinforce pro-socially consistent behavioral and emotional interactions potentially leaving leeway for the development of more calloused interaction styles and thus increases in demonstration of CU traits. It was hypothesized that CU traits may reduce the extent to which parents are willing to extend positive interactions and involvement with their children as parents become disenfranchised with the child's behavior and essentially withdraw. However, the current findings did not support this notion. CU traits may play less of a role in this parenting dimension than in dimensions that might be driven by parental reactivity (i.e., corporal punishment), thus rendering CU traits unrelated to involvement.

Furthermore, inconsistent discipline, positive parenting and CU traits were unrelated in both directions. Although positive linkages between CU traits and inconsistent discipline have been found (Hawes et al., 2011), findings similar to the current results have been reported elsewhere (Pardini et al., 2007). Previous studies have found that positive parenting predicted decreases in CU traits over a 1-year period (Hawes et al., 2011). However, similar to the current study however, a prior investigation also reported that CU traits did not predict changes in positive parenting (Hawes et al., 2011). The fact that not all parenting dimensions were independently related to CU traits and vice versa raises two important considerations. First, these findings highlight the importance of differential associations between certain kinds of parenting and the relation to CU traits. That is, not all parenting dimensions impact child behavior equally and vice versa. Thus, interventions targeting more specific facets of parenting rather than broad and sweeping (i.e., positive versus negative parenting) behaviors may be most effective. Secondly, the lack of independent associations with CU traits and vice versa does not suggest that inconsistent parenting and poor positive parenting are unimportant in terms of understanding CU traits. Instead, when considering the dynamic nature of parenting and the likelihood of

parents employing multiple dimensions of parenting in tandem (Pettit & Mize, 1993), it is possible that inconsistent discipline and/or poor positive parenting may interact with other dimensions (i.e., corporal punishment, psychological control, behavioral control, etc) to predict CU traits. The child effects on these parenting dimensions might also best be understood in terms of whether they are moderated by other facets of parenting behavior. Thus, further research examining the interactive effects of various aspects of parenting will be an important next step.

Do Bidirectional Relations between Parenting and CU Traits Change as Children Age?

It was expected that given the developmental transition from childhood to adolescence whereby peers assume a more important role in socialization of youth (Hartup, 1989), the impact of parenting behavior on CU traits would diminish with age. However, the current results found that associations between parenting dimensions and CU traits did not change as children age. It was also expected that pervasive expression of CU traits may exacerbate negative parenting over time, namely increased levels of poor involvement and poor positive parenting and higher levels of inconsistency as parents become exasperated with their child and/or begin to withdraw. Contrary to expectation, current findings suggested a trend for a negative association between CU traits and inconsistent discipline to get stronger as children aged. That is, high levels of CU traits were associated with the low levels of inconsistent discipline, and this association got stronger as children aged. As parents make this shift in their own behavior in tandem with their child's gradual shift toward adolescence (Steinberg & Silverberg, 1986), it is possible that the consistency of discipline and assigning consequences suffers over time (in the absence of high CU traits) as parents negotiate the changing nature of parenting demands. On the other hand, when CU traits are high, parents may strengthen their efforts to engage in more consistent forms of discipline in response to these symptoms rather than withdrawing and essentially allowing

these traits to flourish unchecked. Although this singular finding provides some preliminary evidence (albeit not under the expected conditions) for the influence of time for this particular parenting dimension, overarching analyses largely do not support proposed hypotheses for change in CU traits and parenting as children age.

Rather than ruling out the influence of developmental transitions as a whole, these findings also offer two important points of consideration. First, this study specifically examined linear changes. Although there were no effects for linear changes in the current study (with the exception of the above marginally statistically significant interaction), future work should still consider examining specific developmental transitions for non-linear changes that may occur at these important periods of time. For instance, youth transition into puberty at different times and data that capture this event change would be more suitable for examining non-linear developmentally specific changes. Secondly, the lack of a link with time may be associated with the specific parenting dimensions examined in this study rather than indicating non-importance of time. That is, findings for time may have been different when considering different dimensions of parenting (e.g., psychological control and/or behavioral control).

Are Relations Moderated by Peer and Parent Environmental Factors?

The current study found mixed support for the question of whether relations between parenting and CU traits were explained by another ‘third’ variable, namely affiliation with delinquent peers and parental depression. Between these two environmental factors, parental depression emerged as an important player in explaining relations among parenting and CU traits. At the first order level, parental depression uniquely predicted increases in inconsistent discipline over time. Likewise, when poor positive parenting was predicting CU traits, parental depression was associated with increases in CU traits. More importantly, however, depression

helped to explain how corporal punishment impacts CU traits and how CU traits predict changes in poor positive parenting.

First, the anticipated relations for the impact of depression on the association between corporal punishment and CU traits were found. Analyses indicated that at high levels of depression, corporal punishment was associated with increases in CU traits and was unrelated to CU traits at low levels of depression. These results provide support for the hypothesis that depressed parents engaging in harsh negative parenting strategies (i.e., corporal punishment) would present a cumulative risk for an environment that does not readily model pro-social behavior, thus fostering increased CU traits over time. Because parents have fewer of the emotional resources to problem solve strategies to curb problematic child behaviors and interaction styles, parents may resort to reactionary discipline and become more likely to engage in harsh physical punishment (Lovejoy et al., 2000).

Depression also moderated the link between CU traits and poor positive parenting. Findings indicated that at low levels of depression, there was a trend for CU traits to predict decreases in poor positive parenting. It appears that high levels of CU traits result in parents improving their positive parenting skills when they are not experiencing high levels of depression. However, CU traits and poor parenting were not related when levels of parental depression were high. It is possible that when less depressed, parents have more emotional wherewithal and internal resources to combat expression of CU traits by modeling more positive methods of interaction with their children. Note, however, that these effects were only marginally statistically significant. Given these non-significant slopes, further investigation is warranted before conclusions about these relations should be drawn.

Ultimately, findings for the impact of parental depression in the current study raise the need to examine other parent driven environmental factors that may help to explain these relations further. For instance, parental engagement in antisocial behavior or antisocial attitudes might explain relations between CU traits and the current parenting dimensions as well as additional dimensions (e.g., psychological control).

Contrary to expectation, affiliation with delinquent peers did not moderate associations between parenting dimensions and CU traits in either direction as expected. It is possible that the current measure of delinquent peer affiliation did not adequately capture the important features of this construct rendering it less likely to find the proposed relations. Likewise, it is possible that another dimension of peer involvement could better explain changes in between parenting and CU traits over time. For instance, the quality of the friendships and level of closeness (i.e., time spent, shared interests, intimate exchange) with delinquent peers might better capture the nature of the impact that association with these peers may have on the link between parenting and CU traits. Indeed, children with close relationships with delinquent peers spend more time together increasing their likelihood of becoming socially similar (Berndt, 1996). Likewise, there is some evidence that suggests delinquent peers may engage in more interpersonal sharing when compared with other children (Giordano, Cernkovich, & Pugh, 1986; Houtzager & Baerveldt, 1999). Thus, rather than affiliation with delinquent peer alone, it may be that the extent to which children are close with members of his peer group is important in explaining relations between parenting behavior and CU traits. Thus additional facets of peers and peer relations are an important area for ongoing investigation in regards to CU traits.

Limitations and Future Directions

The current study should be viewed in light of its limitations. Although examining relations in an aggressive sample allowed for greater likelihood that the behaviors of interest were observed, this may limit generalizability to normal populations of children. In addition, it is possible that the current ‘rough’ measure of delinquent peer affiliation was unable to fully capture the essence of this construct thus handicapping our ability to find the relations of interest. Therefore, it is not possible to determine whether the null relations in the current study were a function of the measurement. Ongoing work should attempt to reexamine these relations utilizing a more deliberate measure of delinquent peer affiliation. Furthermore, inconsistent discipline showed modest internal consistency and corporal punishment had low internal consistency throughout the four waves. Although the alphas of the corporal punishment subscale have been reportedly low in previous studies (see: Essau, Sasagawa, & Frick, 2006; Shelton et al., 1996), largely due to the low number of items on the scale, future studies might utilize measures of inconsistent discipline and corporal punishment with greater levels of internal consistency. Future work might also consider the addition of youth report of parenting practices as youth perception of parents’ level of involvement and/or the extent to which they engage in positive parenting, inconsistent discipline and corporal punishment may have important implications for subsequent child behavior (Loney & Lima, 2003).

Finally, the high association between CU traits and antisocial behavior across the four waves may raise an important consideration regarding the ability to detect proposed relations. Specifically, there is a question of whether parceling out the variance associated with co-occurring antisocial behavior may have damped the ability to detect effects due to excluding the very variance that the study aimed to examine. However, it should be noted that in additional

analyses whereby the measure of antisocial behavior was removed from proposed models, findings on the whole trended in the same direction with little to no variability from findings where the more stringent models (i.e., controlling for antisocial behavior) were utilized. Thus, it can be argued that these findings provide further evidence that these relations are truly associated with the unique features of CU traits.

Despite these limitations and points of consideration, the current study tills the soil for ongoing work to continue to build our understanding of the interworking between child and parenting behavior. Future studies should examine other dimensions of parenting including psychological control to determine whether these factors influence changes in CU traits over time and vice versa. Furthermore, ongoing work should investigate whether parenting dimensions interact to predict CU traits and whether parenting dimensions moderate links between CU traits and parenting to predict changes in parenting dimension. Although the current moderators provided mixed support for the hypothesized relations, future work should assess whether other environmental factors moderate the links between parenting and CU traits, including parental attitudes toward and/or engagement in antisocial behavior as well as other facets of peer relations (e.g., friendship quality, supportive friendships, etc.).

Clinical Implications

Importantly, results of the current study foster important clinical gains. First, this study provides further support that despite their stability over time, CU traits are not immutable to environmental influence. Indeed, target parenting behaviors, particularly engagement in corporal punishment may help to disrupt the negative feedback cycle developed between parenting and CU traits over time. Psychoeducation about the nature of patterns developed over time and how they can be amended would be particularly helpful for parents. Findings also highlight the

importance of child driven effects on parents, indicating that not only parent behavior should be targeted. Finally, given the influence that parental depression has on parenting behavior and subsequently CU traits, targeting depression and emotional health in parents should be an important part of interventions.

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Appendices

Table 1. *Means and Standard Deviations for Observed Study Variables*

	4 th Grade		5 th Grade		6 th Grade		7 th Grade	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CU Traits	1.03	.38	1.00	.41	.95	.40	1.04	.42
Antisocial Behavior	1.04	.52	1.09	.57	.99	.56	1.04	.56
Inconsistent Discipline	2.39	.64	2.42	.63	2.35	.68	2.34	.58
Corporal Punishment	2.01	.61	1.82	.61	1.78	.65	1.77	.68
Poor Involvement	2.11	.56	2.15	.53	2.16	.59	2.22	.59
Poor Positive Par	1.69	.55	1.69	.51	1.87	.56	1.90	.56
Delinq Peer Affiliation	.76	.79	.71	.75	.86	.82	1.25	.88
Parental Depression	9.43	7.66	8.52	8.18	8.88	8.40	9.08	8.80

*Note: Poor Positive Par = poor positive parenting; Delinq Peer Affiliation = Delinquent Peer Affiliation

Table 2. *Parenting Dimensions Predicting Changes in CU Traits*

Predictors	CU Traits (<i>T</i> + 1)		
	<i>B</i>	<i>SE</i>	<i>z</i>
Inconsistent Discipline			
Prior CU Traits	.38***	.06	6.07
Inconsistent Discipline	.04	.05	.73
Antisocial Behavior	.12 ^a	.06	1.90
Time	.01	.06	.24
Gender	.04	.04	.86
Race	.06	.04	1.58
Corporal Punishment			
Prior CU Traits	.37***	.06	6.17
Corporal Punishment	.13**	.04	3.06
Antisocial Behavior	.12*	.06	2.02
Time	.02	.06	.27
Gender	.04	.04	.84
Race	.06	.11	.03
Poor Involvement			
Prior CU Traits	.37***	.06	6.06
Poor Involvement	.09 ^a	.05	1.91
Antisocial Behavior	.11 ^a	.06	1.74
Time	.01	.06	.24

Table 2. (continued)

Predictors	CU Traits ($T + 1$)		
	Combined Parent and Teacher Report		
	<i>B</i>	<i>SE</i>	<i>z</i>
Gender	.05	.04	1.09
Race	.07 ^a	.04	1.71
Poor Positive Parenting			
Prior CU Traits	.37***	.06	6.05
Poor Positive Parenting	.06	.05	1.21
Antisocial Behavior	.12*	.06	1.94
Time	.01	.06	.24
Gender	.04	.04	.89
Race	.07	.04	1.59

*** $p \leq .0001$; ** $p \leq .01$; * $p \leq .05$; ^a $p \leq .08$

Table 3. *CU Traits Predicting Changes in Parenting*

	Parenting Dimension (<i>T</i> + 1)		
	Parent Report		
	<i>B</i>	<i>SE</i>	<i>z</i>
Inconsistent Discipline (Outcome)			
Prior Inconsistent Discipline	.61***	.05	12.79
CU Traits	-.04	.05	-.76
Antisocial Behavior	.15***	.05	2.97
Time	.00	.05	.01
Gender	-.03	.04	-.74
Race	-.08 ^a	.04	-1.89
Corporal Punishment (Outcome)			
Prior Corporal Punishment	.66***	.05	14.11
CU Traits	-.08 ^a	.05	-1.71
Antisocial Behavior	.08*	.04	2.09
Time	.00	.05	.04
Gender	.00	.04	.10
Race	.03	.04	.68
Poor Involvement (Outcome)			
Prior Poor Involvement	.74***	.05	16.31
CU Traits	.02	.04	.64
Antisocial Behavior	.08 ^a	.05	1.86
Time	.02	.04	.35

Table 3. (continued)

	Parenting Dimension ($T + 1$)		
	Parent Report		
	<i>B</i>	<i>SE</i>	<i>z</i>
Gender	-.09**	.03	-2.67
Race	.02	.04	.63
Poor Positive Parenting (Outcome)			
Prior Poor Positive Parenting	.67***	.04	15.39
CU Traits	-.01	.05	-.18
Antisocial Behavior	.14**	.05	2.85
Time	-.01	.05	-.16
Gender	-.02	.04	-.55
Race	-.02	.04	-.64

*** $p \leq .0001$; ** $p \leq .01$; * $p \leq .05$; ^a $p \leq .09$

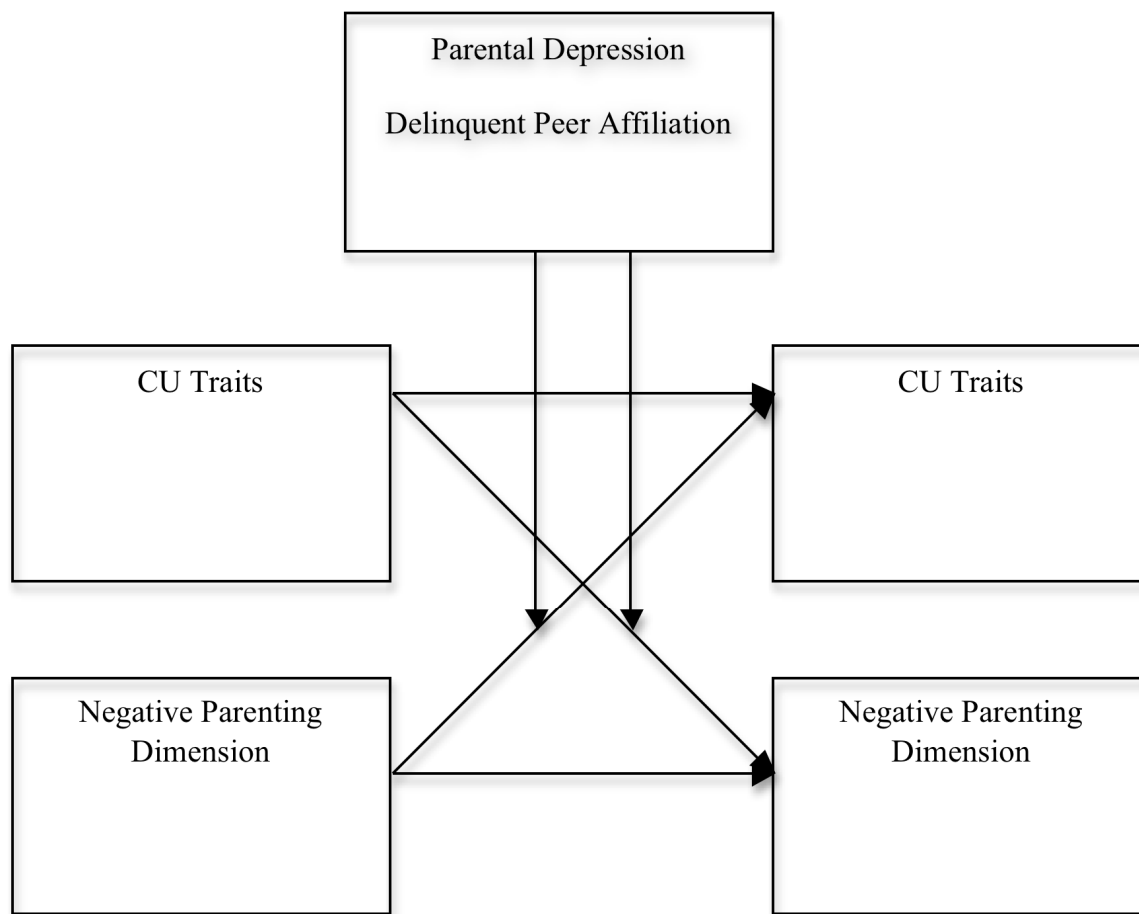


Figure 1. Proposed Model

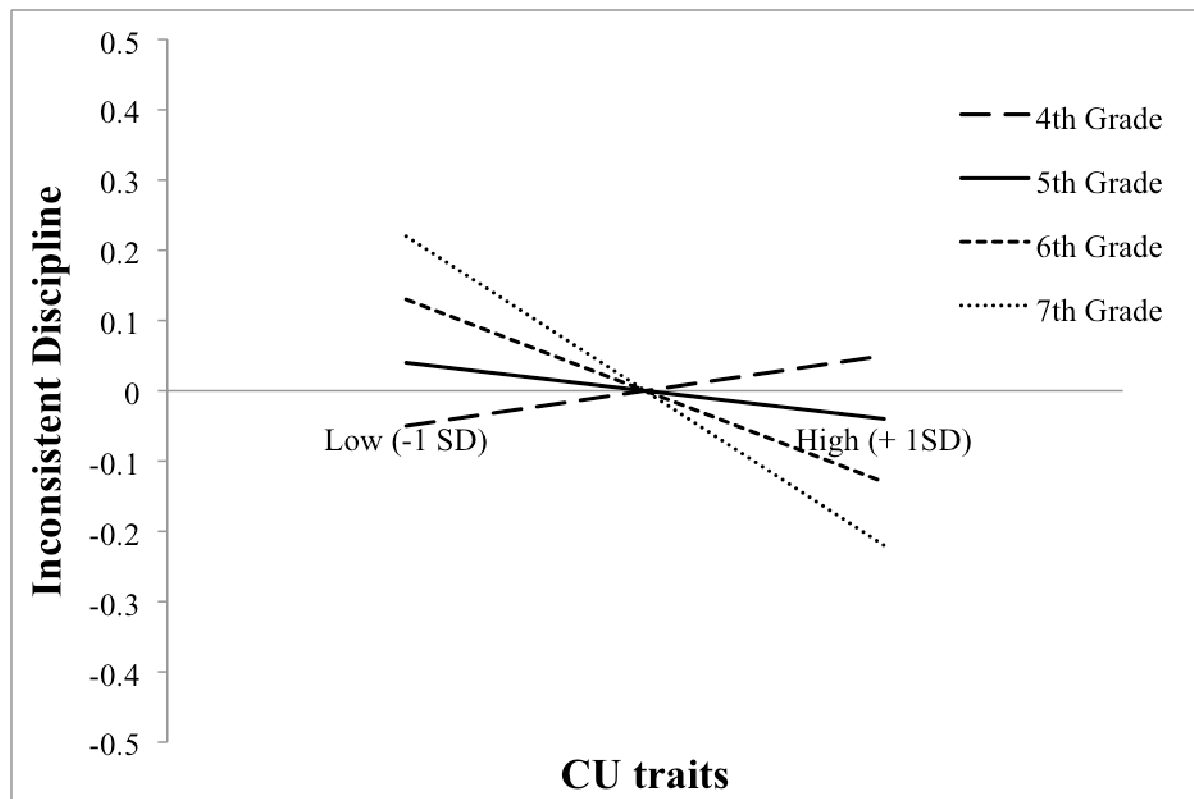


Figure 2. Time Moderates the Relation between CU Traits and Inconsistent Discipline

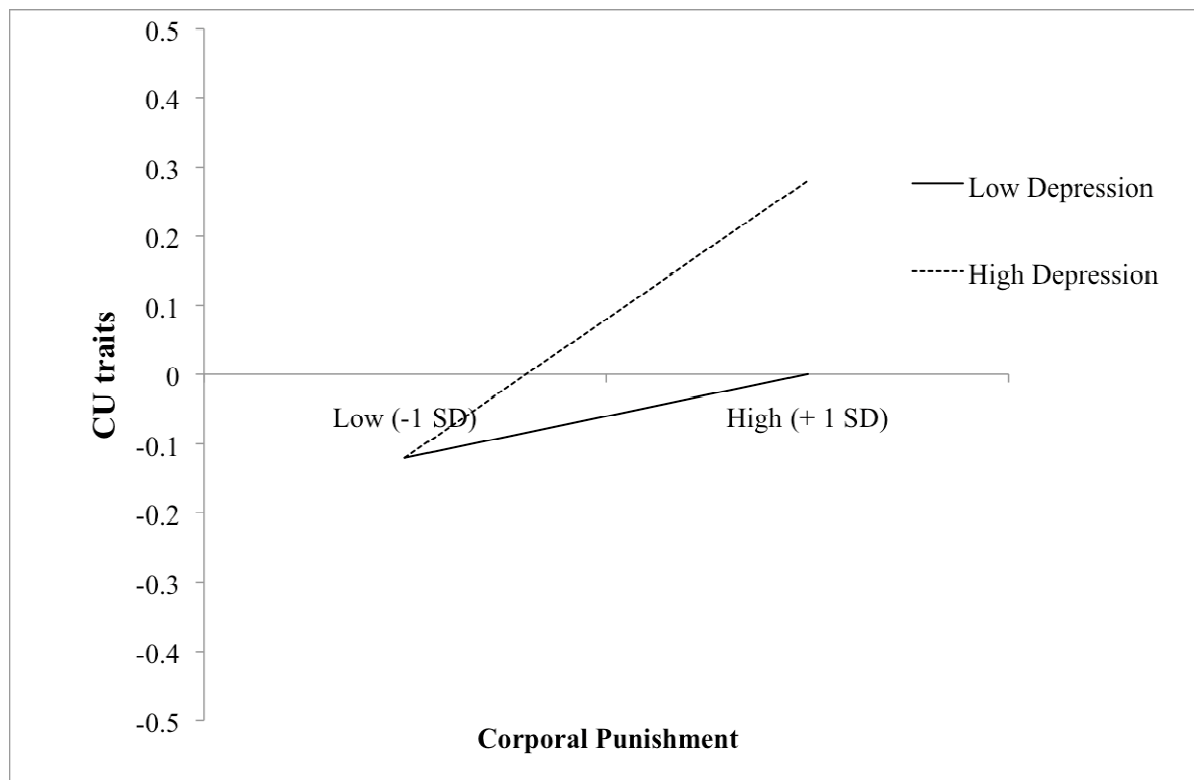


Figure 3. Parental Depression Moderates the Relation between Corporal Punishment and CU Traits

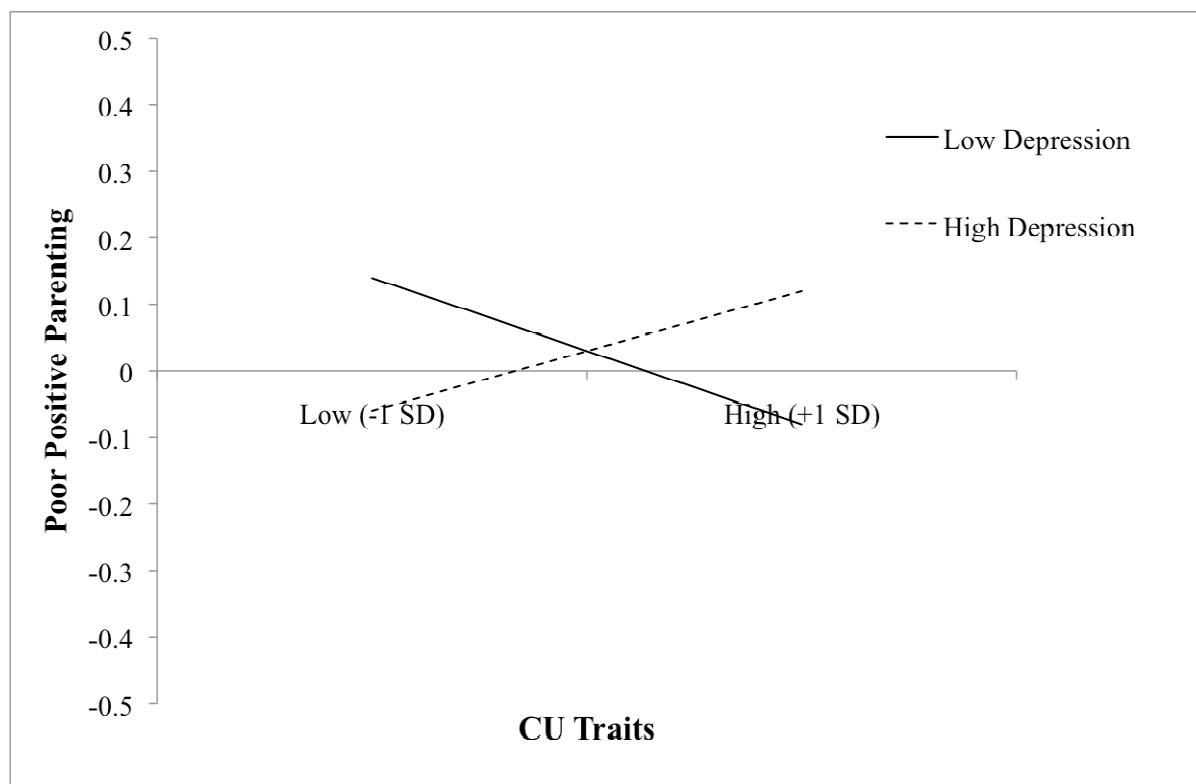


Figure 4. Parental Depression Moderates the Relation between CU Traits and Poor Positive Parenting

Vita

Amber R. Wimsatt received her B.S. in Psychology in May of 2009 from Georgia State University, Magna Cum Laude and with the Advanced Research Honors distinction. In the fall of 2009, she began my doctoral studies in Clinical Psychology at The University of Tennessee, Knoxville. In the fall of 2010, she successfully earned an M.A. in Psychology at The University of Tennessee. Currently, Amber's primary research interests surround parenting and child behaviors, specifically as they relate to child externalizing behavior and child experience of anxiety, depression, and rejection. Furthermore, she has secondary interests in diagnostics and assessment regarding child developmental delays and disorders.