

The Pennsylvania State University

The Graduate School

College of the Liberal Arts

**THE DEVELOPMENT OF ADOLESCENT CONDUCT PROBLEMS AND
BORDERLINE MOOD FEATURES AMONG CHILDREN WITH EXTERNALIZING
BEHAVIOR PROBLEMS**

A Dissertation in

Psychology

by

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 2012

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Abstract

This study examined the development of conduct problems and borderline mood features, potential precursors to antisocial and borderline personality pathologies respectively, in a sample of 317 children participating in the Fast Track project. All of these children exhibited aggressive-disruptive behavior problems at school entry, but by late adolescence, they diverged into groups characterized by elevated conduct problems, elevated mood features consistent with borderline personality pathology, or minimal elevations in conduct or mood problems. Latent class analyses revealed that overt aggression in early childhood specifically predicted conduct problems in late adolescence, whereas negative emotional reactivity in early childhood specifically predicted borderline mood features in late adolescence. Peer rejection and low parental warmth experienced in middle childhood moderated and amplified the link between early negative emotional reactivity and late borderline mood features, but these negative social experiences did not moderate the link between early overt aggression and later conduct problems. Theoretical and clinical implications are discussed.

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Acknowledgements

I feel very blessed to have had the opportunity to work on a dissertation project I loved and to do so in the company of many wonderful people.

I thank my committee members for their tremendous contributions to this project and to my growth at Penn State. I am especially grateful to Dr. Karen Bierman for her sheer brilliance, willingness to teach and support me through my academic trips and falls, and the blissful opportunity to work in her network of amazing researchers. I also thank Dr. Robert Nix for his great expertise and advice through endless iterations of analyses, Dr. Sandra Azar for her thoughtful scholarship and generosity in helping me explore where I need to go, and Dr. Kenneth Levy for his immense academic wisdom and guidance. I will try to pay it all forward.

I am also highly indebted to the Fast Track project and its participants and thank them for their generosity. In addition, I thank Dr. Brenda Heinrichs for her helpful advice.

Personal thank-yous:

I thank my parents for raising me, instilling in me important values (including love of learning), and being supportive when I took new turns in life. You are both inspirational and gifted.

I also thank my husband, Ben, for his steadfast love and support. I am very lucky to share my life with such a talented and kind individual who is just as committed as I am to working hard, giving back, and following baseball.

My friends have also been important and necessary sources of support throughout my time in graduate school. Thank you for your company and love.

Drs. Aaron Pincus, Michelle Newman, Frank Hillary, Brian Rabian, Richard Carlson, Avery Goldstein, and Jennifer Amyx: Thank you for what you said and did.

I hope that my work will carry all of your contributions forward and someday serve the next generation.

Introduction

Externalizing behavior problems in childhood are considered major risk factors for later psychopathology (Campbell, Shaw, & Gilliom, 2000; Cohen, 1996; Reef, Diamantopoulou, van Meurs, Verhulst, & van der Ende, 2010). However, there is multifinality in the trajectories of children who show externalizing behavior problems, as evidenced by existing studies that show longitudinal associations between early externalizing problems and varied types of later psychopathology (Hofstra, van der Ende, & Verhulst, 2002), including later delinquency (Broidy et al., 2003; Herrenkohl et al., 2010), antisocial personality problems (Farrington, 2000; Moffitt, Caspi, Harrington, & Milne, 2002; Rutter, 1984), externalizing problems (Bornstein, Hahn, & Haynes, 2010; Mesman & Koot, 2001), substance use problems (Reinherz, Giaconia, Hauf, Wasserman, & Paradis, 2000), internalizing problems (Copeland, Shanahan, Costello, & Angold, 2009; Moilanen, Shaw, & Maxwell, 2010; Stringaris & Goodman, 2009), and deliberate self-harm behaviors (Sourander et al., 2006).

Of particular interest is a divergence that emerges in the adolescent outcomes of children with earlier externalizing behaviors. Some of these children act out against others and exhibit hostile rule violations and interpersonal aggression in adolescence (e.g., features of conduct disorder; Diamantopoulou, Verhulst, & Van Der Ende, 2010; Farrington, 1995; Fergusson, Lynskey, & Horwood, 1996; Loeber, 1990), whereas others show elevated internalizing symptoms, such as chronic dysphoria, disturbed interpersonal relations, and aggression turned toward oneself (e.g., features of borderline personality disorder; Beauchaine, Klein, Crowell, Derbidge, & Gatzke-Kopp, 2009; Rogosch & Cicchetti, 2005). Although developmental pathways that lead to each of these different adolescent outcomes have been proposed, research

is needed to clarify how these pathways diverge among children with early externalizing problems and what pathways are specific to each outcome.

This study examines the development of adolescent conduct problems and borderline mood features in an at-risk sample of children who exhibited elevations in aggressive, oppositional, and/or disruptive behavior problems at school entry. Understanding the development of conduct problems and borderline mood problems in this sample is important because both of these outcomes are potential precursors of personality pathology that carry great costs to society and to the individual.

Persistent conduct problems are thought to be precursors of antisocial personality disorder (ASPD; J. Hill, 2003; Loeber, 1990; Moffitt, 1993), which is associated with increased and recurrent use of mental health and substance abuse treatments, violence, and contacts with the criminal justice system (Fergusson, Horwood, & Ridder, 2005; Petras et al., 2008; Werry, 1997). For instance, an estimated 31-38% of children meeting criteria for Conduct Disorder (CD) go on to meet criteria for ASPD (Crawford, Cohen, & Brook, 2001), and a study examining data from multiple prospective studies has found that 40% of children receiving a CD diagnosis between ages 7 and 17 met criteria for ASPD between ages 18 and 24 (Burke, Waldman, & Lahey, 2010). Another longitudinal study has found that CD is the only adolescent disorder that is associated with increased odds of being diagnosed with ASPD in young adulthood, with 5.4 times higher odds of being diagnosed with ASPD for those with CD diagnosis in adolescence compared to those without (Copeland et al., 2009). Thus, conduct problems in adolescence are crucial markers for future risk of antisocial personality pathology.

Persistent borderline mood features observed in adolescence, characterized by such symptoms as chronic dysphoria, parasuicidality, and labile anger, are thought to be precursors to

adulthood borderline personality disorder (BPD; Rogosch & Cicchetti, 2005), a condition associated with frequent usage of emergency services and health services for chronic medical problems (Zanarini, Frankenburg, Hennen, Reich, & Silk, 2005) and increased risk for suicidal behaviors (Yen et al., 2003). Mood features associated with borderline personality pathology, when identified in adolescence, may be considered precursors to BPD in adulthood, as research suggests that adolescence is the period when borderline personality pathology may first emerge (Lenzenweger & Castro, 2005) and is identifiable and construct-valid (Bondurant, Greenfield, & Tse, 2004; Ludolph, Westen, Misle, & Jackson, 1990; A. L. Miller, Muehlenkamp, & Jacobson, 2008).

Antisocial and borderline personality disorders, which are both classified as “dramatic, emotional, or erratic” (Cluster B) personality disorders, are thought to share childhood characteristics that contribute to their volatility and developmental risk, including impulsive, risk-taking behaviors and difficulties forming intimate close relationships (Beauchaine et al., 2009; Lyons-Ruth, 2008; Paris, 2005). However, these conditions diverge in some important ways, with one focused on harming or violating others and the other involving internalized hostility and harm to oneself. Clarification of the developmental pathways that specifically predict to antisocial pathology and to borderline pathology is crucial for effective, targeted prevention of and early intervention for these costly problems (Cicchetti & Crick, 2009; Frick & Viding, 2009; Lenzenweger & Cicchetti, 2005).

Adolescence is an especially crucial period for examining precursors of antisocial and borderline personality pathologies because personality characteristics and functioning in adolescence have been found to remain moderately stable into adulthood and predict later personality functioning (Block & Robins, 1993; Caspi, Roberts, & Shiner, 2005; Copeland et al.,

2009; Johnson et al., 2002). In addition, personality pathology measured in adolescents has been associated with a wide range of comorbid symptoms and psychosocial difficulties both concurrently and prospectively (Block & Robins, 1993; Bondurant et al., 2004; Cohen, Crawford, Johnson, & Kasen, 2005; Johnson et al., 2000; Levy et al., 1999; Roberts & DeVecchio, 2000; Shiner, 2009). Individuals who exhibit symptoms associated with personality pathology in adolescence and early adulthood generally have worse psychosocial functioning than those who have elevated symptoms only in adulthood or experience a decline in symptoms into adulthood, suggesting the importance of early intervention for those who show elevated pathology in adolescence (Skodol, Johnson, Cohen, Sneed, & Crawford, 2007).

Although numerous theoretical models have been proposed to describe the development of conduct problems and borderline mood problems, they typically examine these outcomes separately. Moreover, few empirical tests of such models exist, especially using developmental, prospective samples with data collection starting in early childhood (Campbell et al., 2000; A. L. Hill, Degnan, Calkins, & Keane, 2006). Potential reasons for the paucity of developmental studies include the fact that personality disorders are not diagnosed in childhood, the definition of personality pathology in childhood is still debated, and limited longitudinal data are currently available for examining the emergence of personality pathology (see Cicchetti & Crick, 2009; Crick, Murray-Close, & Woods, 2005; De Clercq, De Fruyt, & Widiger, 2009; Levy, 2005).

The current study sought to fill this gap by examining the emergence of conduct problems and borderline mood features in a sample of at-risk children followed prospectively from early childhood through late adolescence. The sample was recruited for the Fast Track project, a longitudinal study of children at risk for future conduct problems (Conduct Problems Prevention Research Group [CPPRG], 1992). The children in the sample were selected for

elevated aggressive, oppositional, and disruptive behaviors at school entry, and this sample was appropriate for testing a developmental model of the emergence of conduct problems and borderline mood features because it contained a high density of early behavioral problems and vulnerabilities for both antisocial and borderline pathology, as discussed below.

Based on existing theories and research on the development of conduct problems and borderline mood features, the current study posits a diathesis-stress model that takes into account differential prediction of these two adolescent outcomes. The model posits that specific early vulnerabilities and their interactions with adverse social experiences account for the divergence of developmental trajectories among children with early-starting externalizing behaviors. Specifically, it is hypothesized that different child characteristics serve as diatheses indicating increased risk for later conduct problems versus borderline mood features. Overt aggression in early childhood is hypothesized to be a key vulnerability that indicates risk for later conduct problems, whereas negative emotional reactivity in early childhood is hypothesized to be a diathesis that indicates vulnerability for later borderline mood features.

In both cases, it is hypothesized that exposure to adverse social experiences over the course of childhood amplifies the impact of these diatheses, promoting negative developmental trajectories toward adolescent maladjustment. More specifically, it is hypothesized that variations in exposure to negative interpersonal experiences (peer rejection and low parental warmth) during early to middle childhood will moderate the link between early childhood vulnerabilities and problematic adolescent outcomes. When these adverse social experiences magnify the impact of early overt aggression, the developmental trajectory may lead toward greater deviant peer affiliation, resulting in enhanced opportunities for peer-supported rule violations and hostile acting out (Dishion, Patterson, Stoolmiller, & Skinner, 1991; Dodge,

Greenberg, & Malone, 2008; Dodge & Pettit, 2003; Kupersmidt & Coie, 1990). In contrast, when adverse social experiences magnify the impact of negative emotional reactivity, the developmental trajectory may lead toward disturbed emotions (anxiety, depression, anger), interpersonal insecurity, and self-incrimination (Bradley & Westen, 2005; Carlson, Egeland, & Sroufe, 2009; Crowell, Beauchaine, & Linehan, 2009).

The diathesis-stress model will be tested using a person-centered approach, to examine how early overt aggression and negative emotional reactivity, amplified by peer rejection and low parental warmth experiences, predict adolescent conduct problems and borderline mood features differentially among children with different levels of early diatheses. In the following review, the adolescent outcomes of conduct problems and borderline mood features will be first defined and described. Then, the literature on early childhood vulnerabilities and adverse social experiences associated with these two adolescent outcomes will be reviewed to build the case for the diathesis-stress model.

Conduct Disorder and Borderline Mood Features in Adolescence

Definitions. *Conduct problems* refer to recurrent patterns of behaviors that violate age-appropriate societal norms and/or rights of others. These behaviors include aggression toward people and animals, destruction of property, deceitfulness or theft, and serious violations of rules (American Psychiatric Association, 2000). Conduct problems are considered precursors to antisocial personality problems in adulthood (Coie & Dodge, 1998; J. Hill, 2003; Moffitt, 1993) and become increasingly persistent with higher frequency, greater variety, greater number of settings, and earlier onset of conduct problems (Loeber, 1990; Moffitt, 1993). Conduct problems in childhood and adolescence have been associated with such sequelae in adulthood as criminal activity and convictions, nicotine and illicit substance dependence, mental health problems, inter-

partner violence, and lower academic and work functioning (Fergusson et al., 2005; Roisman, Aguilar, & Egeland, 2004). Conduct problems occur in higher rates among boys than girls (Baker, Jacobson, Raine, Lozano, & Bezdjian, 2007; Loeber, Burke, Lahey, Winters, & Zera, 2000; Moffitt & Caspi, 2001; Sentse, 2009), with prevalence estimated at 14% in boys compared to 4% in girls in an adolescent community sample (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003).

Borderline mood features refer to a cluster of symptoms indicative of emotional and behavioral disturbances associated with chronic affective distress and instability, including depressed mood, parasuicidality, and intense, labile anger. This construct is used to describe a chronic state of emotional dysfunction that includes depressed mood and low self-esteem, along with a tendency to experience intense episodes of anger and turn aggression towards oneself. In the present study, these features are conceptualized as potential precursors to borderline personality pathology, as they reflect some core disturbances associated with Borderline Personality Disorder (BPD), a debilitating psychiatric condition characterized by chronic affective instability, disturbances in interpersonal functioning and self-image, and impulsivity. These mood features are considered core aspects of BPD (Korner, Gerull, Mearns, & Stevenson, 2008; Skodol et al., 2002; Zanarini & Frankenburg, 2007). In particular, chronic, self-injurious behaviors (Harrington, 2001), high levels of helplessness, neediness or dependency, and self-criticism (Levy, Edell, & McGlashan, 2007; Wixom, Ludolph, & Westen, 1993), and labile, inappropriate anger (Gunderson & Phillips, 1991; Koenigsberg et al., 2002) are considered specific to borderline pathology. Among outpatient adolescents, clinician-reported difficulties controlling anger have also been reported as one of the key characteristics of adolescents who meet criteria for BPD (Bradley, Conklin, & Westen, 2005). These mood features in adolescence

have been associated with continued pathology into adulthood (Zanarini et al., 2007) and are thought to be associated with the diagnosis of BPD in adulthood (Siever, Torgersen, Gunderson, Livesley, & Kendler, 2002). Although higher rates of borderline pathology have been found in females than males in clinical samples (A. L. Miller et al., 2008), studies with community samples have found similar prevalence rates between sexes (Bernstein et al., 1993; Chabrol et al., 2004; Torgersen, Kringlen, & Cramer, 2001), with national prevalence being estimated at 5.6% among men and 6.2% among women (Grant et al., 2008).

In the next section, predictors of adolescent conduct problems and borderline mood features will be discussed. First, evidence supporting overt aggression and negative emotional reactivity as early childhood predictors of adolescent conduct problems and borderline mood features will be reviewed. Then, evidence linking peer rejection and low parental warmth to both adolescent conduct problems and borderline mood features will be reviewed, followed by a discussion of the potential moderating effects of these adverse social experiences. Finally, the hypothesized developmental model linking these early diatheses (early childhood overt aggression and negative emotional reactivity) and their interaction with adverse social experiences (childhood peer rejection and low parental warmth) differentially to later adolescent outcomes (conduct problems and borderline mood features) will be presented.

Early Childhood Behavioral Vulnerabilities

Existing theory and research suggest that conduct problems and borderline mood features have different key diatheses, or specific vulnerabilities, that are already evident in early childhood. Overt aggression in early childhood has been linked to later conduct problems, whereas negative emotional reactivity has been linked to later borderline mood features. Examining these vulnerabilities in early childhood is important because there is empirical

support for the link between early behavioral characteristics and later personality functioning (Caspi & Silva, 1995; Clark, 2005), with stability of these characteristics generally increasing with age (Roberts & DelVecchio, 2000). Below, existing research linking these early vulnerabilities to their respective adolescent outcomes is discussed.

Overt aggression. Overt aggression is a form of aggression that entails harming others through physical damage or threatening others to do so (see Crick, 1996; Crick, Casas, & Mosher, 1997). Examples of overt aggression include cruelty, bullying, or meanness to others, physically attacking people, and threatening people. Overt aggression is openly confrontational in nature (Connor, Melloni, & Harrison, 1998) and emerges after toddlerhood (Loeber, 1990; Loeber & Hay, 1997). Normatively, overt aggression decreases during early childhood from a peak during the toddler years (ages 2-3) to relatively low levels by age 7 (Coie & Dodge, 1998). Children who fail to show this normative decrease, and who continue to show high levels of overt aggression at school entry, are at risk of ongoing aggression and related behavioral problems (Coie & Dodge, 1998).

The link between overt aggression in childhood and later conduct problems in adolescence is widely supported (Coie & Dodge, 1998; Kupersmidt & Coie, 1990; Loeber, 1990; Miller-Johnson, Coie, Maumary-Gremaud, Lochman, & Terry, 1999; Parker & Asher, 1987). Moreover, there is evidence suggesting that elevated overt aggression in early childhood is one of the most powerful risk indicators for later conduct problems. For instance, teacher-rated aggressive behavior in early childhood (elementary school) years has been found to be one of the strongest predictors of adolescent conduct problems, especially for boys (Lewin, Davis, & Hops, 1999), predicting self-reported delinquency, physical violence, and contacts with the juvenile justice system (Nagin & Tremblay, 1999). Peer-rated aggressiveness in third grade has also been

found to predict serious criminal activity in sixth, eighth, and/or tenth grades (Miller-Johnson et al., 1999). In addition, in a multi-site investigation of longitudinal studies following the development of conduct problems among children in community samples, Broidy and colleagues (2003) found significant links between early physical aggression and later violent as well as non-violent delinquency, especially in boys.

Children who exhibit high rates of overt aggression in early childhood generally show more sustained and serious forms of aggression later in life than children without early histories of overt aggression. Significant rank-order stability of aggression has been found, such that children with the highest levels of overt aggression also maintain the highest levels of aggression and offending throughout childhood and adolescence (Broidy et al., 2003; Loeber & Hay, 1997; Nagin & Tremblay, 1999; Reef et al., 2010). It is possible that overt aggression reflects underlying behavioral and biological vulnerabilities, such as undercontrolled, disinhibited, irritable/difficult, oppositional, and/or fearless temperament, which may be expressed as aggression in early childhood and pose risk for future conduct problems (Caspi, 2000; Caspi, Henry, McGee, Moffitt, & Silva, 1995; Clark, 2005; Farrington, 2005; Kasen, Cohen, Brook, & Hartmark, 1996; Lahey, Waldman, & McBurnett, 1999; Loeber & Hay, 1997; Raine, 2002). Moreover, studies on genetic and environmental contributors to antisocial behavior have found that aggression is a potential expression of a heritable vulnerability for antisocial behaviors (Baker et al., 2007; Lahey et al., 1999) and that aggression and violent antisocial behavior share a common genetic source (Eley, Lichtenstein, & Moffitt, 2003). These findings suggest that early overt aggression may be a powerful predictor of, and behavioral diathesis for, conduct problems in adolescence.

Negative emotional reactivity. Negative emotional reactivity refers to the speed and intensity with which a child responds with negative affect in response to stimuli. A child with high negative emotional reactivity will show heightened emotional sensitivity to stimuli and a tendency to respond to them with negative mood (see Scaramella & Leve, 2004). Negative emotional reactivity and difficulties regulating negative affect have been theorized to be key contributors to the development of later borderline pathology (Bradley & Westen, 2005; Cole, Llera, & Pemberton, 2009; Crick et al., 2005; Gratz et al., 2009; Judd & McGlashan, 2003; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Putnam & Silk, 2005; Siever & Davis, 1991). Studies have found links between borderline personality pathology and difficulties regulating and processing emotions that may manifest as negative emotional reactivity, including bias towards experiencing intense negative affect (Gollan, Lee, & Coccaro, 2005; Levine, Marziali, & Hood, 1997; Putnam & Silk, 2005; Rogosch & Cicchetti, 2005) and difficulty modulating affective responses (Putnam & Silk, 2005; Sanislow et al., 2002). Moreover, cross-sectional associations between negative emotional reactivity and borderline personality pathology have been found (Cole et al., 2009; Conklin, Bradley, & Westen, 2006; Fruzzetti, Shenk, & Hoffman, 2005; Gratz, 2006; Rogosch & Cicchetti, 2005).

Moreover, negative emotional reactivity in terms of the tendency to exhibit intense, inappropriate affect has been proposed as an early developmental symptom of borderline pathology in early childhood (Beauchaine et al., 2009; Crick et al., 2005; Rogosch & Cicchetti, 2005). Developmental models linking negative emotional reactivity in early childhood to the development of borderline pathology have not yet been widely tested empirically (Crowell et al., 2009; Gratz, 2006), but the few studies that exist provide support for the argument that early negative emotional reactivity may be an important indicator of risk for future borderline

personality pathology. For instance, maternal report of child temperamental characteristics related to negative emotional reactivity (e.g., moodiness, frequency of crying, complaining, temper tantrums) in ages 4 to 10 predicted symptoms of borderline personality disorder in adolescence and adulthood within a community sample (Crawford, Cohen, Chen, Anglin, & Ehrensaft, 2009). This study found that angry temperament in childhood was a significant, unique predictor of BPD symptoms even after taking into account other risk factors such as early separation from mother, crying/demanding temperament in childhood, maltreatment, and adolescent attachment. Carlson et al. (2009) found that, in a community sample of families living in poverty, negative emotionality assessed at 30 months was significantly correlated with BPD symptoms at age 28.

There are also studies linking negative emotional reactivity to symptoms related to adolescent borderline mood pathology. For instance, within a sample of children recruited from primary schools in an urban area, self-reported negative emotionality assessed between ages 10-13 significantly predicted depressive symptoms in adolescence (Yap et al., 2011). Moreover, within a longitudinal birth cohort study, observer-reported dysregulated negative affect characterizing “undercontrolled” children (e.g., irritability, mood lability) in early- to mid-childhood (ages 3 to 9) predicted later self-reported alienation on the Multidimensional Personality Questionnaire at age 18, which is a symptom consistent with interpersonal disturbances found in borderline pathology (Caspi & Silva, 1995). Thus, although longitudinal studies examining the link between negative emotional reactivity and adolescent borderline mood features are rare, existing studies have provided some evidence that negative emotional reactivity or associated emotion regulation difficulties in early childhood may predict adolescent mood features and symptoms consistent with borderline personality problems.

In sum, existing longitudinal studies suggest that elevations in overt aggression during early childhood gives rise to a pattern of hostile and antisocial behaviors that characterize conduct problems in adolescence, whereas elevations in negative emotional reactivity gives rise to a pattern of affective dysregulation reflecting key features of borderline pathology in adolescence. Early childhood problems associated with overt aggression and negative emotional reactivity may co-occur or may be quite distinct among children with externalizing problems and selected for being at high risk for conduct disorder, such as those recruited for the Fast Track project.

Models of conduct disorder typically recognize heterogeneity in the emotional functioning of children who exhibit early behavioral problems. For instance, a significant subgroup of children at risk for conduct problems show blunted, rather than hyper-reactive, emotionality. This tendency to be hypo-aroused in response to stressors is hypothesized to underlie the sensation-seeking behavior and insensitivity to punishment, along with callous-unemotional traits, that are sometimes associated with conduct problems (Dadds & Salmon, 2003; Dandreaux & Frick, 2009; Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011; Frick & Ellis, 1999; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Frick & White, 2008; Raine, 2002; Susman, 2006). However, for other children, negative emotional reactivity may coincide with early oppositional and aggressive responding. For example, negative emotionality is thought to underlie the high levels of oppositional behavior and irritability often associated with externalizing behavior problems, and it may fuel impulsive and reactive aggressive responding (Weinshenker & Siegel, 2002). Neurobiological deficits associated with emotional dysregulation and difficulties inhibiting aggression, which may underlie conduct problems, may co-occur in children with early externalizing problems (Cappadocia, Desrocher, Pepler, & Schroeder, 2009).

Moreover, failure to develop effective emotion regulation capacities have been linked to increased risk for conduct disorder as well (Caspi et al., 1995; Cole, Teti, & Zahn-Waxler, 2003; Zahn-Waxler, Shirtcliff, & Marceau, 2008). Hence, children with early externalizing problems may exhibit varying degrees of overt aggression and negative emotional reactivity, with some showing one of these early vulnerabilities primarily and others showing elevated levels of both.

Early Childhood Vulnerabilities and Adverse Social Experiences

Overt aggression and negative emotional reactivity have been proposed as early childhood diatheses that increase risk for conduct problems and borderline mood features in adolescence. However, many children who show these early vulnerabilities will develop adequate self-regulation skills and achieve social integration over time, growing out of their early risk status without experiencing adolescent maladjustment (Coie & Dodge, 1998; Nagin & Tremblay, 1999; Reef, Diamantopoulou, Van Meurs, Verhulst, & Van Der Ende, 2009). Sustained maladjustment is more likely when children encounter additional risk factors in childhood, often as a consequence of earlier risks (Dodge et al., 2008; Dodge et al., 2009). That is, the early childhood vulnerabilities of overt aggression and negative emotionality may not only contribute directly to maladjustment in adolescence, but they may also make indirect contributions to maladjustment by increasing adverse social experiences in childhood that further exacerbate a child's risk. Longitudinal evidence suggests that peer rejection and low parental warmth represent such experiences.

There are numerous studies linking overt aggression and negative emotional reactivity to social difficulties with peers and parents. For example, in preschool, teacher-rated aggression has been associated with peer-reported rejection (Olson, 1992; Wood, Cowan, & Baker, 2002). Moreover, observer-rated aggressive behaviors, in particular those that were instrumental in

nature, have been linked to peer-rated rejection among boys in first and third grades (Coie, Dodge, Terry, & Wright, 1991). A longitudinal link between peer and/or teacher-rated overt aggression and later peer-rated rejection within the same school year has been also found across elementary school years (Crick, 1996; Rose, Swenson, & Waller, 2004). Additionally, studies of parent-child interactions show that elementary school-aged children with conduct problems, including aggression, incur significantly more negative responses from parents than do children without conduct problems (Anderson, Lytton, & Romney, 1986) and that parents of physically aggressive boys report lower levels of pleasure experienced in the parent-child relationship (Haapasalo & Tremblay, 1994). Moreover, aggressive and externalizing behavioral problems have been found to increase risk of hostile or coercive responding by the parent, thus parenting characterized by low warmth, as repeated aversive interactions serve to reinforce hostile responses within the parent-child dyad (Granic & Patterson, 2006).

Negative emotional reactivity has also been associated with lowered social competence and increased risk of interpersonal rejection (for review, see Eisenberg, Fabes, Guthrie, & Reiser, 2000; Fabes et al., 1999). For instance, negative emotional reactivity operationalized as teacher-reported emotional negativity/lability and dysregulation predicted peer-reported victimization in one study (Schwartz, 2000) and low levels of teacher-reported social competence in another (Eisenberg et al., 1995), both indicating problematic peer relations. Volatile and/or disruptive behaviors involving dysregulated, reactive responding increase the risk for peer rejection in grade school (Bierman, 2004; Pope, Bierman, & Mumma, 1989). Furthermore, children who exhibit a combination of aggression and dysregulation (e.g., unpredictable and reactive responding), reflecting negative emotional reactivity, are more likely to be rejected by their peers than children with similar levels of aggression who are not emotionally reactive or dysregulated

(Bierman, Smoot, & Aumiller, 1993; Pope & Bierman, 1999). This suggests that negative emotional reactivity may play a critical role in increasing the risk of rejection.

Moreover, children with high negative emotional reactivity are often irritable, difficult to parent, and easily distressed, which may evoke responses from parents that are hostile, coercive, neglectful, or detached (Belsky, 1984; Boivin et al., 2005; Campbell et al., 2000; W. A. Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Lengua, 2006; Scaramella & Conger, 2003). Indeed, studies have revealed links between child negative emotionality and parental overcontrol and hostility (Boivin et al., 2005; Clark, Kochanska, & Ready, 2000; Vitaro, Barker, Boivin, Brendgen, & Tremblay, 2006). These effects may reflect the strain that child negative emotional reactivity can place on parents, as well as conversely, the impact of distant, non-supportive, and harsh parenting on the development of child emotion regulation skills.

Thus, children with early childhood vulnerabilities of overt aggression and/or negative emotional reactivity are at higher risk for experiencing adverse social experiences with peers and parents in childhood than children who enter school without elevated aggression and with better emotion regulation skills. The impact of the early childhood vulnerabilities may be magnified through these adverse social experiences, as they limit the opportunities available for the child to develop and improve on emotion regulation and prosocial capacities that are necessary for effective interpersonal functioning (Calkins & Keane, 2009; Eisenberg, 2000; Fruzzetti et al., 2005; Oland & Shaw, 2005; Rubin, Bukowski, & Parker, 1998) and desist from their problematic trajectories. In the following section, peer rejection and low parental warmth will be discussed as potential moderators and psychosocial stressors that magnify the impact of early childhood vulnerabilities and contribute to conduct problems or borderline mood features in adolescence.

Adverse social experiences and their links to adolescent outcomes.

Peer rejection. Peer rejection is defined as an experience of being unaccepted and disliked by peers (for a discussion of definitional issues, see Bierman, 2004). There is considerable evidence suggesting that peer rejection contributes to maladaptive outcomes (Ladd, 1999), including internalizing and externalizing problems (Coie, Lochman, Terry, & Hyman, 1992; Parker, Rubin, Price, & DeRosier, 2006; Sentse, 2009). Even among children with elevated aggression, peer rejection increases risk for later externalizing problems independently of aggression (Coie, Terry, Lenox, & Lochman, 1995; Ladd, 1999; Miller-Johnson, Coie, Maumary-Gremaud, Bierman, & CPPRG, 2002). Longitudinal studies and observations of short-term experimental playgroup interactions suggest that child characteristics and behaviors typically precede and elicit peer rejection, and exposure to the rejection then evokes more aggressive responding (Bierman, 1987; Patterson, DeBaryshe, & Ramsey, 1989). This means that, as hypothesized in the study, peer rejection is likely a consequence rather than an antecedent of early childhood aggressive behaviors, with peer rejection moderating the direct effects of early behavioral problems on later maladjustment.

Moreover, existing research suggests that peer rejection may be a non-specific risk factor for both conduct problems and borderline mood features. Numerous studies have found links between peer rejection experienced in childhood and adolescent conduct problems (Calkins & Keane, 2009). For instance, among boys, peer rejection experienced during elementary school years predicted self-reported antisocial behaviors in adolescence (Lewin et al., 1999). Furthermore, children rejected by peers in late elementary school experienced significantly greater rates of truancy and police contact in adolescence compared to non-rejected children (Kupersmidt & Coie, 1990). Similarly, higher teacher-rated peer rejection at age nine predicted

elevated levels of self-reported conduct problems at age 18 (Woodward & Fergusson, 1999), and peer-rated rejection in fourth grade predicted heightened conduct problems (according to self-report and teacher-ratings) as well as court offenses in ninth grade (Ollendick, Weist, Borden, & Greene, 1992). Peer rejection in third grade predicted minor theft and felony assault in boys and minor assault in girls during grades 6, 8, and 10 in another study as well (Miller-Johnson et al., 1999). Peer rejection in childhood has been thought to be linked to adolescent violent antisocial behaviors through involvement with deviant peers and gangs, leading to processes of peer contagion and deviancy training in which children are exposed to peer models and contingent responding that escalate antisocial behaviors and lead to violent offenses in adolescence (Dishion, Véronneau, & Myers, 2010). The impact of peer rejection experiences appear to be cumulative, as peer rejection occurring during more than one grade in early elementary school is associated with much higher probability (50%) of developing later conduct disorder than when peer rejection is absent (9%) (Dodge & Pettit, 2003).

However, peer rejection has also been linked to internalizing problems associated with borderline mood features. For instance, exposure to peer rejection is linked to increasing internalizing problems and loneliness in middle childhood (Boivin, Hymel, & Burkowski, 1995) and in adolescence (Coie et al., 1995; Kiesner, 2002). Multiple studies have shown a prospective relationship between rejection and difficulties consistent with borderline mood features. For instance, in a prospective longitudinal study, rejection (as reported by the child, teacher, and mother) at grade six predicted depressive symptoms in the subsequent two years (Nolan, Flynn, & Garber, 2003). Teacher-rated peer rejection at age nine has also emerged as a predictor of suicide attempts at age 18 (Woodward & Fergusson, 1999). For girls in middle childhood, low peer acceptance has been linked to depression and general relationship difficulties (Kupersmidt

& Patterson, 1991), whereas Burks and colleagues (1995) found that boys who were chronically rejected by peers in early grade school had the highest internalizing symptoms compared to boys who were temporarily or not at all rejected. In addition, a concurrent relationship between perceived peer rejection and suicidal ideation has been found among adolescent inpatients hospitalized for risk of suicidality (Prinstein, Boergers, Spirito, Little, & Grapentine, 2000). Thus, peer rejection in childhood has been linked to both conduct and mood problems in adolescence.

Low parental warmth. In addition to peer rejection, low parental warmth is another adverse social experience that may be a non-specific predictor of both types of adolescent problems. Low parental warmth, borrowing the description of parental warmth by Maccoby (1980), is characterized by low levels of: a.) commitment to child welfare, b.) responsiveness to child needs, c.) willingness to spend time engaging in activities chosen by the child, d.) display of enthusiasm over the child's accomplishments and altruistic behavior, and e.) sensitivity to the child's emotional states (p. 392). Low parental warmth may be expressed through cold and unaffectionate, hostile and aggressive, or indifferent and neglecting behaviors towards child by the parent (Rohner, Khaleque, & Cournoyer, 2005). Because warmth is considered a dimension of parenting that is highly influential on the child's psychosocial development (Maccoby & Martin, 1983), low parental warmth can be expected to pose non-specific risk for maladjustment, including later conduct problems and borderline mood features. Parenting that is characterized by low warmth has been linked to poor psychosocial adjustment in adolescence, including externalizing and internalizing problems (Akse, Hale, Engels, Raaijmakers, & Meeus, 2004; Hale, Van Der Valk, Engels, & Meeus, 2005; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Sentse, 2009).

Existing research suggests that low parental warmth may contribute to the development of conduct problems in adolescence. Low parental warmth has been associated with risk factors for conduct problems, including early aggression (McFadyen-Ketchum, Bates, Dodge, & Pettit, 1996) and externalizing problems (McKee, Colletti, Rakow, Jones, & Forehand, 2008) and has been found to predict adolescent delinquency (Simons, Robertson, & Downs, 1988). Moreover, low parental warmth represents an absence of the protective and nurturing effects of warm parenting that mitigate externalizing problems (Dodge & Pettit, 2003; Pettit, Bates, & Dodge, 1997; Sentse, 2009) and, in boys, increase acceptance by peers (Davidov & Grusec, 2006). The pattern of harsh and coercive parenting that has been linked with the escalation of child conduct problems is often accompanied by parental withdrawal from the parent-child relationship and corresponding decreases in parental warmth and involvement (Granic & Patterson, 2006; Patterson & Bank, 1989), which may increase child's risk of social adjustment difficulties (Maccoby, 1980) as well as future violence (Dodge et al., 2008). Parental rejection has also been linked to the development of conduct disorder (Farrington, 1995; Loeber, 1990), and a meta-analysis of family predictors of juvenile conduct problems also found a strong link between parental rejection characterized by lack of positive, supportive parenting and the child's later conduct problems (Loeber & Stouthamer-Loeber, 1986).

Low parental warmth is also consistent with aspects of parenting that are thought to pose risk for the development of borderline pathology, for instance invalidation and emotional uninvolved (Fruzzetti et al., 2005; Linehan, 1993), absence of affectively warm and sensitive responding that assist in the development of emotion regulation (Eisenberg et al., 2010; Maccoby, 1980) and secure attachment (Calkins, 2004), and provision of support in the parent-child interaction (Parke & Buriel, 1998). Empirical studies linking low parental warmth and the

development of borderline pathology are rare, but studies suggest that low parental warmth increases risk for problems associated with borderline pathology. Such problems include externalizing problems (Feinberg, Button, Neiderhiser, Reiss, & Hetherington, 2007; N. B. Miller, Cowan, Cowan, Hetherington, & Clingempeel, 1993), internalizing problems (Berg-Nielsen, Vikan, & Dahl, 2002; Kim et al., 2003), co-occurrence of externalizing and internalizing problems (Ge, Best, Conger, & Simons, 1996; Kim et al., 2003; Oland & Shaw, 2005), and interpersonal problems characterized by negative attribution style, lack of active coping, low self-efficacy, and aggression (e.g., Muris, Schmidt, Lambrichs, & Meesters, 2001; Simons & Robertson, 1989). In addition, perceived parental hostility and rejection, which may reflect low parental warmth, have been linked to depressive symptoms and aggression in adolescence (Akse et al., 2004; Hale et al., 2005), and familial hostility in general has been linked to comorbid conduct disorder and major depression (Simic & Fombonne, 2001). Furthermore, withdrawn maternal behaviors, such as failure to initiate interaction or not greeting the infant after a separation, were more predictive of the child's borderline symptoms in late adolescence than maternal negative-intrusive behaviors in the child's infancy (Lyons-Ruth, 2006, 2008).

Adverse social experiences as developmental moderators. As studies have shown, peer rejection and low parental warmth have both been linked to increased risk of conduct problems and borderline mood features, and they can be considered non-specific risk factors for both types of maladaptive adolescent outcomes. A remaining question, however, is why these adverse social experiences appear to have differential impact on children, promoting conduct problems for some, but emotional distress and volatility for others. A key hypothesis of the current study

is that the impact of these negative social experiences in childhood on later outcomes depends upon the early childhood vulnerabilities of the affected children.

Previous studies have found support for the possibility that early vulnerabilities shape the impact of social problems on later outcomes. For example, peer rejection during preadolescence contributed to increases in depressive symptoms between ages 11 and 14, but only for girls with high emotional reactivity at age six or seven (Brendgen, Wanner, Morin, & Vitaro, 2005). In another developmental study of a Dutch birth cohort, Sentse (2009) found that parenting and peer experiences moderated the degree to which temperamental tendencies to be fearful during preschool predicted internalizing problems in adolescence and tendencies to be easily frustrated during preschool predicted externalizing problems in adolescence, with protective effect found for parental warmth and a risk-promoting effect found for peer rejection. These examples point to the ways in which adverse socialization experiences can moderate and magnify the extent to which an early vulnerability predicts later outcomes that are specific to that vulnerability.

Amplification of the effects of overt aggression on later conduct problems.

Developmental models of early-starting and chronic conduct problems emphasize the role of interpersonal experiences and instrumental learning in the developmental trajectory associated with antisocial outcomes. In these models, active and impulsive young children evoke control attempts. Parents who are young, single, or stressed often over-react, attempting to gain child compliance with harsh, over-controlling, and inconsistent discipline (Patterson, 1986). When young children are able to “escape” parental demands with the use of aggressive or oppositional behaviors, their aggressive and oppositional behavior is reinforced and escalates (Dishion, 1990; Dishion et al., 1991; Farrington, 1995; Patterson et al., 1989). Termed coercive family processes, aggressive parent-child interactions may escalate, undermining positive socialization

and reinforcing angry reactivity as a control and conflict management strategy (Campbell, Spieker, Vandergrift, Belsky, & Burchinal, 2010; Granic & Patterson, 2006; Snyder, Schrepferman, & St. Peter, 1997). Repeated conflicts and difficulties managing the angry and oppositional child may promote increasingly inflexible and negative social information processing patterns in the parent (e.g., hostile intent attributions, low self-efficacy), which may in turn maintain coercive transactions as well as decrease opportunities for positive engagement and modeling of flexible and prosocial responses (Azar, Nix, & Makin-Byrd, 2005). Accordingly, the child's development of self-regulation and interpersonal problem-solving skills is delayed.

Angry and oppositional children who have experienced coercive transactions with their parents may thus enter school with a limited repertoire of socially skillful behaviors and elevated aggression, and they are often rejected by peers (Coie et al., 1991; Crick, 1996; Olson, 1992; Rose et al., 2004; Wood et al., 2002). Peer rejection, in turn, increases the likelihood of peer socialization experiences that support ongoing aggression (Coie, 1990). For example, faced with exclusion and dislike by mainstream peers, rejected aggressive children are more likely to develop hostile expectations and attributions regarding others, which increase the likelihood and provide justification for interpersonal aggression (Dodge et al., 2003; Rubin et al., 1998). In addition, given limited social opportunities, these children affiliate with other aggressive-rejected children, experiencing play partners who are delayed in prosocial skill development but "skillful" in deviant and antisocial behaviors (Dishion, Andrews, & Crosby, 1995; Dishion et al., 1991; Dishion et al., 2010; Patterson et al., 1989). Variouslly labeled "peer contagion" or "deviancy training," partnerships among aggressive boys often involve high rates of inappropriate, antisocial, and risk-taking behavior that is reciprocally modeled and reinforced with attention, imitation, and laughter, thereby increasing deviant behaviors (Calkins & Keane,

2009; Campbell et al., 2000; Dishion et al., 1991; Dodge et al., 2008; Dodge & Pettit, 2003; Kupersmidt & Coie, 1990; Ladd, 1999; Laird, Jordan, Dodge, Pettit, & Bates, 2001; Oland & Shaw, 2005). In this way, peer rejection may increase the stability of early aggression and its association with adolescent antisocial outcomes by narrowing alternative social opportunities and increasing risk for antisocial peer affiliation.

In addition, coercive family processes are associated with the gradual deterioration of parent-child relationship quality and positive parental socialization efforts. Hostile and coercive transactions within the parent-child relationship promote aggression directly, and in addition, are often painful and punitive for parents and children alike. Over time, parents often withdraw from their investment in relationships with aggressive children, showing lowered levels of warmth, affection, and involvement (Patterson & Bank, 1989). Whereas sensitive, responsive, warm, and involved parenting fosters the development of moral reasoning and prosocial orientation (Eisenberg, 2000; Fabes et al., 1994), parents who withdraw emotionally from their children and offer little affection or warmth contribute less to the positive socialization of child self-regulation, social skills, empathy, or perspective-taking (Davidov & Grusec, 2006; Eisenberg, Cumberland, & Spinrad, 1998; Zahn-Waxler & Radke-Yarrow, 1990). Moreover, the detached parent may fail to provide the monitoring, limit-setting, and creation of positive social opportunities that are necessary to protect the youth from deviant peer affiliations and opportunities for antisocial activities (Ladd & Le Sieur, 1995; Saarni, 1999). Thus, low parental warmth may emerge from and escalate with chronic aggressive behavioral problems of the child while also failing to curtail, and even promoting, social and emotional skill deficits that may maintain child aggression. As such, low parental warmth and its association with parental detachment and low monitoring may increase the likelihood of stable child aggression and

emerging antisocial activity in children with propensity for and early exhibition of aggressive behavior.

Amplification of the effects of negative emotional reactivity on later borderline mood features. Although negative emotional reactivity is often associated with aggressive behavior in early childhood, theoretically, these two aspects of child functioning are quite distinct. Conceptually, negative emotional reactivity reflects a temperamental characteristic that is biologically based (Rothbart, 1989; Rothbart & Bates, 2006). Based upon constitution and early experiences, children with high emotional reactivity respond to perceived threats and stressors with high intensity and a slow recovery. Thus, a child with high negative emotional reactivity will show heightened emotional sensitivity to stimuli and a tendency to respond to them with negative mood, as well as a tendency to remain disturbed by a perceived threat for a longer period of time (see Scaramella & Leve, 2004). Some theorists have suggested that children with high levels of negative emotional reactivity are more strongly affected by the quality of their social environment than less reactive children (differential susceptibility; Belsky & Pluess, 2009; Ellis, Boyce, Belsky, Bakermans-Kranenburg, & van Ijzendoorn, 2011), suggesting that adverse social experiences may interact with and enhance the risk posed by negative emotional reactivity. Low parental warmth and peer rejection represent indices of low interpersonal support that might function as important stressors amplifying emotional dysregulation for children with vulnerable, reactive temperaments.

Specifically, children with elevations in negative emotional reactivity are at an increased risk of deficiencies in social competence (Eisenberg et al., 1995), interpersonal rejection (Eisenberg et al., 2000; Fabes et al., 1999), and peer victimization (Schwartz, 2000). Moreover, children from the Fast Track project who have elevations in negative emotional reactivity fit the

profile of a group of children who may show a combination of dysregulated, aggressive, and oppositional behaviors associated with highest risk for peer rejection, continued disruptive behavior problems, and later antisocial behavioral problems (Bierman, 2004; Bierman et al., 1993; Pope & Bierman, 1999).

Children with high negative emotional reactivity, when rejected by peers, may find the experience particularly distressing and become further dysregulated by the rejection experiences, which may limit opportunities for developing emotion regulation and prosocial skills that are crucial for effective interpersonal functioning (Calkins & Keane, 2009; Fruzzetti et al., 2005). These children may also develop increasingly negative senses of self and others (Ladd & Troop-Gordon, 2003) and more intense expectations of and sensitivity to future rejection (Sandstrom, Cillessen, & Eisenhower, 2003). It is also possible that peer rejection also magnifies the interpersonal disturbances underlying the child's negative emotional reactivity, possibly as a result of disturbances within the parent-child relationship earlier in life (Calkins, 2004; Carlson et al., 2009; Eisenberg et al., 1998; Keenan, 2000; Morris, Silk, Steinberg, Myers, & Robinson, 2007; Shields, Ryan, & Cicchetti, 2001). Thus, experiences of peer rejection may intensify emotional dysregulation and interpersonal disturbances in children with high negative emotional reactivity, increasing risk for maladjustment consistent with borderline pathology.

Low parental warmth in middle childhood may likewise magnify the risk of later borderline mood features among children with high levels of negative emotional reactivity. Parents who are detached and low in warmth may fail to provide adequate emotion-oriented socialization, helping the child learn to accurately perceive, interpret, and respond to his or her physiological arousal (Parke & Buriel, 1998; Saarni, Mumme, & Campos, 1998). Absence of such emotional support and coaching may exacerbate the child's difficulties with emotion

regulation, promoting dysregulation combined with lack of access to parental reinforcement, coaching, and structuring of emotional experiences that are necessary for effective emotional regulation and responding (Cole, Michel, & Teti, 1994). By the same token, parents who exhibit low warmth may also exacerbate the child's risk by reinforcing the suppression of emotional expression at normative intensity and the demonstration of emotions at high intensity, which draws parental attention to the child (Crowell et al., 2009). Experiences of parenting characterized by low warmth may thus contribute to more chronic emotional dysregulation found in borderline personality pathology, including emotional instability, poor emotional awareness (Cole et al., 2009), high sensitivity and reactivity (Fruzzetti et al., 2005), and difficulty developing associations between affect and cognition that permit appropriate responses to stimuli (Cicchetti, Ackerman, & Izard, 1995). Children with high negative emotional reactivity may also be at increased risk for responding to low parental warmth with decreased self-esteem and direction of their anger inward (Rohner, 2004), which reflect mood problems consistent with borderline pathology (Carlson et al., 2009).

A combination of child negative emotional reactivity and low parental warmth may also amplify the impact of underlying interpersonal, for instance attachment, disturbances that increase the risk for borderline personality pathology. Chronically low parental warmth in the presence of child negative emotional reactivity may be associated with difficulties developing stable, coherent, and secure interpersonal representations, especially in the context of shifting, contradictory "hostile/helpless" (Lyons-Ruth & Spielman, 2004) or "frightened/frightening" (Hesse & Main, 2006) states by the parent. In such a context, low parental warmth may lead to emotionally dysregulated and disorganized responses by the child (Sroufe, Carlson, Levy, & Egeland, 1999) and difficulties developing a sense of coherent and positive representations of

self and others, increasing risk for borderline personality pathology (Carlson et al., 2009; Fonagy, Target, & Gergely, 2000; Levy, 2005). Moreover, parenting characterized by low warmth may instill in the child an internal working model of interpersonal relations that is characterized by insecurity, mistrust, and anger (Greenberg, Speltz, & DeKlyen, 1993) and replicated in later interpersonal relations (W. A. Collins, Harris, & Susman, 1995; Ladd, 1999; Sroufe et al., 1999).

In summary, adverse social experiences of peer rejection and low parental warmth in childhood are thought to confer risk for different types of adolescent maladjustment, depending on the early childhood vulnerabilities or diatheses that are present. Specifically, children with early overt aggression are likely to experience increased risk of developing conduct problems in the presence of adverse social experiences, whereas those with early negative emotional reactivity are likely to experience increased risk of developing borderline mood features and borderline personality pathology in the presence of adverse social experiences. The present study sought to test these diathesis-stress effects simultaneously in a sample of children with early externalizing behavioral problems.

Potential Sex Differences. In addition, the present study examined whether the hypothesized models would differ by sex. Examining sex differences may be important because conduct problems and borderline mood pathology have been thought to occur at different rates in boys and girls. As mentioned above, higher rates of physical aggression and conduct problems have been found in boys compared to girls (Baker et al., 2007; Bierman, 2004; Loeber et al., 2000; Moffitt & Caspi, 2001; Sentse, 2009), whereas higher rates of internalizing problems (Kasen, Cohen, Skodol, Johnson, & Brook, 1999) and borderline pathology (Bradley et al., 2005; Edens, Marcus, & Ruiz, 2008; Gross et al., 2002; Sanislow et al., 2009) have been found in

females compared to males, especially in clinical samples (A. L. Miller et al., 2008). However, studies with community samples have found similar prevalence rates of borderline pathology across sexes for both adolescents (Bernstein et al., 1993; Chabrol et al., 2004). Potential differences in prevalence rates suggest that it would be important to examine whether profiles of distress consistent with conduct problems and borderline mood features in adolescence occur in both boys and girls.

Moreover, there is mixed evidence regarding whether similar trajectories of conduct problems exist in both sexes. One longitudinal study has found comparable trajectories for boys and girls, albeit at different rates of occurrence (Moffitt & Caspi, 2001). However, other studies have found slightly different trajectories, for instance finding that there is greater stability in rule-breaking and externalizing behaviors across childhood among boys compared to girls (Pope & Bierman, 1999) and that boys with moderate levels of aggressive-disruptive disorders at first grade increase their problem behaviors over time at a greater rate compared to girls with comparable initial levels of aggressive-disruptive problems (Schaeffer et al., 2006). Moreover, a few investigators have postulated that child-onset “early starting” patterns of chronic conduct disorder are very rare among girls but more common among boys, with girls more likely to show delayed-onset or “adolescent limited” patterns of conduct problems than early onset (Moffitt & Caspi, 2001; Silverthorn & Frick, 1999). Accordingly, these investigators suggest that trajectories of conduct problems may more often increase among girls after age 15, whereas boys’ trajectories are consistent across childhood into adolescence (Odgers et al., 2008). These studies suggest that it would also be important to examine whether early childhood vulnerabilities lead to adolescent outcomes in similar manners for both boys and girls.

Finally, the moderating effect of adverse social experiences may also differ by sex, and this warrants examination as well. Girls with aggressive behaviors are more likely than aggressive boys to experience unfavorable responses from peers, probably because aggression in girls violates social norms more than aggression in boys (Miller-Johnson et al., 2002). Responses to peer rejection may also differ by sex, with boys more likely than girls to respond to rejection with counter-aggression (DeRosier, Kupersmidt, & Patterson, 1994; Zakriski, Wright, & Underwood, 2005) and antisocial behaviors (Lewin et al., 1999). Experience of low parental warmth may also differ by sex. For instance, compared to boys, girls typically report less parental rejection (Sentse, 2009) but react more strongly to perceived parental rejection, with aggression (Hale et al., 2005) and internalizing problems (Sentse, 2009). These studies reflect the potential moderation of developmental trajectories by sex.

In sum, because potential sex differences have been found in the prevalence and trajectories associated with conduct problems and borderline mood features, it would be important to examine whether the hypothesized diathesis-stress model applies equally to both boys and girls. The current study thus examined sex differences in the diathesis-stress model.

The Present Study

The present study had three aims. Focusing on the late adolescent outcomes of high-risk, aggressive-disruptive children, the first aim of the study was to determine whether groups of youths who exhibited symptoms characteristic of conduct problems and borderline mood features could be distinguished empirically. The second aim of the study was to determine whether the youth who were differentially characterized by conduct problems or borderline mood features in late adolescence showed distinctive early childhood vulnerabilities. Finally, the third aim of the study was to examine whether negative social experiences during middle

childhood (peer rejection and low parental warmth) acted as moderators of the link between early childhood vulnerabilities and later adolescent outcomes.

Together, these three study aims were designed to test a diathesis-stress model linking specific early childhood vulnerabilities (overt aggression, negative emotional reactivity) to distinct adolescent outcomes (serious conduct problems, borderline mood features), with the stress of adverse social experiences in middle childhood (low parental warmth, peer rejection) compounding the risk posed by early childhood vulnerabilities. The model helps explain how developmental pathways diverge and lead to these two different outcomes among children who show early externalizing problems, in particular aggressive, oppositional, and/or disruptive behavior problems at school entry. Separate early vulnerabilities are hypothesized to lead to conduct problems and borderline mood features. Overt aggression is hypothesized to be a specific early vulnerability for adolescent conduct problems, whereas negative emotional reactivity is hypothesized to be a specific early vulnerability for adolescent borderline mood features. Adverse social experiences with peers (rejection) and parents (low warmth) are hypothesized to amplify these links, increasing the risk of adolescent conduct problems among children with early overt aggression and increasing the risk of adolescent borderline mood features among children with early negative emotional reactivity. Thus, adverse social experiences are hypothesized to moderate the relationship between early vulnerabilities and adolescent outcomes. A conceptual diagram of the overall diathesis-stress model is presented below as Figure 1.

Figure 1. Conceptual Diagram of the Hypothesized Diathesis-Stress Model

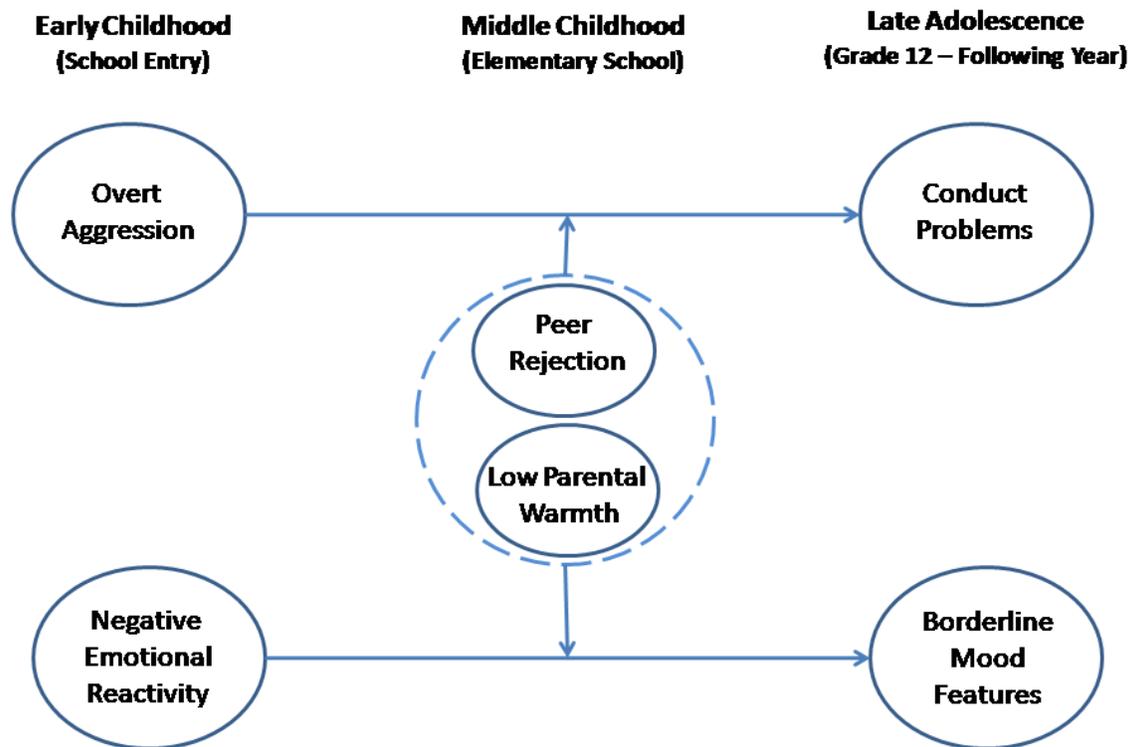


Figure 1. Diathesis-stress model with early childhood vulnerabilities and adverse social experiences, predicting to specific adolescent outcomes, is depicted. Adverse social experiences of peer rejection and low parental warmth are hypothesized to moderate the link between overt aggression and conduct problems as well as the link between negative emotional reactivity and borderline mood features.

Hypotheses

In order to test the model above, the present study will test the following hypotheses:

H1. Conduct problems and borderline mood features emerge as distinct profiles of maladjustment in adolescence.

H2. Distinct early childhood vulnerabilities specifically and differentially predict to conduct problems and borderline mood features in adolescence.

H2a. Overt aggression in early childhood is a specific predictor of conduct problems in

adolescence.

H2b. Negative emotional reactivity in early childhood is a specific predictor of borderline mood features in adolescence.

H3. Adverse social experiences in middle childhood moderate the impact of early childhood vulnerabilities on the development of conduct problems and borderline mood features in adolescence.

H3a. Peer rejection amplifies the link between early overt aggression and adolescent conduct problems.

H3b. Peer rejection amplifies the link between negative emotional reactivity and adolescent borderline mood features.

H3c. Low parental warmth amplifies the link between early overt aggression and adolescent conduct problems.

H3d. Low parental warmth amplifies the link between early negative emotional reactivity and adolescent borderline mood features.

The hypothesized model was tested with a sample of children recruited as part of the Fast Track project, a longitudinal intervention study targeting children at risk for conduct problems. The sample for the present study consisted of children assigned to the high-risk control condition, who had exhibited high rates of teacher and parent-reported aggressive, oppositional, and/or defiant behavior problems at school entry. The diatheses of overt aggression and negative emotional reactivity were assessed at school entry through teacher reports, and the moderators of peer rejection and low parental warmth during middle childhood were assessed using peer nominations and observer reports, respectively. Late adolescent outcomes of conduct problems

and borderline mood features were assessed through self- and parent-reports in the two years corresponding to grade 12 and the subsequent year.

Method

Participants

The 446 participants in this study were recruited for the Fast Track project, a multi-site, longitudinal intervention of children at risk for conduct problems (CPPRG, 1992). The participants in this study comprised the high-risk control group within the Fast Track project, as described below. Participants who received intervention or were classified in the normative control group only were not included in the current study because the current study sought to test the relationships between early risk and later psychosocial outcomes among children who evidenced early risk.

A total of 55 schools in high-risk areas were selected on the basis of elevated levels of poverty and neighborhood crime at four study sites (Durham, North Carolina; Nashville, Tennessee; Seattle, Washington; rural central Pennsylvania). From these schools, children were recruited for the Fast Track project when they were in kindergarten, using a multiple-gating screening procedure (Lochman, 1995). Sample selection took place over a three-year period, creating three successive cohorts. In the first stage of the screening process, kindergarten teachers provided ratings for all students (total $n = 9,594$) using a 14-item measure assessing aggressive, oppositional, and disruptive behaviors (Teacher Observation of Child Adaptation-Revised [TOCA-R]; Werthamer-Larsson, Kellam, & Wheeler, 1991). Those children scoring in the top 40% within cohort and site were then recruited for the second stage of screening with parents. In this second stage, parents rated 24 items describing externalizing behaviors, drawn

primarily from the Child Behavior Checklist (CBCL; Achenbach, 1991a). The teacher and parent ratings were standardized within site and summed to yield a total severity-of-risk screen score. Children with the highest screen scores were recruited into the high-risk sample, in decreasing order of severity, until desired sample sizes for the cohort, site, and condition were reached. Using this screening process, three cohorts were recruited for the Fast Track project between 1991 and 1993 (CPPRG, 1999).

A total of 891 high-risk children were thus recruited and underwent initial assessments. Their assignment to the intervention or control condition of the Fast Track project depended upon the school they attended in first grade. Schools at each site were matched into sets that were comparable on size, ethnic composition, and poverty, and randomly assigned (by set) to intervention and control conditions. The high-risk control group used in this study included the 446 youths who attended the control schools. In addition to these high-risk youth, a normative sample of approximately 100 children per site was recruited from the control schools ($n = 387$). In this study, the normative sample was used to calibrate the thresholds used to identify elevated levels of particular problems.

Among the 446 children in the high-risk control sample who were the participants in this study, 317 (71%) had complete childhood data (between kindergarten and 4th grade) and at least partial data during late adolescence (between 12th grade and the subsequent year) and thus had adequate data to be entered into analysis. Hence, the study sample included 317 participants, of whom 110 (35%) were female and 207 (65%) were male. A summary of the demographic information for the sample is presented in Table 1 below.

Table 1

Demographic Characteristics of the Study Sample

Demographic Characteristics	Total Sample (<i>n</i> = 317)	Sex	
		Male (<i>n</i> = 207)	Female (<i>n</i> = 110)
Age at Study Entry (in Years)	6.52 (.47)	6.44 (.47)	6.39 (.47)
Race			
White	152 (47.9%)	95 (45.9%)	57 (51.8%)
Black	159 (50.2%)	108 (52.2%)	51 (46.4%)
Other	6 (1.9%)	4 (1.9%)	2 (1.8%)
Site			
Durham	93 (29.3%)	68 (32.9%)	25 (22.7%)
Nashville	74 (23.3%)	48 (23.2%)	26 (23.6%)
Central Pennsylvania	91 (28.7%)	55 (26.6%)	36 (32.7%)
Seattle	59 (18.6%)	36 (17.4%)	23 (20.9%)

Note. Mean and standard deviations are shown for age. Column percentages are shown for each variable in parentheses. No differences were found by sex for any of the demographic characteristics.

In terms of the family demographic characteristics for these participants, approximately half (56%) of the participating children resided with both female and male heads of household, with 43% living with a female head of household only and 1% living with only a male head of household. Most of the female heads of household were biological mothers (92%). Male heads of household were largely biological fathers (64%), though 13% were stepfathers and 11% were friends of the mother. The median household income for the participating children, at school entry, fell in the range of \$14,001 - \$20,000 annually. The majority (54%) of the children lived in households with an annual income of less than \$20,000.

Procedures

Parent-report and youth-report data were collected during annual summer interviews conducted at participants' homes. Parents and youth were interviewed separately by trained research staff members. The interviewer read through all questionnaires and recorded responses. Youth interviews in adolescence were computer-administered in order to increase privacy and confidentiality. In these computer-administered interviews, the respondents used a laptop computer to listen to questions being read aloud on headphones and responded to them on the laptop. For teacher-report data, interviewers visited schools to explain the measures to teachers, and teachers completed and returned measures to the Fast Track project. Parents, children, and teachers received financial compensation for their participation.

Measures

The following measures from the Fast Track project were used for the present study. Detailed descriptions of the measures are available at the Fast Track study website at www.fasttrackproject.org. All measures were scored such that higher scores reflected the construct being assessed. Early childhood vulnerabilities of overt aggression and negative emotional reactivity, the main predictors, were assessed at the two years surrounding school entry (kindergarten and first grade). Adverse social experiences of peer rejection and low parental warmth, the moderators, were assessed during the first four elementary school years. Late adolescent outcomes were assessed in study years 13 and 14, which correspond to the last year of high school for youth who were progressing annually and the subsequent year (age range approximately 17-20 years).

Adolescent outcomes. Adolescent outcomes included indices of conduct problems and borderline mood features, assessed using parent and youth report.

Conduct problems. Adolescent conduct problems included index offenses (delinquent activities) and conduct disorder symptoms. Adolescents reported on their index offenses during study years 13 and 14 (corresponding to 12th grade and the subsequent year) using the *Self-Report of Delinquency* measure adapted from the Pittsburgh Youth Study (Elliott, Huizinga, & Ageton, 1985). For each of 13 offenses (e.g., property damage, theft, assault), adolescents indicated whether they had committed the delinquent activity in the past year (0 = No; 1 = Yes). Parents reported on the youth's commission of four of the same index offenses in study year 13 on the *Parental Report on Child Delinquency* (CPPRG, 1997), also coded dichotomously such that a score of 1 indicated the presence of the delinquent activity. These 30 items (youth report on 13 offenses for each of two years, and parent report on 4 offenses in one year) were then averaged in order to create a total score representing index offenses, producing an internally consistent scale ($\alpha = .82$). In order to create a dichotomous score for latent class analyses, youths with scores falling above one standard deviation from the mean of the normative sample were identified as significantly elevated in levels of index offenses ($n = 39$; 12% of the sample).

Symptoms of conduct disorder were assessed using youth and parent reports on the *Diagnostic Interview Schedule for Children* (DISC; Shaffer & Fisher, 1997). The DISC is a structured interview assessing symptoms of DSM-IV disorders and was administered to adolescents in a computerized form on a laptop computer and to parents in an interview during study year 13. Respondents indicated whether the adolescent had exhibited any of the 15 symptoms of conduct disorder in the previous year (No, Yes, Not Applicable, or Don't Know). To combine youth and parent reports, each item was coded dichotomously (0 = Absent; 1 = Present) and received the score of 1 if either parent or youth endorsed the symptom as being present during the past year. The total score for this conduct disorder scale was created by taking

the mean of the 15 item scores ($\alpha = .61$). A dichotomous score was created for the latent class analyses by identifying youths with conduct disorder scores that fell above one standard deviation relative to the mean of the normative sample ($n = 43$ with elevated conduct disorder symptom scores; 14% of the sample).

Borderline mood features. Three borderline mood features were assessed using youth and parent reports of depressed mood, suicidality, and anger.

In study year 13, symptoms of depressed mood were assessed using youth and parent reports on the *Diagnostic Interview Schedule for Children* (DISC; Shaffer & Fisher, 1997). Four items on the DISC focused on depressed mood (e.g., “Depressed mood or irritable mood”; “Worthlessness or guilt”; “Diminished interest or pleasure”) and were rated as “Present” (score of 1) in the past year if either the youth or the parent endorsed the item. The absence of the symptom was indicated with a score of 0. In the following year, study year 14, youth reported on five items assessing depressed mood on the *Brief Symptom Inventory-Young Adult* (BSI; Derogatis, 1975), a measure with demonstrated concurrent validity and strong test-retest reliability (Derogatis & Melisaratos, 1983). Youths rated the degree to which they were distressed by each of these depressive symptoms during the prior week, using a five-point Likert scale. Any symptom that received a distress rating of “Moderately” (2) or higher was coded as indicating the presence (presence = 1; absence = 0) of that endorsed symptom. These 9 dichotomously coded items (4 from the DISC and 5 from the BSI) were averaged to create a depressed mood scale, with good internal consistency ($\alpha = .75$).

Items indicating suicidality were also taken from the *DISC* (in study year 13) and the *BSI* (in study year 14). The DISC included two items regarding suicidality (“Thoughts of death, suicidal ideation, suicide attempt, or plan”; “Talked seriously about killing self”), which were

scored as “present” (present = 1; absent = 0) if either the youth or the parent endorsed the symptom for the prior year. The BSI included one item on suicidality (“How often were you distressed by thoughts of ending life?”), which was coded as present (present = 1; absent = 0) if the youth gave it a distress rating of “Moderately” (2) or higher. These three items (two from the DISC and one from the BSI) were averaged to create a suicidality scale ($\alpha = .52$).

Anger was measured using youth and parent-report measures of angry and oppositional behaviors. Both reporters responded to five items on the *DISC* pertaining to anger and oppositionality (e.g., “Angry and resentful”; “Loses temper”; “Touchy or easily annoyed”; “Argues with adults”). Each item was coded dichotomously (0 = absent; 1 = present) and received the score of 1 if either parent or youth endorsed the symptom as being present during the past year. In addition, parents reported on the daily presence of youth anger on the *Parent Daily Report* (PDR; Chamberlain & Reid, 1987). This measure was administered once during the summer interview of study year 13 and again during two telephone calls held within two weeks after that interview. Each time, parents were asked whether or not the youth had “argued or talked back to an adult.” If parents reported this argumentative youth behavior on two or more of the three days surveyed, the youth received a score of “1” representing elevated anger; otherwise, the youth received a score of “0.” The six items from the DISC and this item from the PDR were then averaged to create an overall scale score for anger ($\alpha = .81$).

For the latent class analyses, youths were identified as elevated in depression, suicide, or anger if their scores exceeded the threshold of one standard deviation above the mean for the normative sample. Using this criterion, 18% ($n = 57$) of youths in the sample experienced significantly elevated depressed mood in adolescence, 9% ($n = 27$) experienced suicidality, and 22% ($n = 70$) experienced elevated anger.

Early childhood vulnerabilities. Early childhood vulnerabilities of overt aggression and negative emotional reactivity, the main predictors of adolescent outcomes, were measured using teacher-report measures at kindergarten and 1st grade.

Overt aggression. Overt aggression was measured using the *Teacher's Report Form* (TRF; Achenbach, 1991b), which requires teachers to indicate the presence of child behavior problems using a 3-point scale (0 = Not True; 1 = Somewhat or Sometimes True; 2 = Very True or Often True). Using confirmatory factor analyses, a narrow-band scale assessing overt aggression was validated as a distinct dimension of externalizing behavior assessed by this instrument (Rains, 2003; Stormshak & Bierman, 1998). This 6-item subscale, containing such items as "Cruelty, bullying, or meanness to others," or "Physically attacks people," was used in this study, as it provided a specific assessment of overt aggression ($\alpha = .86$) that could be distinguished from the oppositional and impulsive items that load on the broad-band externalizing scale. Ratings provided by each teacher were summed and divided by the number of items (6) to create an average aggression score that ranged in value between 0 and 2, and the ratings provided by kindergarten and first-grade teachers on this scale were averaged to provide a single indicator of early childhood overt aggression.

Negative emotional reactivity. Teachers also rated the child's negative emotional reactivity using the *Social Health Profile* (CPPRG, 1991). Four items comprise the Emotional Regulation subscale on this measure ("Can calm down when excited or all wound up"; "Controls his/her temper when there is a disagreement"; "Expresses needs and feelings appropriately"; "Thinks before acting"), each rated on a 6-point Likert scale ranging from Not at all (0) to Almost always (5). Items were reverse-scored and averaged in order to create an indicator of negative emotional reactivity for each year ($\alpha = .82$). Ratings from kindergarten and first grade

teachers were standardized each year and then averaged to provide a single indicator of early childhood negative emotional reactivity.

Aversive social experiences. Two types of aversive social experiences were assessed during the early elementary years (first through fourth grades) and were combined to create an index reflecting the chronicity of exposure to negative social experiences.

Peer rejection. Peer rejection was assessed using peer nominations. Research assistants met with children individually at school, presenting them with the roster of students in their classroom and reviewing each one to determine their familiarity. Then, children were asked to nominate classmates who they “most liked” and those who they “least liked.” Unlimited nominations were accepted. Nominations for each child were summed and standardized within each classroom. Using a method developed by Asher and Dodge (1986), a child was classified as rejected if the following criteria were met: a.) the difference between standardized “Liked Most” and standardized “Liked Least” scores was at least one standard deviation below the class mean; b.) the standardized sum of the “Like Least” nominations was above the class mean; and c.) the standardized sum of the “Like Most” nominations was below the class mean. A variable indicating the chronicity of exposure to peer rejection was created by examining the number of years that a child was identified as peer-rejected across the four measurement occasions (1st grade to 4th grade). If the child was never rejected, he/she received a score of 0. If the child was rejected once, he/she received a score of 1, and if the child was rejected two or more times over the four years, he/she received a score of 2.

Low parental warmth. Low parental warmth between first and fourth grades was assessed using observer ratings on the *Post-Visit Reaction Inventory* (CPPRG, 1990). Within 24 hours of completing the summer home visit, the parent interviewer completed ratings, which

included three items describing warm parental behavior directed at the child (speaking to the child in a positive tone, giving attention to the child when the child is talking, and positively reinforcing positive child behaviors). The interviewers providing the ratings were trained to a minimum of 70% agreement with the criterion observer at each site through manualized instruction, guided practice and role play, and videotaped practice. To prevent observer drift, weekly coding meetings, regular conference calls, and annual training of lead observers were conducted (for more information, see CPPRG, 1999). Each of these items was rated on a 4-point scale (Can't Rate = 0, Didn't Occur = 1, Occurred Once = 2, and Occurred More than Once = 3). The "can't rate" rating was treated as missing data. The parental warmth score for each year was calculated by taking a sum of these items ($\alpha = .87$), and cases with missing data on any of the items received a weighted sum score, calculated by multiplying the average score of the items for which data was present by the number of items present (3). Parental warmth was considered low in a given year if this scale score fell below one standard deviation below the normative sample mean, which corresponded to each of the warm behaviors not occurring or occurring only once, on average. A variable indicating the chronicity of exposure to low parental warmth was created by examining scores across the four measurement occasions (1st grade to 4th grade). If the parental warmth was never low, the child's exposure score was 0. If parental warmth was low for one year only, the child's exposure score was 1, and if parental warmth was low for 2 or more times over the four years, the child's exposure score was 2.

In order to allow comparison of these two types of negative social experiences (e.g., exposure to peer rejection and low parental warmth), both constructs were assessed over the same time period (first through fourth grade) and in terms of chronicity of exposure to a level chosen as an indicator of significant stress. This was done for several reasons: 1.) Coding the

chronicity of exposure to these adverse experiences allowed the data to be summarized in a meaningful manner, creating distinction among those who never experienced peer rejection or low parental warmth, those who experienced it only for a limited time, and those who experienced it multiple years or chronically; 2.) Because peer rejection was assessed using a categorical scale and low parental warmth was assessed using a continuous scale, it was necessary to create a coding system that could be comparable across both types of variables; and 3.) Counting the number of years these adverse experiences had occurred also allowed the available data to be summarized meaningfully while minimizing the impact of missing data (e.g., taking an average or sum across the four measurement occasions would have distorted the data for those who had incomplete data).

Results

Analytic Plan

Data were examined for missingness, and preliminary analyses were conducted in order to obtain descriptive statistics, examine relationships among study variables, and examine whether demographic variables were correlated with study variables. The first aim of the study was to determine whether children with early externalizing problems at school entry diverged into two distinct profiles of later adolescent adjustment difficulties – one characterized primarily by conduct problems (index offenses and conduct disorder symptoms) and the other characterized primarily by borderline features (depressed mood, suicidality, and anger), depending on whether they showed elevations in overt aggression or negative emotional reactivity at school entry. To test this hypothesis, latent class analysis (LCA; L. M. Collins & Lanza, 2010) was conducted in order to identify latent classes of symptom patterns that emerged among adolescents in the high-risk control sample at ages 17-19. The second aim of the study

was to determine the impact of early childhood vulnerabilities (negative emotional reactivity, overt aggression) on these late adolescent outcomes and examine the moderating effect of adverse social experiences (peer rejection, low parental warmth) on the link between early childhood vulnerabilities and late adolescent outcomes. These prediction and moderation models were tested using LCA by entering early childhood and middle childhood variables as covariates in LCA analyses.

Descriptive Analyses

First, missingness in the data was examined. Out of the 446 eligible participants in the high-risk control sample of the Fast Track project, 444 participants had data for early childhood vulnerabilities of overt aggression and negative emotional reactivity, assessed in kindergarten and first grade. Between grades 1-4, when the moderators or the adverse social experiences were assessed, 408 children (91%) had at least one rating of peer rejection and 422 children (95%) had at least one rating of low parental warmth, and 387 children (87%) had both peer and parent information. In years 13-14 of the study, which correspond to grade 12 and the subsequent year, when adolescent outcomes of conduct problems and borderline mood features were assessed, 350 (78%) of the participants had at least partial data. Overall, 317 (71%) cases had complete data available for early childhood vulnerabilities (predictors) and adverse social experiences (moderators), as well as at least partial data for adolescent symptoms (outcome), which provided a basis for the estimation of the LCA models and hypothesis-testing regarding developmental prediction of the adolescent latent classes. The analyses in this study utilized these 317 participants.

Demographic characteristics of the 317 children who were included in analyses and those of the 129 children who did not have adequate data to be included in analyses did not

significantly differ, with the exception of the site from which they were recruited. Children with inadequate data tended to be in schools from Seattle (39% of those excluded from analysis) and from Nashville (33% of those excluded from analysis) rather than in schools from rural central Pennsylvania (16%) or Durham (12%). These site differences were statistically significant, $\chi^2(3, N = 446) = 34.62, p < .001$. Compared to those retained in the analyses, the 129 children who were excluded from analysis also had higher scores in initial levels of overt aggression, $F(1, 443) = 3.97, p = .05$, and negative emotional reactivity, $F(1, 442) = 4.72, p = .03$. Data comparing the children included and excluded in analysis are shown in the Appendix.

Next, descriptive analyses were conducted (see Table 2). Overt aggression scores, which were average item scores (range 0-2), suggest that participants had about 4 (of 6) symptoms of overt aggression rated at least “somewhat/sometimes true” (rating of 1) on average.

Standardized negative emotional reactivity scores ranged from -1.86 to 2.21, with an elevated sample mean of about one-half standard deviation (relative to children within the high-risk control and normative samples). ANOVAs revealed significantly higher scores for boys than girls on overt aggression and negative emotional reactivity, $F(1, 315) = 29.40, p < .001$ and $F(1, 315) = 8.61, p < .01$, respectively.

Adverse social experiences reflected the number of years a child experienced peer-nominated rejection status ($M = .98, SD = 1.16$) or observer-rated low parental warmth ($M = .76, SD = .86$). For each type of adverse social experience, approximately half of the children in the sample had no such experience during the first four years of elementary school, roughly one-third of the children had experienced it once, and the remainder had experienced it more than once. In addition, boys had significantly higher number of peer rejection experiences compared to girls, $\chi^2(2, N = 317) = 8.62, p < .01$.

Adolescent outcomes were dichotomous, representing scores higher than one standard deviation above the normative sample mean. Rates of adolescent problems ranged from 9% (for suicidality) to 22% (for anger). The low rate for suicidality reflects the fact that suicidal thoughts and behaviors were rare events and rarely reported, even in this high-risk sample, with only 9% of the adolescents in the sample ever reporting any suicidality. Elevations in index offenses and conduct disorder symptoms showed lower rates than would be expected. This is most likely due to the fact that both types of criminality are relatively rare events and have a distribution that is modal at zero and is skewed to the right. Exploratory analyses showed that using the cutoff of one standard deviation for the normative sample mean would have resulted in 8% of the normative sample being classified as elevated in either index offenses or conduct disorder symptoms, whereas 12% and 14% of the current high-risk sample were found to be elevated. Thus, the lower than expected rate of elevation in these adolescent symptoms in the current sample is likely due to the distribution of these symptoms. Depressed mood, suicidality, anger problems, and conduct disorder symptoms occurred at similar rates for boys and girls. However, significantly more boys than girls showed elevations in index offenses, $\chi^2(1, N = 317) = 11.82, p < .01$ (see Table 2).

Table 2

Descriptive Statistics for Study Variables

Variable	Full Sample (<i>n</i> = 317)	Sex	
		Male (<i>n</i> = 207)	Female (<i>n</i> = 110)
Early childhood vulnerabilities			
Overt aggression	.61 (.48)	.72 (.48)	.42 (.41)
Negative emotional reactivity	.30 (.77)	.39 (.76)	.12 (.75)
Adverse social experiences			
Peer rejection			
Never	143 (45.1%)	81 (39.1%)	62 (56.4%)
One year	95 (30%)	69 (33.3%)	26 (23.6%)
Multiple years	79 (24.9%)	57 (27.5%)	22 (20.0%)
Low parental warmth			
Never	150 (47.3%)	97 (46.9%)	53 (48.2%)
One year	109 (34.4%)	72 (34.8%)	37 (33.6%)
Multiple years	58 (18.3%)	38 (18.4%)	20 (18.2%)
Adolescent outcomes			
Depressed mood	57 (18.0%)	36 (17.4%)	21 (19.1%)
Suicidality	27 (8.5%)	18 (8.7%)	9 (8.2%)
Anger	70 (22.1%)	50 (24.2%)	20 (19.8%)
Index offenses	39 (12.3%)	35 (16.9%)	4 (3.6%)
Conduct disorder symptoms	43 (13.6%)	33 (15.9%)	10 (9.1%)

Note. Mean and standard deviation are shown for overt aggression and negative emotional reactivity. Number of cases is displayed for adverse social experiences and adolescent outcomes, with column (within-group) percentages shown in parentheses.

Next, correlations were computed to assess associations among the variables (Table 3). The two early childhood vulnerabilities of overt aggression and negative emotional reactivity were significantly correlated ($r = .61$), which suggests that these two constructs co-occurred but were also distinct. As anticipated, early childhood overt aggression predicted late adolescent index offenses and conduct problems ($r = .13$ and $.14$, respectively). In addition, overt aggression was correlated with later suicidality ($r = .12$). Consistent with expectations, negative emotional reactivity in early childhood was significantly correlated with late adolescent depressed mood, suicidality, and anger ($r = .11$, $.14$, and $.12$, respectively).

The adverse social experiences, the two moderators, were surprisingly not correlated. This suggests that adverse social experiences with peers (peer rejection) and parents (low parental warmth) are distinct and independent of one another. Whereas peer rejection was associated with child overt aggression and negative emotional reactivity ($r = .24$ and $.31$, respectively), low parental warmth was significantly associated only with early negative emotional reactivity ($r = .11$). Neither peer rejection nor low parental warmth was significantly correlated with any of the late adolescent outcomes.

The three adolescent problems identified in this study as borderline mood features (e.g., depressed mood, suicidality, and anger) were moderately inter-correlated (r s ranging from $.26$ -. $.36$), and the two adolescent indicators of conduct problems (e.g., index offenses and conduct disorder symptoms) were significantly inter-correlated ($r = .43$). Although index offenses and conduct problems were significantly correlated with anger (r s = $.18$ and $.34$), they were largely unrelated to depressed mood or suicidality, with the exception of a modest correlation between conduct problems and depressed mood ($r = .16$). Overall, the pattern of inter-correlations that emerged among the measures was in alignment with the hypothesized measurement model.

Table 3

Intercorrelations Among the Study Variables

Variable	1	2	3	4	5	6	7	8	9
1. Overt aggression	--								
2. Negative emotional reactivity	.61**	--							
3. Peer rejection	.24**	.31**	--						
4. Low parental warmth	.07	.11*	.10	--					
5. Depressed mood	.02	.11*	.06	.00	--				
6. Suicidality	.12*	.14**	.10	.04	.36**	--			
7. Anger	.08	.12*	.08	.04	.26**	.32**	--		
8. Index offenses	.13*	.08	.07	.04	.08	.06	.18**	--	
9. Conduct problems	.14*	.05	.07	.05	.16**	.07	.34**	.43**	--

Note. Pearson correlation is given for variables 1-2, and point-biserial correlations are given for correlations between continuous (variables 1-2) and dichotomous (variables 5-9) variables. Spearman rank correlations are given for correlations between continuous (1-2) and ordinal (3-4) variables, and phi correlations are given for correlations among dichotomous (5-9) variables.

* $p < .05$. ** $p < .01$.

Latent Class Analysis Models of Adolescent Symptom Patterns

Latent class analysis (LCA; L. M. Collins & Lanza, 2010) was used to test the hypothesis (Hypothesis 1) that symptom profiles associated with conduct problems and borderline features would emerge as differentiated classes in late adolescence. Latent class analysis is a statistical procedure that models latent groups based on categorical observed indicators. This procedure permits identification of the number of latent groups that may be indicated by observed variables and provides information regarding the distribution of class membership and the probability of membership in each class given elevation in the observed indicators. LCA was conducted in order to assess latent classes of symptom profiles in late adolescence, based on observed indicators for the following five constructs reflecting symptoms relevant to borderline mood features and conduct problems: 1) Depressed mood, 2) Suicidality, 3) Anger, 4) Index offenses, and 5) Conduct problems.

The latent class analyses were conducted in SAS using the `proc lca` procedure (Lanza, Lemmon et al., 2010). LCA models with two to five latent classes were compared based on indicators of model fit, including Akaike information criterion (AIC), Bayesian information criterion (BIC), and entropy-R squared.

Table 4

Comparison of Latent Class Analysis Solutions

Indicator of model fit	Number of latent classes			
	2	3	4	5
AIC	71.52	51.18	57.78	67.72
BIC	112.87	115.08	144.24	176.73
Entropy R-Squared	.67	.83	.70	.57

The AIC and the BIC allow comparison of model fit, with lower values indicating better model fit, taking into account the number of parameters being estimated. As shown in Table 4 above, the three-class solution provided the best fit to the data according to the AIC. The two-class solution had the smallest BIC, but the three-class solution also had a relatively low BIC. Entropy R-squared provides an estimate of model fit, with values ranging from 0 to 1 and a higher value indicating better model fit, and the three-class solution had considerably higher entropy R-squared than the other models. Overall, the three-class solution appeared to have the best model fit out of the four models tested, given that it had the lowest AIC value, close to the lowest BIC value, and the highest entropy R-squared value. In addition, the three-class solution was readily interpretable. Thus, the three-class solution was chosen as the final model of describing distinct classes of distress observed in late adolescence. The item-response probabilities, or the probabilities that someone belonging to a class would show an elevation in the symptom, are summarized in Table 5 below.

Table 5

Item-Response Probabilities of Elevated Symptoms Based on Latent Class

Symptoms	Latent Class		
	Low-Problem Comparison (78.2%)	Conduct Problems (15.3%)	Borderline Mood Features (6.5%)
Depressed mood	0.10	0.35	0.77
Suicidality	0.01	0.15	0.78
Anger	0.11	0.66	0.76
Index offenses	0.06	0.53	0.01
Conduct disorder symptoms	0.03	0.81	0.02

In this three-class LCA solution, one large class had a membership probability of 78.2%. Low item-response probabilities associated with this class shows that the members of this class were unlikely to have any of the adolescent problems. Probabilities of suicidality or conduct disorder symptoms were less than .05 and probabilities of depressed mood, anger, and index offenses were all less than .12. Hence, this class was labeled the “low-problem comparison” class. The second class, which had a membership probability of 15.3%, was characterized by high probabilities of elevations in adolescent problems involving angry/oppositional behaviors (.66), index offenses (.53), and conduct disorder symptoms (.81), but relatively low probabilities of suicidality (.15) or depressed mood (.35). This class was labeled the “conduct problem” class. Finally, the third class had a membership probability of 6.5%. Members of this class had a high probability of elevations in depressed mood (.77), suicidality (.78), and angry/oppositional behaviors (.76) but very low probabilities (less than .05) of index offenses or conduct disorder symptoms. This class was labeled the “borderline mood features” class.

The equivalence of the 3-class LCA solution for adolescent boys and girls was also tested, because the prevalence of conduct problems and borderline pathology has been shown to differ by sex, with more boys than girls presenting with conduct problems (Bierman, 2004; Loeber et al., 2000; Sentse, 2009) and more girls than boys believed to present with internalizing problems (Kasen et al., 1999) and borderline pathology (Bradley et al., 2005). This was achieved using a test for measurement invariance across groups (L. M. Collins & Lanza, 2010; Lanza, Collins, Lemmon, & Schafer, 2007), which determined whether the 3-class LCA solution had similar item-response probabilities for boys and girls. This test for measurement invariance compared two models, one model that is estimated for both sexes free of constraints, and another that is estimated for both sexes while constraining the item-response probabilities to be equal

across sexes. The assumption of measurement invariance (that the item-response probabilities are equal across sexes) would have been considered violated if the model fit statistics for these unconstrained and constrained models were significantly different. In order to compare model fit, deviance (the difference between the log-likelihoods for the models, multiplied by -2) was computed and tested against the chi-square distribution with 15 degrees of freedom. The test revealed that there was no statistically significant difference by sex for the item-response probabilities, supporting the assumption that the 3-class LCA solution is valid for both sexes. However, the prevalence of the classes differed for boys and girls. The probability of membership in the conduct problem class was 18% for boys and 7% for girls, whereas the probability of membership in the borderline mood features class was 6% for boys and 12% for girls. As such, the three classes were distributed differently for adolescent boys and girls. Thus, it was still possible that sex would predict class membership.

To examine the degree to which sex was a significant predictor of a youth's membership in the latent classes, sex was entered as a covariate (coded such that 0 = female and 1 = male) in the LCA model. Sex was a significant covariate, $\chi^2(2, N = 317) = 6.36, p = .04$, and male sex was associated with marginally significant, increased probability of belonging to the conduct problems class over the low-problem comparison class, $\beta = 1.34, t(315) = 1.88, p = .06, OR = 3.81, 95\% CI [.94, 15.47]$. Thus, boys had higher odds of having conduct problems compared to girls. Sex did not significantly affect the probability of membership in the borderline mood features class.

To provide a concrete representation of the breakdown by sex for the three latent classes, one additional descriptive analysis was undertaken. For this analysis, each adolescent was classified into one of three groups corresponding to the three LCA classes (low problem

comparison, conduct problem, borderline mood features) based on the posterior probabilities of class membership that were generated with the LCA model. The modal assignment procedure was used such that each adolescent was assigned to the class with highest posterior probability. As shown in Table 6, the number of boys and girls in the borderline mood features class was equivalent, but twice as many boys as girls were in the conduct problem class in late adolescence.

Table 6

Cross-Tabulation of Probable Class Membership by Sex

Probable class	Male (<i>n</i> = 207)	Female (<i>n</i> = 110)
Low-problem comparison	160 (77.3%)	93 (84.5%)
Conduct problem	34 (16.4%)	9 (8.2%)
Borderline mood features	13 (6.3%)	8 (7.3%)

Note. Cells contain the number of cases and its proportion within sex. Probable class membership refers to class membership based on posterior probabilities from latent class analysis, using modal assignment.

Prediction of Adolescent Profiles from Early Childhood Vulnerabilities

It was hypothesized that the early childhood vulnerabilities of overt aggression and negative emotional reactivity would differentially predict the likelihood of developing adolescent problems characterized primarily by conduct problems or by borderline mood features, respectively (Hypotheses 2a-2b). LCA was used to test this hypothesis.

These analyses used the `proc lca` procedure in SAS software (Lanza, Dziak, Huang, Xu, & Collins, 2011), entering the two predictor variables (childhood overt aggression and

negative emotional reactivity) as covariates. Entering a predictor variable as a covariate in the `proc lca` procedure allows simultaneous estimation of the LCA model and the covariate's influence on the probability of belonging in one class over another reference group that is designated by the analyst (Lanza et al., 2007), using logistic regression. The procedure estimates the overall significance of the covariate in improving model fit as well as the beta coefficients from the logistic regressions predicting class membership. In this study, the "low problem comparison" class was chosen to be the reference group, such that the significance of the covariates were tested based on how they influenced the probability of belonging in the conduct problem or the borderline mood features class over the low-problem comparison class.

Overt aggression and negative emotional reactivity were each centered by subtracting the variable mean and tested simultaneously as covariates, because it was of theoretical interest to test whether they made independent and differential prediction of the distinct adolescent problem profiles. Moreover, because overt aggression and negative emotional reactivity were significantly correlated with one another ($r = .61$), it was important to test the effect of each after controlling for the other.

Main effects emerged for both overt aggression and negative emotional reactivity. Entering each covariate significantly improved model fit, $\chi^2(2, N = 317) = 5.90, p = .05$ for overt aggression, and $\chi^2(2, N = 317) = 6.63, p = .04$ for negative emotional reactivity. When the logistic regression coefficients were examined, overt aggression predicted significantly higher probability of membership in the conduct problem class compared to the low-problem comparison class, $\beta = 1.11, t(314) = 2.26, p = .03, OR = 3.03, 95\% CI [1.16, 7.92]$, but did not significantly affect the probability of membership in the borderline mood features class. In contrast, negative emotional reactivity significantly increased the probability of membership in

the borderline mood features class compared to the low-problem comparison class, $\beta = 1.36$, $t(314) = 2.31$, $p = .02$, OR = 3.90, 95% CI [1.23, 12.34], but did not significantly influence the probability of belonging to the conduct problem class.

These findings supported Hypothesis 2, as overt aggression in early childhood was associated with increased odds of belonging in the conduct problem class in late adolescence, whereas negative emotional reactivity in early childhood was associated with increased odds of belonging in the borderline mood features class in late adolescence. These effects were specific, in that overt aggression and negative emotional reactivity each showed unique associations with distinct adolescent problem profiles. Moreover, these effects were present while entering both overt aggression and negative emotional reactivity into analysis simultaneously so that these early childhood vulnerabilities controlled for one another.

To determine whether the differential representation of boys in the conduct problem class affected these findings, sex was entered as a covariate in addition to early childhood overt aggression and negative emotional reactivity. The addition of sex reduced the significance of overt aggression such that only negative emotional reactivity was a significant covariate predicting group membership, $\chi^2(2, N = 317) = 6.51$, $p = .04$. In this instance, similar to results reported above, negative emotional reactivity was associated with higher odds of belonging to the borderline mood features class, $\beta = 1.34$, $t(313) = 2.31$, $p = .02$, OR = 3.59, 95% CI [1.21, 10.61] but was not significantly associated with odds of belonging to the conduct problem class over the comparison class, controlling for sex. Neither sex nor overt aggression was significantly associated with increased probability of belonging to conduct problem or borderline mood features classes, suggesting that there is shared variance between being male and showing

elevated overt aggression during early childhood in predicting the development of an adolescent conduct problem profile.

Finally, one additional analysis was undertaken to confirm the elevated levels of early overt aggression among youth in the adolescent conduct problem class and elevated levels of early negative emotional reactivity among youth in the adolescent borderline mood features class. For this analysis, the classification of individuals into one of three problem profile groups based on the highest posterior probabilities of LCA class membership was again utilized. ANOVAs were run in order to compare differences in levels of early childhood vulnerabilities across the three classes. The descriptive statistics comparing the three classes in these early childhood variables are summarized in Table 7 below. The three classes differed significantly in their levels of both overt aggression, $F(2, 314) = 4.30, p = .01$, and negative emotional reactivity, $F(2, 314) = 3.72, p = .03$. Post-hoc comparisons using the Tukey-Kramer test showed that adolescents in the conduct problems class had significantly higher overt aggression at school entry than those in the low-problem comparison class. Moreover, adolescents in the borderline mood features class had significantly higher negative emotional reactivity at school entry than those in the low-problem comparison class. Although youths in the conduct problems class had a higher level of overt aggression than those in the borderline mood features class, and youths in the borderline mood features class had a higher level of negative emotional reactivity than those in the conduct problems class, these differences were not statistically significant.

Table 7

Early Childhood Vulnerabilities Associated with Adolescent Classes

	Class		
	Low-Problem Comparison (<i>n</i> = 253)	Conduct Problems (<i>n</i> = 43)	Borderline Mood Features (<i>n</i> = 21)
Early childhood predictor			
Overt aggression	.58 (.47)	.80 (.52)*	.67 (.45)
Negative emotional reactivity	.24 (.79)	.44 (.65)	.66 (.66)*

Note. Adolescents were assigned to class based on the modal posterior probability. Asterisks indicate classes that differ from the low-problem comparison class, at the .05 significance level.

Moderation of Early Childhood Predictions by Adverse Social Experiences

It was hypothesized that adverse social experiences with peers (rejection) and parents (low parental warmth) would moderate the effects of early childhood vulnerabilities on late adolescent outcomes, with moderation amplifying the impact of early childhood vulnerabilities on problematic adolescent class membership. Moderation by peer rejection and low parental warmth of the link between early childhood vulnerabilities and late adolescent outcomes was examined using the `proc lca` procedure. Similar to the procedure used in multiple regression for testing moderation and in accordance with recommended statistical procedures (Wu & Zumbo, 2008), interaction terms were created by multiplying each early childhood predictor, which had been centered, with each moderator, creating four interaction terms in total (overt aggression x peer rejection, negative emotional reactivity x peer rejection, overt aggression x low parental warmth, and negative emotional reactivity x low parental warmth). Moderation was tested separately first for peer rejection and for low parental warmth, followed by analyses entering both moderators to compare the relative strength of each moderator.

Moderation by peer rejection experiences. To determine whether the chronicity of exposure to peer rejection amplified the link between early childhood vulnerabilities and problematic adolescent class membership, a categorical variable indicating the number of years a child experienced peer rejection (0 = Never; 1 = One year; 2 = Multiple years) was entered as a covariate in latent class analysis, along with the two interaction terms involving early childhood vulnerabilities (peer rejection x overt aggression, peer rejection x negative emotional reactivity). The results are summarized in Table 8.

The interaction term between negative emotional reactivity and peer rejection significantly improved the model fit, $\chi^2(2, N = 317) = 10.61, p = .01$, indicating support for the hypothesis that exposure to peer rejection significantly qualified the predictive relations between early childhood negative emotional reactivity and adolescent outcomes. In addition, the interaction term between overt aggression and peer rejection was marginally significant in terms of improving model fit, $\chi^2(2, N = 317) = 4.87, p = .09$, indicating possible support for the hypothesis that exposure to peer rejection qualified the predictive relations between early childhood overt aggression and adolescent outcomes.

Table 8

Odds of Class Membership Associated with Early Childhood Vulnerabilities and Peer Rejection

Covariate	Class				<i>p</i>
	Conduct problems		Borderline mood features		
	<i>OR</i>	95% CI	<i>OR</i>	95% CI	
Overt aggression	3.29	[0.85, 12.77]	4.59	[0.49, 42.80]	.10
Negative emotional reactivity	1.10	[0.46, 2.65]	0.82	[0.22, 3.07]	.91
Peer rejection	1.31	[0.81, 2.09]	0.39	[0.11, 1.42]	.14
Overt aggression x peer rejection	0.84	[0.26, 2.74]	0.16	[0.03, 0.85]	.09
Negative emotional reactivity x peer rejection	0.74	[0.34, 1.63]	11.12**	[2.03, 60.81]	.01

Note. $N = 317$. The p -values correspond to the chi-square test, $\chi^2(2, N = 317)$, of each covariate in changing the overall model fit. Other columns show the impact of each covariate on the odds of problem class membership, relative to membership in the low-problem comparison class.

** $p < .01$.

Next, to determine the nature of the impact that peer rejection had on the predictive link between early negative emotional reactivity and adolescent outcomes, the parameter estimates associated with predicted odds of problematic adolescent class membership were examined. The chronicity of a child's exposure to peer rejection did not affect the predictive links between child negative emotional reactivity and adolescent membership in the conduct problem class. However, peer rejection significantly amplified the probability that children with elevated negative emotional reactivity would be in the borderline mood features class rather than the low-problem class in late adolescence, $\beta = 2.41$, $t(311) = 2.78$, $p = .01$. The significant interaction

was graphed in order to illustrate the amplifying effect of exposure to peer rejection on the link between childhood negative emotionality and membership in the adolescent borderline mood features class (Figure 2), holding overt aggression constant at its mean. The graph shows negative emotional reactivity ranging from -1.5 to 1.5 standard deviations, because most of the sample fell within this range and thus the interaction was best interpreted within this range.

Figure 2. Probability of Membership in the Borderline Mood Features Class, by Negative Emotional Reactivity and Chronicity of Peer Rejection

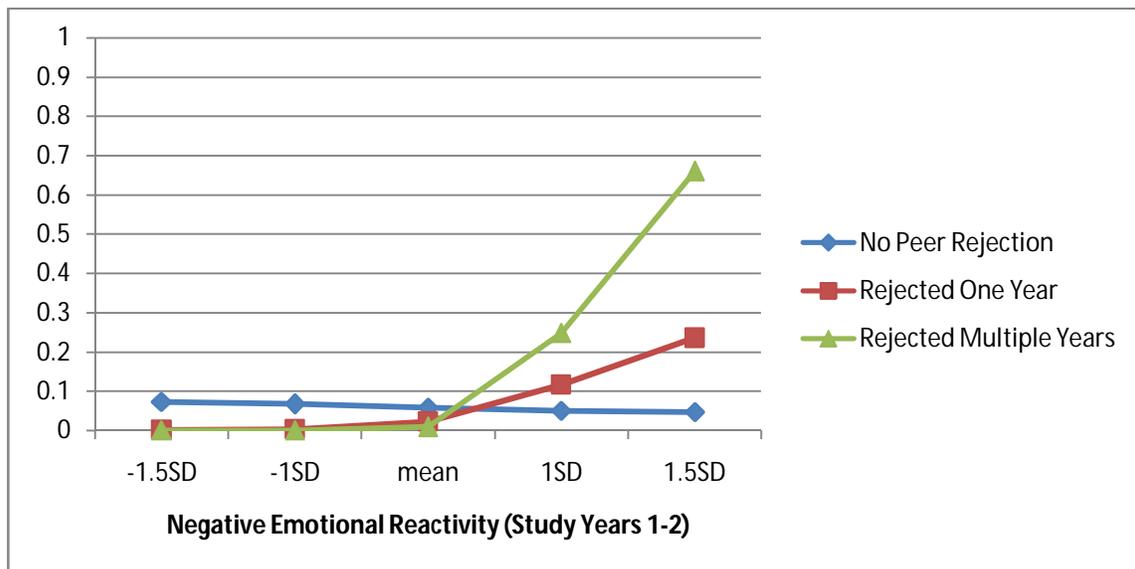


Figure 2. The graph shows the probability of membership in the borderline mood features class relative to the low-problem class, based on negative emotional reactivity and peer rejection.

The interaction between negative emotional reactivity and peer rejection experiences shows an effect when negative emotional reactivity is above the mean, with the probability of belonging in the borderline mood features class increasing at higher rates with greater negative emotional reactivity and more chronic experiences of peer rejection. Thus, the results support the hypothesis (Hypothesis 3b) that peer rejection experiences amplify the likelihood that

children with elevated levels of negative emotional reactivity at school entry will develop later borderline mood features. Secondary analyses showed that the results remained similar when peer rejection was entered as a continuous variable indicating the number of years peer rejected status had occurred.

Although the interaction between overt aggression and peer rejection experiences approached significance, this interaction term was not significant in predicting membership in either the conduct problems or the borderline mood features class. As such, the hypothesis that peer rejection moderates the relationship between overt aggression and later conduct problems (Hypothesis 3a) was not supported.

Moderation by low parental warmth. Moderation by low parental warmth of the link between early childhood vulnerabilities and adolescent outcomes was tested next. The main effect of exposure to low parental warmth and the two interaction terms (overt aggression x low parental warmth, negative emotional reactivity x low parental warmth) were included as covariates in latent class analysis. The results are summarized in Table 9.

The interaction term between negative emotional reactivity and low parental warmth significantly improved the model fit, $\chi^2(2, N = 317) = 7.42, p = .02$, indicating that exposure to low parental warmth significantly qualified the predictive relations between early childhood negative emotional reactivity and adolescent outcomes. A marginally significant trend also emerged for the main effect of low parental warmth experiences on adolescent problem profile membership, $\chi^2(2, N = 317) = 5.19, p = .07$. However, the interaction term between overt aggression and low parental warmth was not significant.

Table 9

Odds of Class Membership Associated with Early Childhood Vulnerabilities and Low Parental Warmth

Covariate	Class				<i>p</i>
	Conduct problems		Borderline mood features		
	<i>OR</i>	95% CI	<i>OR</i>	95% CI	
Overt aggression	3.14	[0.73, 13.47]	0.61	[0.08, 4.66]	.22
Negative emotional reactivity	0.93	[0.40, 2.14]	1.53	[0.52, 4.47]	.69
Low parental warmth	1.24	[0.76, 2.04]	0.29	[0.06, 1.27]	.07
Overt aggression x low parental warmth	0.96	[0.26, 3.58]	0.61	[0.05, 7.29]	.89
Negative emotional reactivity x low parental warmth	1.01	[0.39, 2.64]	12.53*	[1.47, 107.14]	.02

Note. $N = 317$. The p -values correspond to the chi-square test, $\chi^2(2, N = 317)$, of each covariate in changing the overall model fit. Other columns show the impact of each covariate on odds of problem class membership, relative to membership in the low-problem comparison class.

* $p < .05$.

Low parental warmth significantly amplified the predictive relation between early negative emotional reactivity and probability of membership in the adolescent borderline mood features class (in contrast to low-problem comparison class), $\beta = 2.53$, $t(311) = 2.31$, $p = .02$, but it did not significantly alter the predicted membership in the conduct problems class. The significant interaction between low parental warmth and negative emotional reactivity was graphed in order to illustrate the effect below (see Figure 3).

Figure 3. Probability of Membership in the Borderline Mood Features Class, by Negative Emotional Reactivity and Chronicity of Low Parental Warmth

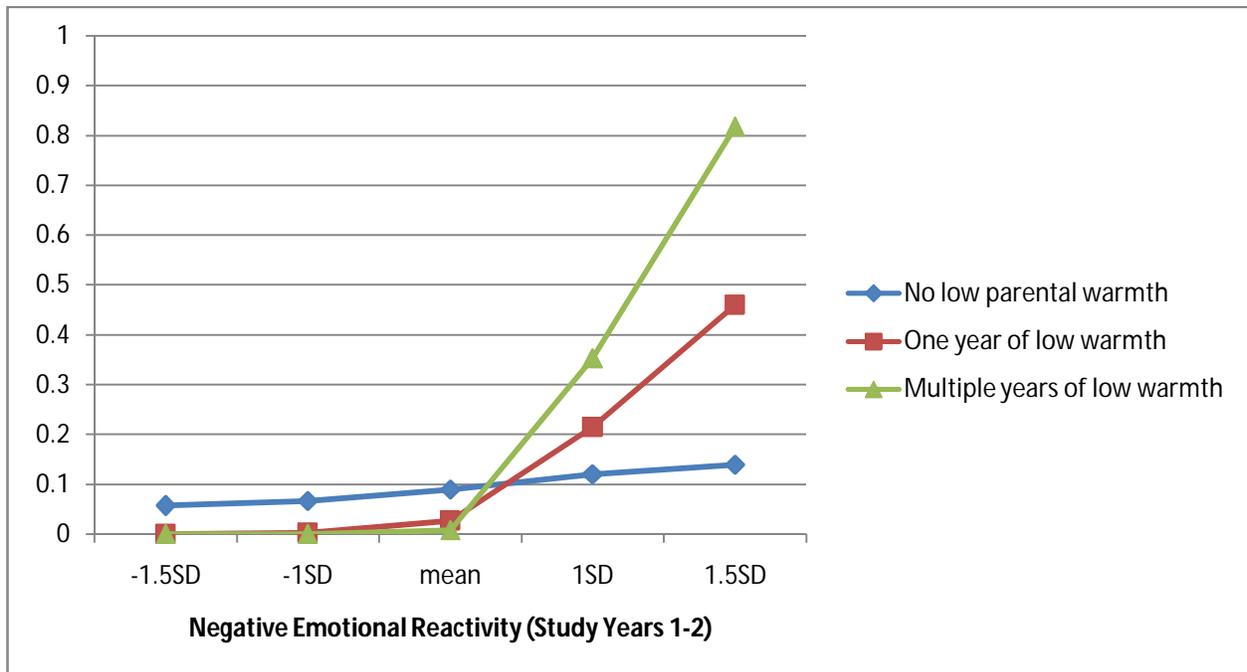


Figure 3. The graph shows the probability of membership in the borderline mood features class relative to the low-problem class, based on negative emotional reactivity and experiences of low parental warmth.

Similar to results with peer rejection, the interaction between negative emotional reactivity and low parental warmth had an effect when negative emotional reactivity was above average. When negative emotional reactivity was above average, experiencing more low parental warmth amplified the likelihood of membership in the borderline mood features class (relative to the low-problem comparison class). These findings support the hypothesis (Hypothesis 3d) that low parental warmth moderates and strengthens the link between negative emotional reactivity and adolescent borderline mood features. Secondary analyses showed that the results remained similar when low parental warmth was entered as a continuous variable indicating the number of years low parental warmth had occurred. In contrast, the interaction between overt aggression and low parental experiences was not significant. As such, the

hypothesis that low parental warmth moderates the relationship between overt aggression and later conduct problems (Hypothesis 3c) was not supported.

Moderation by multiple adverse social experiences. Finally, moderation by both types of adverse social experiences was examined simultaneously to allow comparison of the relative strength of each moderation effect. Because earlier results showed that peer rejection and low parental warmth each moderated the relationship between early negative emotional reactivity and late adolescent borderline mood features, but not the relationship between early overt aggression and adolescent outcomes, these analyses focused on the moderation of the relationship between negative emotional reactivity and borderline mood features.

First, to better understand the relationship between the two moderators, a cross-tabulation of the number of years the child experienced peer rejection and low parental warmth was examined (Table 10).

Table 10

Cross-Tabulation of Adverse Social Experiences in Grades 1-4

Low parental warmth	Peer rejection		
	Never	Once	Multiple Years
Never	75 (23.7%)	42 (13.2%)	33 (10.4%)
Once	49 (15.5%)	29 (9.1%)	31 (9.8%)
Multiple Years	19 (6.0%)	24 (7.6%)	15 (4.7%)

Note. $N = 317$. Proportion of the full sample is shown in parentheses. A chi-square test revealed no significant difference in the distribution of peer rejection and low parental warmth experiences.

As can be seen in the table above, there is great variability across the number of years peer rejection and low parental warmth were experienced by children between first and fourth

grades. In order to facilitate comparison of the relative impact these two types of adverse social experiences may have had in moderating the link between early negative emotional reactivity and adolescent borderline mood features, the impact of ever having experienced each type of adverse social events was first examined using dichotomous indicators (0 = never; 1 = any experience of the adverse social experience). The results are presented below in Table 11.

Table 11

Odds of Class Membership Associated with Early Childhood Vulnerabilities and the Presence of Adverse Social Experiences

Covariate	Class				
	Conduct problems		Borderline mood features		<i>p</i>
	<i>OR</i>	95% CI	<i>OR</i>	95% CI	
Overt aggression	3.07*	[1.19, 7.95]	0.25	[.04, 1.54]	.02
Negative emotional reactivity	1.40	[.52, 3.79]	1.16	[.37, 3.61]	.79
Presence of peer rejection	1.37	[.64, 2.94]	1.35	[.22, 8.47]	.69
Presence of low parental warmth	1.36	[.65, 2.87]	0.10	[.01, 1.54]	.17
Negative emotional reactivity x peer rejection	0.49	[.17, 1.41]	3.23	[.50, 20.71]	.15
Negative emotional reactivity x low parental warmth	0.92	[.33, 2.55]	30.46*	[1.54, 600.68]	.02

Note. $N = 317$. The p -values correspond to the chi-square test, $\chi^2(2, N = 317)$, of each covariate in changing the overall model fit. Other columns show the impact of each covariate on odds of problem class membership, relative to membership in the low-problem comparison class. Peer rejection and low parental warmth were coded as dichotomous variables indicating their presence or absence.

* $p < .05$.

The interaction term between negative emotional reactivity and the presence of low parental warmth significantly improved the model fit, $\chi^2(2, N = 317) = 8.05, p = .02$. Occurrence of low parental warmth significantly moderated the relationship between negative emotional reactivity and borderline mood features, $\beta = 3.42, t(310) = 2.25, p = .03$. In contrast, the interaction term between negative emotional reactivity and the presence of peer rejection was not significant, and thus the presence of peer rejection was not found to be a significant moderator when low parental warmth was included as a moderator in the same model. The interaction between negative emotional reactivity and both adverse experiences in predicting the probability of borderline mood features class is graphed below (Figure 4), with peer rejection (which was not significant) depicted in dotted lines to allow comparison.

Figure 4. Probability of Membership in the Borderline Mood Features Class, by Negative Emotional Reactivity and Presence of Low Parental Warmth and Peer Rejection

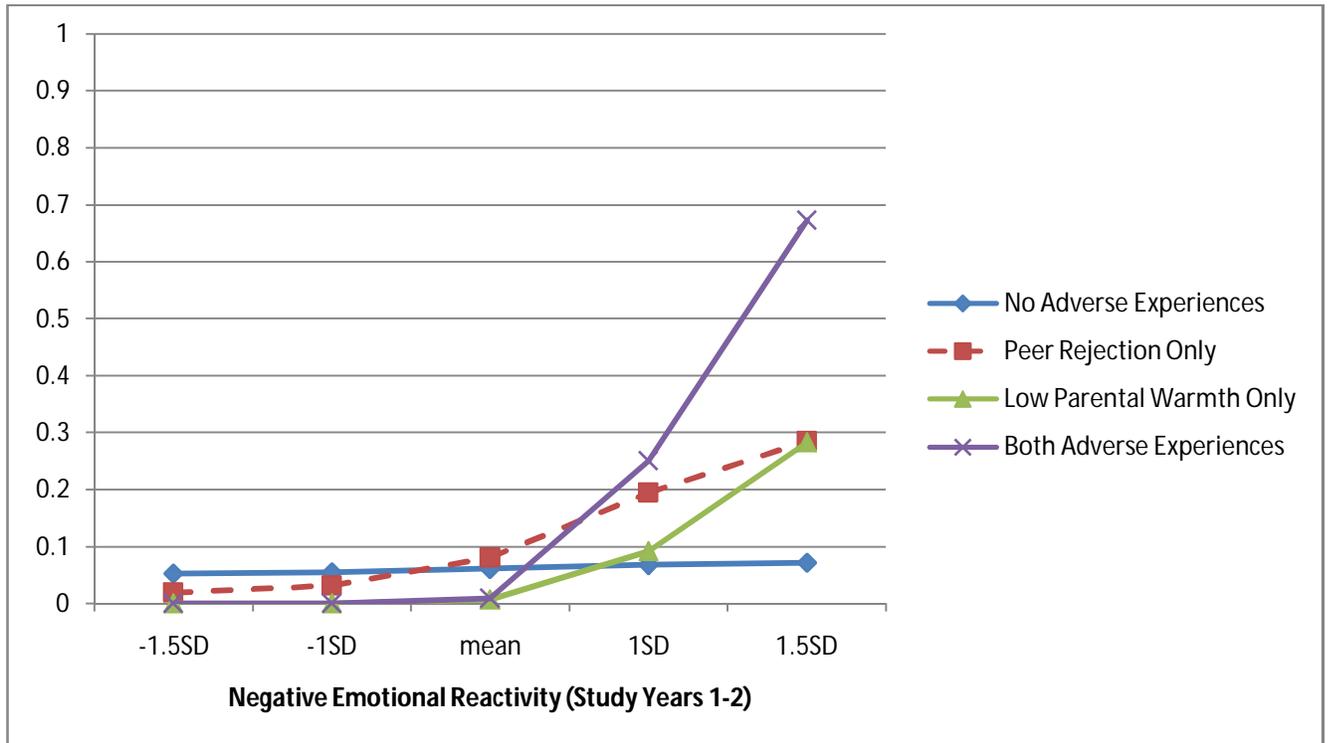


Figure 4. The graph shows the probability of membership in the borderline mood features class relative to the low-problem class, based on negative emotional reactivity and the presence of any low parental warmth or peer rejection experiences.

The graph in Figure 4 shows that the increase in the probability of belonging to the borderline features class increases more dramatically when low parental warmth is present, either alone or in the presence of peer rejection, compared to when peer rejection only is present or both adverse experiences are absent. On the whole, this analysis suggested that low parental warmth, either alone or in conjunction with peer rejection, significantly moderated the relationship between early childhood negative emotional reactivity and adolescent borderline mood features. Occurrence of peer rejection did not have a significant moderating effect.

Next, in order to examine whether the moderating effect of low parental warmth is still privileged once the chronicity of the adverse experiences was taken into account, a similar model was tested using the original moderator variables summarizing the number of years peer rejection and low parental warmth had occurred. The results are summarized in Table 12 below.

Table 12

Odds of Class Membership Associated with Early Childhood Vulnerabilities and Adverse Social Experiences

Covariate	Class				<i>p</i>
	Conduct problems		Borderline mood features		
	<i>OR</i>	95% CI	<i>OR</i>	95% CI	
Overt aggression	3.18*	[1.17, 8.61]	0.44	[.08, 2.41]	.03
Negative emotional reactivity	1.64	[.55, 4.85]	0.92	[.35, 2.42]	.68
Peer rejection experiences	1.28	[.79, 2.08]	0.81	[.26, 2.56]	.58
Low parental warmth experiences	1.22	[.75, 2.00]	0.34	[.07, 1.55]	.21
Negative emotional reactivity x peer rejection	0.54	[.25, 1.16]	2.53	[.65, 9.88]	.09
Negative emotional reactivity x low parental warmth	0.71	[.31, 1.66]	10.26*	[1.49, 70.53]	.05

Note. $N = 317$. The p -values correspond to the chi-square test, $\chi^2(2, N = 317)$, of each covariate in changing the overall model fit. Other columns show the impact of each covariate on odds of problem class membership, relative to membership in the low-problem comparison class.

* $p < .05$.

As before, the interaction between negative emotional reactivity and low parental warmth significantly improved model fit, $\chi^2(2, N = 317) = 5.96, p = .05$, and a trend emerged for the interaction between negative emotional reactivity and peer rejection to also improve model fit,

$\chi^2(2, N = 317) = 4.87, p = .09$. As before, the interaction between negative emotional reactivity and low parental warmth significantly moderated the relationship between negative emotional reactivity and borderline mood features, $\beta = 2.33, t(310) = 2.37, p = .02$. Other interaction terms were not significant in predicting either adolescent problem class. The significant interaction between low parental warmth and negative emotional reactivity in predicting membership in the borderline mood features class was graphed below (Figure 5), with the interaction in the presence of peer rejection (but in the absence of low parental warmth) depicted in dotted lines.

Figure 5. Probability of Membership in the Borderline Mood Features Class, by Negative Emotional Reactivity and Low Parental Warmth and/or Peer Rejection

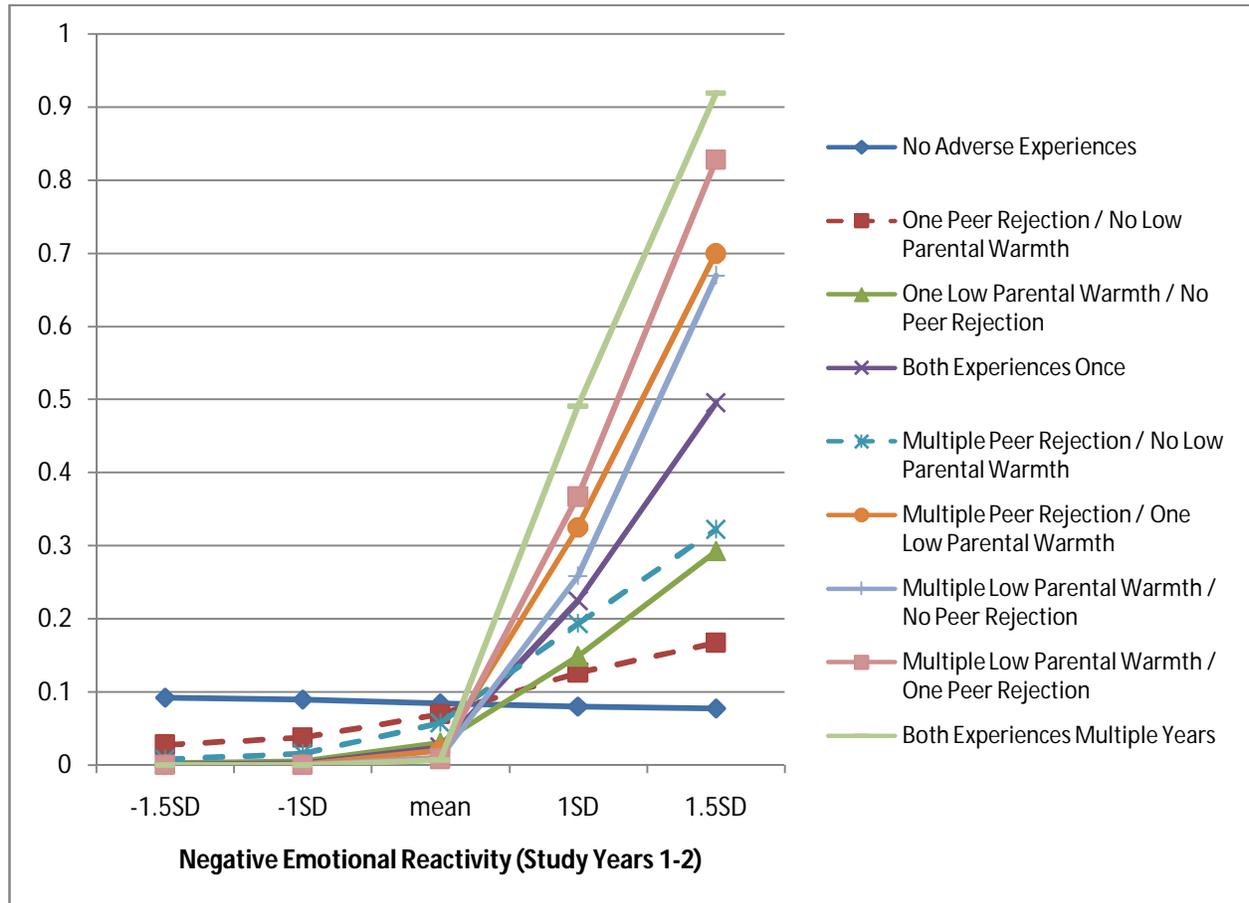


Figure 5. The graph shows the probability of membership in the borderline mood features class relative to the low-problem class, based on negative emotional reactivity and low parental warmth or peer rejection. Interactions without low parental warmth were not significant and were depicted using dotted lines.

In order to facilitate interpretation, the graph in Figure 5 was simplified by omitting the cases where low parental warmth was absent and by focusing on the negative emotional reactivity when it fell above the mean (Figure 6). As before, the graph focused on the range of negative emotional reactivity between its mean and 1.5 standard deviations above the mean.

Figure 6. Probability of Membership in the Borderline Mood Features Class, by Negative Emotional Reactivity and Adverse Social Experiences

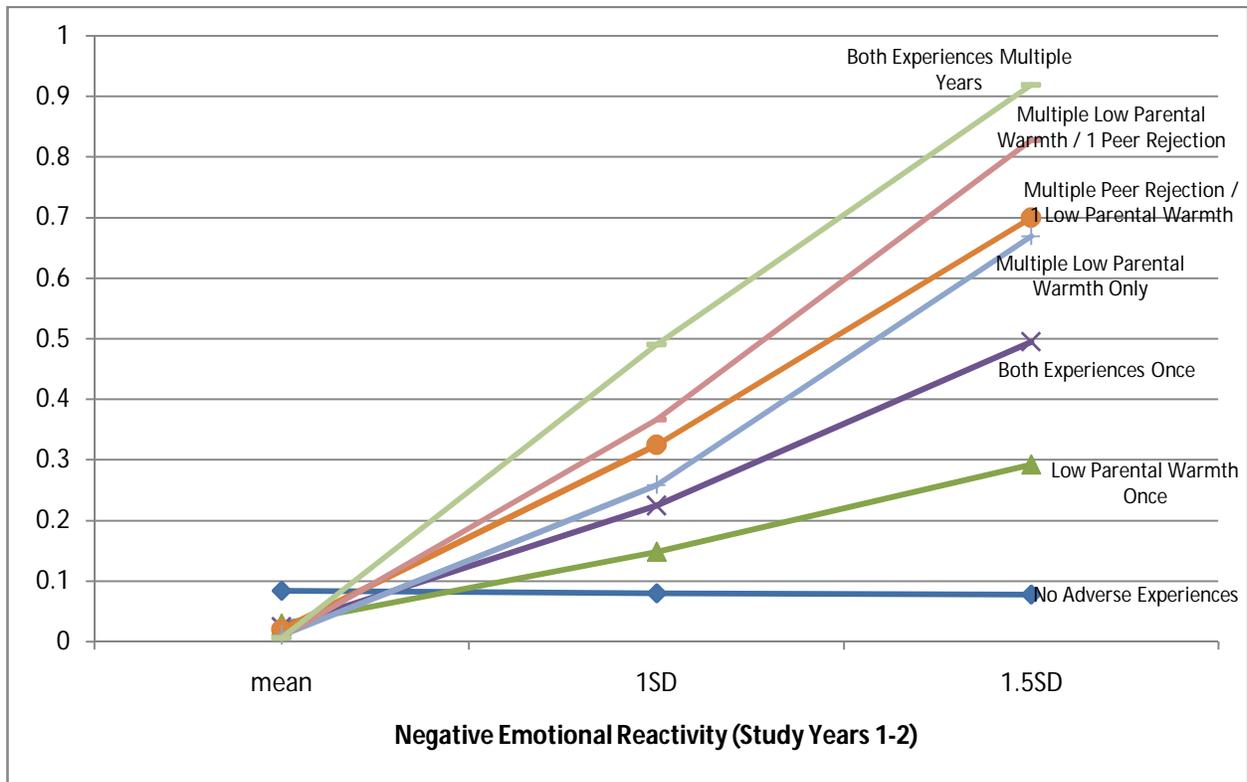


Figure 6. The graph shows the probability of membership in the borderline mood features class relative to the low-problem class, based on negative emotional reactivity and adverse social experiences. Only significant interactions are depicted for the range of negative emotional reactivity between mean and 1.5SD.

Figure 6 shows how the two types of adverse social experiences and their chronicity combine to increase the risk of borderline mood features in the presence of higher than average negative emotional reactivity. The effect appears to be cumulative, although each level of low parental warmth is privileged over the corresponding level of peer rejection, and peer rejection alone was not found to be a significant moderator and was consequently not depicted in isolation from low parental warmth. For children with higher than average negative emotional reactivity, the risk of belonging in the borderline mood features class is amplified more strongly with

greater frequency of adverse social experiences, be they low parental warmth or peer rejection, though low parental warmth is the primary, privileged, and significant moderator. Each occurrence of low parental warmth increases risk more than each occurrence of peer rejection, though peer rejection does add to risk when it occurs in addition to low parental warmth. As such, both adverse experiences appeared to contribute to increased risk of developing borderline mood features in late adolescence among children who showed above average levels of negative emotional reactivity at school entry, though each experience of low parental warmth conferred greater amount of risk than each experience of peer rejection. Secondary analyses showed that these results remained similar when peer rejection and low parental warmth were entered as continuous variables indicating the number of years these adverse experiences had occurred.

Impact of sex on models of moderation. Finally, to determine whether the moderation of adolescent outcomes by peer rejection or parental warmth was due to sex differences in the base rate of the predictors, sex was added in as a covariate in the LCA models testing moderation. Sex was not found to be a significant covariate and did not alter the findings for most of the models reported above. However, there was a slight impact of sex in the analysis examining moderation by both peer rejection and low parental warmth (see Table 13). As before, the results were similar when peer rejection and low parental warmth were entered as continuous variables.

Specifically, sex was a significant covariate, as being male was associated with a marginally significant increase in the odds of belonging to the conduct problem group rather than the low-problem comparison group, compared to females. With sex in the model, overt aggression no longer significantly improved model fit. The relationships among other covariates and the latent classes were similar to those previously presented, but controlling for sex resulted

in stronger interaction terms. With sex in the model, the interaction term between negative emotional reactivity and peer rejection significantly improved model fit, $\chi^2(2, N = 317) = 6.36, p = .04$, whereas it was a non-significant trend without sex in the model. However, the parameter estimates for this interaction were not significant in predicting specifically to either problem class. In addition, the parameter estimate for the interaction between negative emotional reactivity and low parental warmth was stronger after controlling for sex, $\beta = 2.36, t(309) = 2.62, p = .01$, for the prediction of the borderline mood features class, with an odds ratio of 10.59, which was slightly higher than that found without controlling for sex (10.26). Similar to prior analyses, the interaction between negative emotional reactivity and low parental warmth was not associated with odds of belonging to the conduct problem class relative to the low-problem comparison class. Overall, the pattern of findings was very similar whether or not sex was covaried in the model. As before, the results were similar when peer rejection and low parental warmth were entered as continuous variables.

Table 13

Odds of Class Membership Associated with Early Childhood Vulnerabilities and Adverse Social Experiences, Controlling for Sex

Covariate	Class				
	Conduct problems		Borderline mood features		<i>p</i>
	<i>OR</i>	95% CI	<i>OR</i>	95% CI	
Sex	3.04	[.98, 9.37]	0.44	[.14, 1.45]	.05
Overt aggression	2.24	[.81, 6.22]	0.71	[.16, 3.13]	.25
Negative emotional reactivity	1.93	[.69, 5.41]	0.85	[.27, 2.55]	.41
Peer rejection	1.30	[.79, 2.13]	0.83	[.27, 2.55]	.57
Low parental warmth	1.28	[.77, 2.13]	0.36	[.10, 1.36]	.15
Negative emotional reactivity x peer rejection	0.47	[.22, 1.03]	2.34	[.59, 9.22]	.04
Negative emotional reactivity x low parental warmth	0.67	[.29, 1.58]	10.59**	[1.82, 61.72]	.01

Note. $N = 317$. Sex was coded such that 0 = females; 1 = males. The p -values correspond to the chi-square test, $\chi^2(2, N = 317)$, of each covariate in changing the overall model fit. Other columns show the impact of each covariate on odds of problem class membership, relative to membership in the low-problem comparison class.

** $p < .01$.

Discussion

The present study sought to examine the development of conduct problems and borderline mood features, potential precursors to antisocial and borderline personality pathologies respectively, in a sample of children at risk due to elevated levels of aggressive-disruptive behaviors at school entry. The first aim of the study was to determine whether groups of youths who exhibited clusters of symptoms relevant to conduct problems and borderline mood features could be identified empirically in late adolescence. This aim was explored with latent class analysis, which revealed three distinct groups of adolescents. Consistent with the hypothesis, two of these groups had elevated problems. One problem group (15% of the sample) exhibited criminal behaviors and conduct disorder symptoms, reflecting difficulties associated with serious conduct problems, whereas the other problem group (7% of the sample) exhibited elevations in depressed mood, suicidality, and anger – a cluster of mood problems consistent with borderline mood features. These findings provide support for the hypothesis that children with elevated levels of aggressive-disruptive behaviors at school entry are at risk for developing two distinct patterns of adolescent difficulties, which are characterized primarily by antisocial conduct problems or by borderline mood features.

The second aim of the study was to examine whether specific early childhood vulnerabilities differentially predicted the two profiles of problematic late adolescent outcomes. As hypothesized, overt aggression in early childhood uniquely predicted the late adolescent profile with conduct problems and did not predict the profile with borderline mood features. Negative emotional reactivity in early childhood, on the other hand, uniquely predicted the profile with borderline mood features but did not predict the profile with conduct problems. These effects were present when overt aggression and negative emotional reactivity were

examined simultaneously. As such, these two early childhood vulnerabilities were found to be unique and specific risk factors for late adolescent outcomes. Neither overt aggression nor negative emotional reactivity emerged as general risk factors predicting to both types of later adolescent maladjustment.

The third aim of the study was to examine negative social experiences (peer rejection and low parental warmth) during middle childhood as potential moderators of the link between early childhood vulnerabilities and later adolescent outcomes. Both peer rejection and low parental warmth moderated the relationship between negative emotional reactivity in early childhood and later adolescent borderline mood features, amplifying the developmental risk of children with higher levels of negative emotional reactivity. The effects of both moderators appeared to be cumulative, with risk increasing dramatically with more years of peer rejection and low parental warmth experienced. However, comparisons of the moderating effects of these adverse social experiences indicated that low parental warmth appeared to have a stronger effect than peer rejection. Moreover, contrary to expectations, neither peer rejection nor low parental warmth moderated the link between overt aggression in early childhood and conduct problems in late adolescence.

Below, these findings will be discussed in the context of existing research. Clinical implications will then be discussed, followed by a review of the limitations of this study and suggestions for future directions in research.

Development of Conduct Problems

The Fast Track project was predicated on the assumption that children with high rates of aggressive-disruptive behaviors at school entry would be at elevated risk for the development of serious conduct problems by late adolescence. Consistent with this assumption, 15% of the

current, high-risk sample developed serious conduct problems in adolescence, reflected in youth- and parent-reported criminal behaviors, aggressive and antisocial conduct problems, and angry, oppositional behaviors – the defining features of conduct disorder (Bassarath, 2001; Loeber, Burke, & Pardini, 2009; Pardini, Frick, & Moffitt, 2010). Exploratory analyses showed that the levels of interpersonal violence, index offenses, and delinquent behaviors reported by these youths and their parents were significantly higher than those reported by youths in either of the other adolescent classes. Among the youths assigned to this class, a subset ($n = 19$; 46% of those in the class) met the full DSM-IV criteria for Conduct Disorder.

Overt aggression to conduct problems. Existing longitudinal research has suggested that elevated levels of overt aggression in childhood are linked to later conduct problems in adolescence (Coie & Dodge, 1998; Miller-Johnson et al., 1999; Moffitt, 1993). The current study also found this link in the Fast Track project sample. Teacher-rated overt aggression at school entry was associated with conduct problems 12 to 13 years later, and this link was present even after accounting for negative emotional reactivity, peer rejection, and low parental warmth experiences. Moreover, the adolescents assigned to the conduct problem class (based upon their highest probability of membership) had significantly higher levels of overt aggression at school entry than those assigned to either of the other classes. These findings are consistent with existing research indicating that children who show the highest levels of overt aggression in early childhood are at greatest risk for persisting in their trajectories and developing serious conduct problems later in life (Broidy et al., 2003; Moffitt et al., 2002; Nagin & Tremblay, 1999; Reef et al., 2010). This developmental continuity in aggression and externalizing problems includes homotypic continuity, as aggressive and antisocial behaviors sustain over time (Dandreaux & Frick, 2009; Eley et al., 2003), and also reflects heterotypic continuity, as the form of antisocial

behaviors changes and expands with age to include other norm-violating behaviors such as lying and theft (Coie & Dodge, 1998; Nagin & Tremblay, 1999). Even within the current sample, a group of children selected for elevated levels of early aggressive-disruptive behaviors, those with the highest levels of overt aggression at school entry were at highest risk for serious criminal and antisocial outcomes.

Beyond severity of initial aggression, the mechanisms that may operate to create this developmental continuity remain unclear in this study. Overall, the rates of adolescent conduct problems found in this study were lower than expected, given the high-risk nature of the sample and the usage of one standard deviation above the normative sample mean to classify elevations in symptoms. However, the high-risk nature of the current sample was reflected in the higher rates of elevated conduct problems found in this sample compared to the normative sample in Fast Track, as well as elevations in delinquent behaviors that are severe enough to be criminal offenses. Thus, although truncated and skewed distributions of index offenses and conduct problems resulted in fewer adolescents in the sample being classified as elevated in these symptoms, these adolescents showed more pervasive conduct problems and were most likely at highest risk for future antisocial personality pathology. In addition, attrition among some of the higher-risk children may have contributed some to the observed density of adolescents with elevated conduct problems, though distributional issues are more likely to be the main contributor.

Peer rejection and low parental warmth as moderators of risk. This study examined two possible moderators of early risk, which were negative social experiences of peer rejection and low parental warmth. The hypothesis that these negative social experiences would moderate the link between overt aggression and later conduct problems was not supported. This was

somewhat unexpected, as early genetic and behavioral vulnerabilities have been hypothesized to interact with negative socialization experiences and other environmental risk factors to increase risk for later conduct problems (for review and discussion, see W. A. Collins et al., 2000; Lahey et al., 1999; Raine, 2002). Although direct empirical tests of the interaction between aggressive behavioral problems and adverse social experiences are rare (Dodge & Pettit, 2003), one study of kindergarten students found a significant interaction between teacher-reported aggression and peer-nominated rejection in predicting continued aggression three years later (Dodge et al., 2003). Moreover, a significant interaction has been found in the Fast Track sample between high levels of externalizing problems at school entry and harsh parenting, characterized partly by low warmth, in predicting deviant peer associations in adolescence (Dodge et al., 2008). However, similar to the findings in the present study, this interaction was not found to be predictive of adolescent violence in late high school (Dodge et al., 2008). The absence of a significant interaction effect between childhood overt aggression and adverse social experiences in the present study may have resulted from its focus on the prediction of outcomes close to a decade after the occurrence of these adverse experiences rather than examining prediction within a shorter period of time. It may be that cascade processes occurring between middle childhood and adolescence, thus processes more proximal to late adolescent outcomes, account for the trajectory of children with high levels of overt aggression at school entry who go on to develop later conduct problems.

A number of studies have suggested that the negative long-term outcomes associated with early aggression reflect a negative cascade process, whereby early overt aggression evokes or produces adverse events such as peer rejection and harsh, coercive, or disengaged parenting (Coie et al., 1992; Crick, 1996; Lahey et al., 1999; Patterson & Bank, 1989), which in turn

contribute to limited access to social opportunities, potential involvement with deviant peers, and delinquency (Calkins & Keane, 2009; Campbell et al., 2000; Dodge et al., 2008; Dodge & Pettit, 2003; Ladd, 1999). One cascade model tested with a community sample of sixth graders found that peer rejection and behavioral problems in sixth grade predicted violent behaviors and offending in late adolescence through a specific pathway, which involved participation in gang activity in pre-adolescence, followed by peer deviancy training in mid-adolescence, which ultimately led to violent behaviors and offending in late adolescence (Dishion et al., 2010). These findings suggest that involvement with deviant peers during the transition to adolescence may be a key mechanism that links earlier aggression and resultant social difficulties to later violent offending, which may account for the exacerbation of norm-breaking behaviors found in children with externalizing problems, such as those in the present study.

Prior analyses of the Fast Track data have also provided support for negative cascade processes (Dodge et al., 2008) but with regards to low parental warmth. Consistent with a prior study linking low levels of maternal affection at kindergarten to increased aggression in early elementary school (McFadyen-Ketchum et al., 1996), low parental warmth and harsh parenting, assessed at the end of kindergarten, was significantly associated with later child outcomes, including social and cognitive deficits, later externalizing behaviors, and deviant peer association (Dodge et al., 2008). However, involvement with deviant peers in adolescence appeared to mediate the cascade effects leading from early low parental warmth and behavioral problems to violent behaviors and offending (Dodge et al., 2008). Thus, although there is support for the argument that low parental warmth exacerbates the stability and negative predictability of early aggression, for instance by reducing support for the development of self-regulation and effective social and conflict-resolution skills (Dodge & Pettit, 2003; Pettit et al., 1997; Pettit, Harrist,

Bates, & Dodge, 1991), or by contributing to a coercive cycle of punitive parenting that escalates the child's reliance on aggression to solve problems (Granic & Patterson, 2006; Patterson & Bank, 1989), these processes may comprise earlier processes in a longer cascade process leading to late adolescent outcomes. The recent cascade models of the development of conduct problems suggest that involvement with deviant peers in early adolescence may be a critical link between earlier risk, including overt aggression and subsequent social difficulties, and conduct problems in late adolescence.

Another unexpected result from the current study was that, although overt aggression at school entry was associated with peer rejection in middle childhood, overt aggression and low parental warmth were not significantly related. This may be due to the use of teacher ratings to assess childhood overt aggression in the current study. Teacher ratings reflect the child's behavior in the school context, where peer relations were also assessed, but those ratings may not correlate highly with aggressive behavior at home. A measure of child overt aggression exhibited at home (rather than school) might have been a stronger predictor of low parental warmth. In addition, neither peer rejection nor low parental warmth was correlated with later conduct problems or index offenses in the present study, nor did they significantly predict membership in the adolescent class characterized by serious conduct problems.

The findings in the present study also stand in contrast to other longitudinal studies that have found associations between peer-nominated rejection status and elevated risk for stable aggressive behaviors and conduct problems. For instance, in community samples, studies have found that fifth graders who were classified as peer-rejected based on peer nominations had significantly greater rates of truancy and police contact by age 18 compared to non-rejected children (Kupersmidt & Coie, 1990). Similarly, peer-rated rejection in middle childhood has

been found to predict greater self-reported and teacher-reported conduct problems and court offenses by ninth grade (Ollendick et al., 1992) as well as minor theft and felony assault in boys and minor assault in girls in grades 6-10 (Miller-Johnson et al., 1999). However, these and other studies examining links between peer rejection and later aggressive behavior have typically focused on predictive correlations over shorter periods of time compared to the period examined in this study (kindergarten to the year after 12th grade). Moreover, the samples studied in prior studies have typically been representative and not focused on children with externalizing problems. These distinctions may partially account for the discrepancy in findings between these prior studies and the present study.

One possible explanation for the current findings is that peer rejection and low parental warmth experienced in childhood may play a greater role in promoting continuity in interpersonal conflict and aggression but may not promote the development of serious index offenses and antisocial behavior into late adolescence, especially in the absence of key risk factors in more proximal periods (e.g., engagement with deviant peers, academic failure). However, another potential explanation is that early elevations in externalizing problems may be a strong direct predictor of later serious conduct problems, which is a conceptualization consistent with findings from several longitudinal studies (Broidy et al., 2003; Reef et al., 2010). Indeed, significant correlations were found between early overt aggression and index offenses as well as conduct disorder symptoms in late adolescence. Especially for children with highest levels of externalizing problems, the risk posed by mechanisms underlying early overt aggression may be high enough that these children continue to aggress and add repertoire to their norm-violating behaviors over time without adequate protective factors (e.g., development of social, emotional, and academic skills promoting successful engagement with peers and in

school) or intervention, irregardless of other risk factors (e.g., peer rejection, low parental warmth).

Development of Borderline Mood Features

The smallest cluster of adolescents (7% of the sample) exhibited elevations in depressed mood, suicidality, and angry, oppositional behaviors, and this prevalence is similar to those of borderline personality disorder found in longitudinal studies, estimated at approximately 6% to 8% in young adults (Bernstein et al., 1993) and approximately 6% in adults (Grant et al., 2008). Many of the youths who belonged to this group (assigned based on highest probability of membership) met full DSM-IV criteria for Major Depressive Disorder (10 out of 18 adolescents in the sample who met criteria; 56%). In contrast, very few of the youths who met the DSM-IV criteria for Major Depressive Disorder were assigned to other classes ($n = 3$ in the conduct-disordered class and $n = 5$ in the low-problem comparison class). Additionally, the borderline mood features group included the highest density of adolescents who met full DSM-IV criteria for Oppositional Defiant Disorder (10 out of 31; 32%). This rate is higher than the rate of ODD diagnosis among children in the conduct problem class ($n = 11$, 27% of the class) or among children in the low-problem comparison class ($n = 10$, 4% of the class). Thus, the borderline mood features class appears to have the highest density of adolescents with severe mood problems as well as angry, oppositional behavioral problems. This combination of severe internalizing and externalizing tendencies is consistent with the general conceptualization of borderline personality pathology and its mood features, including a combination of chronic, severe dysphoria, intense anger, and self-harming behaviors (Beauchaine et al., 2009; Paris, 2005; Skodol et al., 2002). Moreover, the present findings are consistent with models that distinguish borderline pathology from depression by the degree of intense, volatile,

inappropriate, and/or reactive anger, which are considered characteristic of borderline mood pathology (Gunderson & Phillips, 1991; Koenigsberg et al., 2002; A. L. Miller et al., 2008).

Negative emotional reactivity to borderline mood features. Negative emotional reactivity at school entry emerged as a predictor of borderline mood features in late adolescence. This finding is consistent with etiological theories of borderline personality pathology that view negative emotional reactivity, or affective dysregulation more generally, as a key component of borderline pathology. The pivotal role of emotion regulation problems has been acknowledged by numerous etiological theories, including attachment theory (Fonagy & Bateman, 2007; Fonagy et al., 2000; Levy, 2005; Lyons-Ruth & Spielman, 2004), organizational theory of development (Carlson et al., 2009), and emotion theory (Putnam & Silk, 2005). Problems with emotion regulation have also been emphasized by developmental psychopathology researchers examining biological vulnerabilities that underlie borderline pathology (e.g., Beauchaine et al., 2009; Gratz et al., 2009). In the present study, because negative emotional reactivity was measured at school entry, the extent to which it reflected an inherent, temperamental vulnerability (Caspi et al., 1995; Rothbart & Bates, 2006; Scaramella & Conger, 2003) or was an artifact of relational dysfunction, especially in the parent-child relationship (Calkins, 2004; Carlson et al., 2009; Keenan, 2000; Shields et al., 2001), cannot be disentangled. However, the predictive value of negative emotional reactivity was evident while controlling for early childhood overt aggression. Interestingly, although negative emotional reactivity has been conceptualized as a general risk factor for both externalizing and internalizing problems (Campbell et al., 2000; A. L. Hill et al., 2006; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003; Oland & Shaw, 2005), it did not predict serious conduct problems and criminal activity in the present study.

The present study is one of the first studies to examine the development of borderline personality pathology using prospective longitudinal data from childhood and adolescence, which only a few studies have done thus far. Moreover, the findings from the present study may help address some discrepancies in this nascent literature. Although prior studies have found longitudinal links between negative emotional reactivity or related constructs to later borderline pathology, they have disagreed as to whether negative emotional reactivity is an independent predictor of later borderline pathology. For instance, Carlson et al. (2009) found that negative emotionality at 30 months was significantly correlated with borderline personality disorder symptoms at age 28 but did not independently predict these symptoms. Another short-term longitudinal study spanning one year in late elementary school also found that emotional sensitivity was associated with the level of and change in borderline personality features, though again, emotional sensitivity did not significantly predict the features after accounting for depressive symptoms, friend exclusivity, cognitive sensitivity, and relational aggression (Crick et al., 2005). In contrast, Crawford et al. (2009) found that angry temperament in childhood was a significant, unique predictor of BPD symptoms in early adulthood, even after taking into account other risk factors such as early separation from mother, crying/demanding temperament in childhood, maltreatment, and adolescent attachment.

However, none of these studies has examined the interaction between early emotional vulnerability and environmental stressors. The present study contributed this perspective to the literature and found that, not only is early childhood negative emotional reactivity a significant risk factor useful for predicting borderline mood features in late adolescence, but it interacted significantly with negative social stressors such as rejection by peers and low affection from parents to increase risk for future borderline pathology. Thus, examining the interaction between

early emotional vulnerabilities and negative social experiences may be useful in illuminating how the impact of negative emotional reactivity on the development of later borderline pathology may vary, depending on levels of negative emotional reactivity and the presence and severity of other risk factors.

Moderation by peer rejection. The link between negative emotional reactivity in early childhood and borderline mood features in late adolescence was amplified by adverse social experiences occurring in middle childhood, specifically peer rejection and low parental warmth. Moreover, the interaction between negative emotional reactivity and adverse social experiences appeared to be a stronger predictor of borderline pathology than either factor alone. This finding is consistent with diathesis-stress or differential susceptibility models of borderline pathology, suggesting that both affective vulnerability (negative emotional reactivity) and adverse social experiences play crucial roles in producing pathology (e.g., Beauchaine et al., 2009; Crowell et al., 2009; Fruzzetti et al., 2005; Joyce et al., 2003).

In the present study, peer rejection significantly amplified the relationship between negative emotional reactivity in early childhood and late adolescent borderline mood features, and this effect was particularly strong for children with highest levels of negative emotional reactivity. This is a relatively new contribution to the literature on the etiology of borderline personality pathology, because interpersonal difficulties and rejection experienced with peers are not yet well explored as risk factors for the emergence of borderline pathology. In adulthood, clinician ratings suggest that individuals with BPD evidence the worst quality of peer relationships and the fewest number of close relationships compared to patients with other personality disorders or those without any personality disorder (Wilkinson-Ryan & Westen, 2000). However, the relative roles that emotional dysregulation and negative peer experiences in

childhood play in developing borderline pathology are not well-studied. There is surprisingly little research in this area, though researchers have considered social difficulties with peers to be a potential marker of borderline pathology that is identifiable during childhood (Bemporad, Smith, Hanson, & Cicchetti, 1982; Rogosch & Cicchetti, 2005).

Existing research on peer rejection supports the idea that negative emotional reactivity increases a child's risk of peer rejection (Bierman, 2004; Bierman et al., 1993; Pope & Bierman, 1999). A unique and important contribution of this study is the assessment of peer rejection with sociometric nominations, which provide direct and valid assessment of the child's peer experiences, across multiple years in middle childhood and examining its predictive utility for borderline pathology. Prior studies have examined difficulties getting along with peers and experiences of peer rejection cross-sectionally, documenting links between peer ratings of a child's tendency to upset others, commit relational aggression, and be disliked, and symptoms of borderline pathology in children (e.g., self-harm, emotional negativity/lability, relational conflicts; Rogosch & Cicchetti, 2005). Furthermore, in middle childhood, low social preference among peers and teacher-rated peer rejection have been found to be associated with negative, constricted, and disorganized representations of caregivers and others, which pose significant risk for borderline pathology (Rudolph, Hammen, & Burge, 1995; Shields et al., 2001). The prospective, longitudinal design of the present study extends and validates the findings of these cross-sectional studies, documenting significant long-term developmental links. The finding that peer rejection amplified the risk associated with negative emotional reactivity suggests that the experience of exclusion, disaffection, and dislike by peers plays an important role in developing borderline pathology. It is possible that children with high negative emotional reactivity are

especially susceptible to the stress caused by peer rejection or experience persistent ill effects associated with the unavailability of peer support and positive peer socialization opportunities.

Moderation by low parental warmth. In addition, low parental warmth in middle childhood was also found to significantly amplify the effect of early negative emotional reactivity on development of borderline mood features, and this amplification was especially strong for children with highest levels of negative emotional reactivity. This finding is consistent with the view that that problems in parenting, including low warmth, significantly increase risk for future affective pathology due to the absence of affectively warm responding that assist in the development of emotion regulation (Eisenberg et al., 2010; Maccoby, 1980). Similarly, the finding is consistent with prior studies that have emphasized the key role played by psychosocial stressors in the familial environment, including within the parent-child relationship, in increasing risk of emotional dysregulation and borderline pathology (e.g., Cohen et al., 2005; Crowell et al., 2009; Joyce et al., 2003; Rogosch & Cicchetti, 2005). In addition, the current study adds to existing research on the link between low parental warmth and risk for future psychopathology characterized by the co-occurrence of externalizing and internalizing problems (Ge et al., 1996; Kim et al., 2003; Oland & Shaw, 2005) as well as interpersonal risk, such as negative attribution style and poor social skills (Lamborn et al., 1991; Muris et al., 2001; Sentse, 2009). The present study extended these literatures by examining stressful experiences with parents as a moderator and finding that the risk posed by low parental warmth for the development of borderline pathology was especially strong for children with elevated negative emotional reactivity.

Moreover, the present study adds to the nascent literature of prospective, longitudinal studies examining the link between parenting and the development of borderline pathology. One

such study, based on the Harvard Family Pathways Project (Lyons-Ruth, Connell, Grunebaum, Botein, & Zoll, 1984), examined parent-child interactions during infancy and found that withdrawn maternal behaviors such as failing to initiate interaction or not greeting the infant after a separation predicted the child's borderline symptoms in late adolescence (Lyons-Ruth, 2006, 2008). The present study finding that low parental warmth in middle childhood exacerbated the impact of negative emotional reactivity on future borderline mood features may be an extension of Lyons-Ruth's work, providing a way to explain how the risk posed by withdrawn parenting is maintained during childhood. Withdrawn maternal behaviors during infancy may contribute to the child's tendency to experience emotional distress and dysregulation due to the absence of supportive, responsive maternal behaviors that foster emotion regulation (Cole et al., 1994; Tronick, 1989). The child's tendency to be emotionally dysregulated and the parent's low affective and supportive involvement may reinforce each other to maintain the child on a trajectory towards future pathology characterized by affective problems, as found in the present study.

In addition, other prospective studies have found a link between lack of positive affective involvement with the child early in the child's life and the development of dissociative symptoms in late adolescence (Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009; Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997). This link is also significant because dissociation is considered an important marker of borderline pathology, possibly arising from difficulties organizing one's experience when exposed to affectively overwhelming stressors (Korzekwa, Dell, & Pain, 2009). The findings in these prior studies suggest that other aspects of borderline pathology, including dissociation and difficulties organizing stressful interpersonal experiences, may also emerge as a result of parenting characterized by low warmth.

In sum, the evidence revealed here of the long-term predictability of low parental warmth and its moderation of early negative emotional reactivity adds to the literature in important ways and suggests that transactional processes may occur over time. Low parental warmth may both contribute to and escalate the development of the child's negative emotional reactivity throughout childhood and adolescence (Carlson et al., 2009; Eisenberg et al., 1998; Morris et al., 2007; Shields et al., 2001). Conversely, low parental warmth may reflect a parent's disengaged or frustrated response to a child prone to dysregulated negative emotions (Cole et al., 2009). Transactions between the emotionally dysregulated child and the detached, uninvolved parent may increase the risk of maltreatment, parent-child conflict, and other interpersonal difficulties that in turn increase risk for future borderline pathology, including anger, suicidality, and depressed mood (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Rogosch & Cicchetti, 2005; Westen, Ludolph, Misle, Ruffins, & Block, 1990; Widom, Czaja, & Paris, 2009).

Low parental warmth as a stronger moderator than peer rejection. Interestingly, low parental warmth was found to be a stronger moderator of the link between negative emotional reactivity and later borderline mood features than peer rejection. This finding is consistent with etiological models of BPD that emphasize the quality of parenting and the parent-child relationship, typically in the first years of life, as setting the tone for and contributing to future interpersonal dysfunction associated with borderline personality pathology (e.g., Carlson et al., 2009; Fonagy & Bateman, 2007; Hesse & Main, 2006; Kernberg, 1975; Levy, 2005; Lyons-Ruth & Spielman, 2004). Moreover, as discussed above, low parental warmth may contribute to child emotion dysregulation and reactivity, which in turn increases the risk of peer rejection. As such, low parental warmth may significantly account for the mechanism by which negative emotional reactivity and peer rejection interact in increasing the risk of later borderline mood features.

Moreover, the current finding is consistent with other studies finding that parents may be privileged over peers in influencing the development of maladjustment relevant to borderline pathology. For instance, a longitudinal study of a birth cohort found that maternal responsiveness in the first nine years of the child's life, operationalized as providing positive, warm emotional responses, negatively predicted difficulties with peers at age 9, which were associated with delinquency and suicidal behaviors between ages 16 to 18 (Woodward & Fergusson, 1999). Moreover, perceived parental rejection characterized by hostility, coercion, derogation, and blaming behaviors reported in preadolescence has been found to predict internalizing and externalizing behavioral problems more strongly than peer rejection or acceptance, approximately two years later (Sentse, 2009). Thus, low parental warmth may not only set the stage for social difficulties with peers but also maintain these difficulties and the child's dysregulation by failing to provide an alternate source of emotional support.

Conversely, the availability of warm and involved parental support may buffer a child from the impact of poor peer relations. For instance, parental support reduces the impact of peer victimization on adolescent mental health adjustment (Stadler, Feifel, Rohrman, Vermeiren, & Poustka, 2010), and perceived maternal emotional support reduces the link between peer victimization and emotional/behavioral problems (Yeung & Leadbeater, 2010). The absence of such protection may also serve to maintain or even worsen the child's maladjustment, especially among children with elevated negative emotional reactivity. In sum, there is theoretical and empirical work consistent with the present study finding that low parental warmth may be a stronger predictor of child maladjustment in children at risk for borderline pathology than peer rejection.

Distinctiveness of the Conduct Problem and Borderline Mood Features Classes

Prior research has found that Conduct Disorder and Major Depressive Disorder co-occur at levels above what would be expected by chance (Compton, Snyder, Schrepferman, Bank, & Shortt, 2003; Loeber & Keenan, 1994; O'Connor, McGuire, Reiss, Hetherington, & Plomin, 1998; Tillfors, El-Khoury, Stein, & Trost, 2009). Moreover, conduct problems and antisocial behaviors have been linked to increased suicidal behaviors (Harrington, 2001; Stein, Apter, Ratzoni, Har-Even, & Avidan, 1998; Verona, Patrick, & Joiner, 2001). However, in the present study, the class of adolescents with serious conduct disorder symptoms was distinct from another class of adolescents with depressed mood and suicidality. Thus, a class with comorbid conduct problems and borderline mood problems did not emerge.

It is possible that this lack of overlap reflects a limitation of the methodology used to assess symptoms in late adolescence. In general, rates of symptoms reported by youth and parents on the DISC interview were quite low. In this large sample of high-risk youth, only two (0.7%) adolescents in the sample met DSM-IV criteria for both CD and MDD. Because meeting full DSM criteria for either disorder indicates the most severe pathology, it is possible that there are more adolescents with sub-clinical but elevated levels of co-morbid conduct problems and borderline mood features. However, they were not detected with the measurement methods used in this study, likely because there were very few adolescents in the current sample who showed elevations in both conduct and mood problems.

Divergence in pathways towards conduct problems and borderline mood features.

In early childhood, however, teacher ratings indicated strong associations between overt aggression and negative emotional reactivity in the present sample, consistent with the selection of the sample for elevations in aggressive, disruptive, and/or oppositional behavior problems at

school entry. The association between these vulnerabilities is consistent with existing research suggesting that emotional dysregulation often accompanies aggressive behaviors in early childhood (Denham et al., 2002) and may reflect neurobiological and neurochemical problems underlying conduct disorder (Cappadocia et al., 2009). Moreover, the co-occurrence of overt aggression and negative emotional reactivity in early childhood is consistent with research suggesting that children at risk for future conduct problems show a combination of emotional and behavioral dysregulation, characterized by undercontrolled, disinhibited, irritable/difficult, oppositional, and/or fearless temperament early in life (Caspi, 2000; Caspi et al., 1995; Clark, 2005; Farrington, 2005; Kasen et al., 1996; Loeber & Hay, 1997). Existing research also suggests that emotion dysregulation in childhood increases risk for future conduct disorder as well (Caspi et al., 1995; Cole et al., 2003; Zahn-Waxler et al., 2008).

However, existing studies have rarely examined the unique prediction by overt aggression and emotional dysregulation to profiles of problem behaviors in adolescence in a manner parallel to the present study methodology. In the present study, a small but significant correlation emerged between negative emotion reactivity in early childhood and late adolescent index offenses, parallel to the predictive links found in other studies. However, when adolescents were classified into distinct, latent problem profiles, and prediction to these profiles by negative emotional reactivity and overt aggression were examined together, greater differentiation emerged.

Children who evidence both overt aggression and negative emotional reactivity may still continue on to develop a future profile of problems that is dominated by conduct problems and criminal activities, with anger turned outward against others rather than anger turned towards oneself in a manner consistent with borderline mood features. This interpretation of the present

findings is consistent with data presented by Sheidow et al. (2008) who found that, among children whose conduct problems are chronic instead of escalating from less severe problems, internalizing symptoms tended to decrease over the course of adolescence. Conversely, children with more moderate levels of overt aggression but high rates of negative emotionality may more often develop patterns of oppositional and argumentative interpersonal behaviors and high levels of distress but not escalate into criminal activity. In other words, one group of children with high levels of overt aggression and possibly co-occurring negative emotional reactivity followed a predominantly externalizing trajectory characterized by acting out against others and violating norms. Another group of children with high levels of negative emotional reactivity, possibly with co-occurring overt aggression, followed a more internalizing trajectory amplified by social difficulties and leading towards a combination of severe internalizing mood symptoms and anger.

The findings from the present study suggest that the pathways to conduct problems and to borderline mood features may diverge early, as early childhood vulnerabilities were found to specifically predict to each outcome. This divergence may be attributed to the underlying mechanisms producing overt aggression and negative emotional reactivity in early childhood that become amplified during the period from childhood to adolescence. For instance, overt aggression may occur as a result of temperamental vulnerabilities, including low effortful control and high negative emotional reactivity characterized predominantly by frustration or anger (Frick & Morris, 2004). The inherent tendency to externalize frustration and act impulsively may elicit parental responses that are hostile or coercive, which serve to escalate the child's aggressive behaviors (Patterson et al., 1989) that are then observed at school entry and ultimately

maintained via negative cascade processes (e.g., social and academic maladjustment, involvement with antisocial peers, deviancy training) described above.

On the other hand, another group of children with high negative emotional reactivity and aggression may tend to have emotional reactions that lead to not only externalizing (anger, frustration) but also internalizing (anxious, sad, withdrawn) features. Although this combination of aggression and negative emotional reactivity may be attributed to temperamental vulnerabilities such as low effortful regulation and negative emotionality characterized by both sadness and anger (Eisenberg et al., 2001), this mixture of externalizing and internalizing problems may also reflect insecure or disorganized attachment experiences with caregivers in the earliest years of a child's life. As discussed above, attachment experiences that lack consistent, warm, and responsive parental responses to the child may interfere with the development of effective emotion regulation capacities as well as stable, secure, and coherent sense of self and others (Fonagy & Bateman, 2007; Hesse & Main, 2006; Kernberg, 1975; Levy, 2005; Lyons-Ruth & Spielman, 2004). The resulting lack of access to effective organizational strategies for managing one's emotional experiences and interpersonal relationships may give rise to a combination of emotionally reactive and angry responding to perceived interpersonal threats, reflecting borderline mood pathology (Gunderson & Phillips, 1991). It is possible that children in the present sample who were aggressive and emotionally reactive are expressing this pattern.

Thus, one potential explanation for the divergence among aggressive-disruptive children who go on to develop conduct problems and those who develop later borderline mood features is that the former group may be dysregulated as a result of temperamental vulnerabilities characterized by tendencies to be impulsive and angry, which may be reinforced by harsh or coercive parenting, maintaining an externalizing and aggressive trajectory for the child. The

latter group of children who may instead be dysregulated as a result of poor attachment experiences earlier in life, possibly in conjunction with a temperamental tendency to experience fear or sadness in addition to frustration, may experience a trajectory characterized by mixed internalizing and externalizing problems as well as dysregulation and disorganization in interpersonal relationships. These potential mechanisms underlying overt aggression and negative emotional reactivity at school entry may help account for how these behavioral vulnerabilities predict differentially to adolescent outcomes.

Sex differences. Another possible explanation for the divergence in pathways among the children in the sample is that sex differences in socialization experiences encourage an aggressive and delinquent trajectory for boys and a more mixed, internalizing and angry trajectory for girls. Aggressive behavior in boys may be viewed by parents and peers as more acceptable than aggressive behaviors in girls (Zahn-Waxler & Polanichka, 2004). Parental support for fighting as a way to resolve conflict has been found at higher rates and was more strongly associated with physical aggression in boys compared to girls, whereas higher rates of parental support for non-violent solutions to conflict have been found in girls than boys (Farrell, Henry, Mays, & Schoeny, 2011). Moreover, girls who aggress are more likely than aggressive boys to experience unfavorable responses from peers, potentially because aggression in girls violates social norms more than aggression in boys (Miller-Johnson et al., 2002). These socialization influences may encourage aggressive boys to remain aggressive, whereas they may discourage aggressive girls from doing so.

Furthermore, the child's reactions to peer rejection may also differ by gender, as boys have been found to respond to rejection with greater increase in aggressive (DeRosier et al., 1994; Zakriski et al., 2005) and antisocial behaviors (Lewin et al., 1999) compared to girls.

Moreover, a study comparing the impact of rejection on externalizing and internalizing problems found that boys with higher rejection sensitivity experienced greater externalizing problems in response to rejection, whereas girls with higher rejection sensitivity were less prone to develop externalizing problems (Sandstrom et al., 2003). This may mean that, while aggressive boys are prone to develop further externalizing behavioral problems in response to peer rejection, the adverse impact of peer rejection for aggressive girls may lead them more towards internalizing or mixed internalizing and externalizing problems. Some support for this view has been found. For example, stressful experiences with peers have been found associated with higher levels of depression and anxiety in girls than boys (Rudolph, 2002), suggesting that girls may be more likely than boys to internalize their distress when experiencing peer rejection. Moreover, being liked by peers in elementary school was inversely associated with internalizing and mixed internalizing/externalizing problems two years later in a community sample of girls (Kupersmidt & Patterson, 1991). This may mean that aggressive girls, who may be less liked by peers, are at higher risk for developing internalizing and comorbid internalizing/externalizing problems than more well-liked counterparts. Thus, sex differences in responses to peer rejection may contribute to the divergence in pathways between aggressive-disruptive boys and girls.

Moreover, sex differences in reactions to low parental warmth may also account for different outcomes found in boys and girls. For instance, perceived parental rejection reported in pre-adolescence has been found to predict higher internalizing problems two years later, but this effect has been found only in girls and not boys (Sentse, 2009). Moreover, parenting characterized by harshness, low warmth, and inconsistency experienced in early childhood was linked to later social and academic difficulties among at-risk girls, whereas such parenting was not linked to the adverse outcomes for boys (Dodge et al., 2008). Thus, girls may be more

susceptible to parental rejection than boys and may be more likely to develop internalizing mood problems when experiencing low parental warmth. This sex difference may account for the impact of low parental warmth on the development of borderline mood features among children with higher negative emotional reactivity and the greater prevalence of borderline mood features among adolescent girls found in the present study.

In sum, sex differences in socialization of aggressive behaviors as well as susceptibility and responses to adverse social experiences may partially account for the divergence in pathways leading to conduct disorder and to borderline mood features in the current sample. The prevalence estimates for the two adolescent profiles are consistent with this argument. There was a higher prevalence of the conduct problem class among males (17.5%) than females (7.3%), whereas a higher prevalence of the borderline mood features class was found among females (12.4%) compared to males (6.2%). The sex differences in the prevalence of conduct problems and borderline mood pathology found in this study are consistent with prior research, which has found higher rates of physical aggression and conduct problems in males compared to females (Baker et al., 2007; Loeber et al., 2000; Moffitt & Caspi, 2001) and higher rates of internalizing problems (Kasen et al., 1999) and borderline pathology (Bradley et al., 2005; Edens et al., 2008; Gross et al., 2002; Sanislow et al., 2009) in clinical samples of females compared to males. Moreover, greater association between childhood physical aggression and adolescent delinquency has been found in boys than girls (Broidy et al., 2003), suggesting that aggressive girls are less likely than aggressive boys to develop later conduct problems.

Finally, in addition to socialization experiences described above, biological factors may have influenced the observed divergence among boys and females. Research is currently underway to explore biological or genetic factors contributing to sex differences in the

prevalence of these two problem profiles as well. For instance, biological vulnerabilities for conduct problems, including low sympathetic and parasympathetic reactivity and genetic vulnerabilities that interfere with dopaminergic and serotonergic functioning, may account for the predominance of males among those with antisocial pathology (Beauchaine, Hong, & Marsh, 2008; Beauchaine et al., 2009). Researchers have also begun to consider potential sex differences in hormonal and neurochemical functioning contributing to borderline personality pathology (Beauchaine et al., 2009; Fonagy, Luyten, & Strathearn, 2011), though this line of research is still nascent. However, these studies also emphasize the importance of examining sex differences as contributors to the divergence in the trajectories of aggressive-disruptive children, with overt aggression being maintained more for boys than girls, and negative emotional reactivity being maintained more for girls than boys through both social and biological mechanisms.

Resilience and the Low-Problem Comparison Profile

Seventy-eight percent of the current sample was estimated to be members of the “low problem” comparison class. The size of this low-problem group was unexpected, considering that the sample consisted of children who had high levels of externalizing behavioral problems at school entry. Moreover, this sample was drawn from geographical areas that were considered high-risk on the basis of poverty and crime, which confer numerous disadvantages, environmental risk, and suboptimal socialization experiences that could maintain or exacerbate externalizing behavioral problems (Ackerman, Brown, & Izard, 2003; Brooks-Gunn & Duncan, 1997; Halpern, 1990; Hart & Marmorstein, 2009; McLoyd, 1998; Pinderhughes, Nix, Foster, Jones, & CPPRG, 2001). A good majority of these at-risk children did not show patterns of distress consistent with conduct problems or borderline mood features by late adolescence.

It is possible that rates of disorder mentioned earlier, based on parent and youth reports on the DISC, underestimate the actual rates of problems in the sample. For example, juvenile court records show that a large proportion of the high-risk control sample in Fast Track project had arrest records by age 18, with only 52% of the youth being free of any arrest history in late adolescence, compared to 68% in the normative sample (CPPRG, 2010). Moreover, only 55% of the youth in this high-risk control sample graduated from high school (CPPRG, 2011a), whereas 73% of the youth in the normative sample graduated from high school. Hence, it is probably incorrect to think of the 78% of the youth who fell in the “low problem comparison” class as being free from problems. Instead, it might be more accurate to consider them to be youth whose problems were not severe or pervasive enough to produce a DISC diagnosis or classification in the problem classes, recognizing that the DISC appears to represent a high threshold for identifying disorder in the Fast Track sample. However, even adjusting for measurement issues, a substantial portion of the Fast Track high-risk control sample showed developmental resilience.

The findings in this study are consistent with existing longitudinal studies on trajectories of children with externalizing behavioral problems. A study by Reef et al. (2010), examining longitudinal data on birth cohorts in New Zealand, showed that only a minority of children who exhibit high externalizing behavioral problems in early childhood show persistently high behavioral problems into late adolescence and that levels of aggression decrease between ages 4 and 18 for most children, albeit with rank-order stability. The finding that physical aggression has rank-order stability but often decreases between childhood into adolescence was also reported by Broidy et al. (2003) in a multi-site investigation of longitudinal studies, which also found that only a small percentage (generally 10% or less) of the children studied had a

trajectory characterized by chronically high aggression. Another longitudinal study based on the Dunedin Multidisciplinary Health and Development Study found similarly low rates of boys (10%) who exhibited persistent conduct problems between ages 5 and 18, with this group committing the most number of violent crimes and generally showing higher rates of conduct problems at age 26 compared to those with less severe and chronic trajectories (Moffitt et al., 2002). However, in the Moffitt et al. (2002) study, many of the boys with early aggression developed other psychiatric problems by age 26, and only 15% of all boys who had child-onset conduct problems completely “recovered” and experienced no adjustment problems at age 26. These findings are quite similar to the findings for the present sample, in which rates of DISC diagnosis and latent class membership indicating significant adolescent pathology are lower than expected, but other indices of maladjustment (such as juvenile arrest records or high school dropout) show a broader pattern of prevalence in the sample.

It is also worth noting that elevations in adolescent symptoms were coded based on the normative sample data from the Fast Track project, with a cut-off score of one standard deviation above the normative sample mean to classify elevation in symptoms. This procedure allowed a consistent and meaningful way to classify symptom elevation and followed examples set by other studies to use one standard deviation as the cutoff (e.g., Kasen et al., 1996; Lanza, Rhoades, Nix, & Greenberg, 2010). However, because the children in the normative sample of the Fast Track project were recruited from schools in high-risk areas, the cutoffs may have reflected greater severity of symptoms compared to those based on a more representative sample. Indeed, one study based on the Fast Track project has found that children in the normative sample scored approximately half a standard deviation higher than the nationally representative sample on the TRF externalizing scale (Lanza, Rhoades et al., 2010). The one standard deviation

cutoff was nonetheless used in this study because the purpose of the present study was to identify groups of adolescents most at risk for future antisocial and borderline personality pathology, who were expected to have the highest levels of distress even within this at-risk sample. Exploratory analyses testing the one-half standard deviation as the cutoff did not meaningfully change the findings, although the conduct-disordered group contained approximately 7% more of the sample than when the one standard deviation cutoff was used.

Implications of the Findings

The present study tested the contributions of early vulnerabilities and adverse social experiences to the emergence of late adolescent conduct problems and borderline mood features. These late adolescent outcomes, assessed at grade 12 and the subsequent year, are of central interest because they represent potential precursors to adult personality pathology. Specifically, conduct problems have been identified as precursors to antisocial personality disorder (ASPD), and borderline mood features in adolescence have been identified as potential precursors to later borderline personality disorder (BPD).

Generally, studies on the stability of personality traits suggest that they have moderate stability in the period between adolescence and early adulthood, with stability (test-retest) coefficients typically within the .50s during the period between late adolescence and early adulthood (Caspi et al., 2005; Roberts & DelVecchio, 2000). Moreover, research on Cluster B personality disorders, the cluster of personality disorders to which ASPD and BPD both belong, has found evidence of stability for these disorders (Cohen, 2008; Cohen et al., 2005; Lenzenweger & Castro, 2005; Shiner, 2009; for reviews, see Tackett, Balsis, Oltmanns, & Krueger, 2009). For example, one longitudinal study based on the Children in the Community project found moderate levels of predictive stability between childhood and young adulthood for

Cluster B personality traits, with correlations in the range of $r = .33-.62$, and rank-order stability for this period of $r = .46-.65$ for Cluster B personality disorder traits (Johnson et al., 2000). Moreover, adolescents who were diagnosed with borderline or any Cluster B personality disorders had significantly higher levels of these traits in adulthood compared to those who did not receive a PD diagnosis in adolescence (Johnson et al., 2000). Cluster B personality disorder traits also show moderate to high stability between early adolescence and early adulthood, with stability coefficients of $r = .69$ for girls and $r = .63$ for boys – nearly double the stability of internalizing and externalizing problems (Crawford et al., 2001). These studies suggest that adolescents showing profiles of maladjustment consistent with conduct problem or borderline mood features classes may be at high risk of ASPD or BPD, especially relative to those who do not fit these profiles.

Implications for prevention. The findings in the current study suggest multiple points of intervention that may help prevent the development of conduct problems or borderline mood features in children with aggressive-disruptive problems in early childhood. Because childhood overt aggression and negative emotional reactivity surrounding school entry were both found to be significant predictors of late adolescent outcomes, early intervention appears to be crucial for effective prevention of conduct problems and borderline mood features and mitigation of long-term risk for antisocial and borderline personality pathology. In addition, for children with elevated negative emotional reactivity especially, interventions targeting relational difficulties with parents and peers may also serve to prevent the development of future borderline personality pathology.

The Fast Track project represents an example of a multi-component intervention targeting children with aggressive, disruptive, and/or oppositional behavior problems and thus at

risk for persistent conduct problems (CPPRG, 1992). The Fast Track intervention targeted various risk factors for conduct problems, including social and emotional difficulties, poor peer relations, and low parental warmth, involvement, and monitoring (CPPRG, 2011b). The ten-year intervention used a combination of universal and targeted approaches to address risk in both family (e.g., parent training group, guided parent-child interaction training) and school (e.g., child social skills training in “friendship groups” and in teacher-delivered classroom curriculum, academic tutoring) contexts, and the intervention dosage was adjusted according to child and family needs. The foci of the interventions changed according to the developmental needs of the child over the ten-year intervention period, with initial emphasis being placed on building social-emotional and academic competence in grade school and then shifting towards such foci as substance and alcohol use, sex education, and vocational goal setting, as participants transitioned from preadolescence to adolescence.

The Fast Track intervention has been found to significantly decrease clinical elevations in externalizing disorders, including Conduct Disorder, in high-risk adolescents. Among children with highest 3% of aggressive-disruptive problems at study entry, the intervention reduced the lifetime prevalence of CD from 41% found in the control sample to 20% in the intervention sample (CPPRG, 2011b). Moreover, the intervention reduced rates of juvenile arrests to 71% of the rate found in the control sample through age 19 (CPPRG, 2010), and among children in the top 3% of risk, reduced the prevalence of externalizing disorders by 43% by grade 9 (CPPRG, 2007). The intervention has also been effective in addressing childhood risk factors. For instance, after the first year of intervention, children in the intervention condition showed significantly stronger social and emotional skills, were rated more positively by peers, and had parents who showed higher levels of observer-rated warm behaviors than controls (CPPRG,

1999). By grade 3, children receiving intervention exhibited significantly lower rates of teacher-rated conduct problems and parent-rated behavioral problems, compared to controls (CPPRG, 2002). By the end of elementary school, fewer children receiving intervention were involved with deviant peers, compared to controls, and levels of aggression and disruptive behaviors at home were significantly reduced (CPPRG, 2004). Thus, especially for children with highest levels of early externalizing problems and risk, the Fast Track intervention appears to be effective in reducing risk for and preventing future conduct problems. Impressively, intervention effects have been maintained over the two-year follow-up period (CPPRG, 2011b) in early adulthood, showing promise for long-lasting gains.

However, a multi-component, long-term intervention such as Fast Track may not be available or accessible for many children. Individual intervention components may be more economically feasible alternatives, though fewer risk factors may be addressed without a more comprehensive, multi-component approach. Parent-based interventions, such as Parent Management Training (Kazdin, 1997), based on principles of operant conditioning and Patterson's work on parental reinforcement of coercive and antisocial behaviors at home (Patterson et al., 1989), or Parent-Child Interaction Therapy (Brinkmeyer & Eyberg, 2003), an intervention targeting parent-child interaction patterns to foster positive interactions and effective communication and reinforcement strategies, have produced promising results for reducing disruptive behavioral problems (Eyberg, Nelson, & Boggs, 2008; Pearl, 2009). In addition, interventions teaching child social problem solving skills have been found to reduce child aggressive behaviors in clinically referred children (Kazdin, Siegel, & Bass, 1992). Although more limited in scope than a multi-component intervention such as the Fast Track, these parent-

based or child-based interventions may help build capacities necessary for effective social and academic engagement and reduce risk for later conduct problems.

With regards to the prevention of later borderline mood features, although the Fast Track intervention has been shown to be effective in improving the child's social and emotional skills and increasing parental warmth and positive involvement, interventions specifically targeting child emotion regulation skills or increasing warmth and supportiveness in the parent-child relationship may reduce the child's long-term risk. For instance, emotion regulation skills may be taught via such individual interventions as the Turtle Technique (Schneider & Robin, 1978), and increased capacity to regulate affect may not only reduce the risk of later mood pathology but may also reduce the risk of peer rejection and other social difficulties that exacerbate risk of borderline pathology. Interventions such as the Parent-Child Interaction Therapy (Brinkmeyer & Eyberg, 2003) may also promote positive engagement and warmth in the parent-child relationship, further reducing risk. Because low parental warmth and other parenting problems are key risk factors for the development of future borderline pathology, especially among children with elevated negative emotional reactivity, interventions designed to improve parent-child relations may have an important protective influence for these at-risk children.

In sum, there are numerous interventions that may be appropriate for addressing overt aggression and negative emotional reactivity in early elementary school years. These interventions may help prevent future conduct problems and borderline mood pathology in at-risk children by decreasing the levels of overt aggression and negative emotional reactivity and/or addressing the psychosocial risk factors associated with these vulnerabilities.

Strengths and Limitations

This study had several strengths. First, the study utilized data from a prospective longitudinal study with a community sample in order to test the hypothesized models, which allowed childhood and adolescent constructs to be examined in the context of participants' natural developmental processes. Second, the study sample consisted of children with elevated aggressive, disruptive, and oppositional behavioral problems at school entry, which facilitated the detection of the impact of childhood risk on later psychosocial functioning. Third, the study utilized a statistical method, latent class analysis specifically, that allowed identification of groups of adolescents showing similar symptom profiles. Being able to model group memberships empirically in latent class analysis increased the confidence that the findings were more valid and true to the data compared to those obtained by hand-assigning adolescents to pre-determined problem groups that may not have accurately described the sample. Fourth, the study utilized different reporters to assess early childhood vulnerabilities (teacher-report), adverse social experiences (observer-report by peers and interviewers), and later adolescent outcomes (adolescent and parent report), thereby limiting reporter effects that may have inflated the associations among study constructs. However, the present study also had several limitations that warrant discussion.

Limitations of the sample. First, the present study was based on a sample of children with elevated externalizing problems. Although this at-risk sample was useful for identifying the role of early risk for future conduct and mood problems, the findings are specific to children who have elevated externalizing problems in early childhood and may not generalize to a more representative population, including children who are well-adjusted in elementary school or have

only internalizing problems. Thus, caution needs to be exercised in extrapolating from the current findings.

Limitations in measurement. A measure of borderline personality pathology did not exist in the Fast Track project, and thus borderline mood features were assessed with measures of depressed mood, suicidality, and anger. Although there is strong support for these features to mark borderline personality pathology (Gunderson & Phillips, 1991; Gunderson & Ridolfi, 2001; Korner et al., 2008; Skodol et al., 2002; Zanarini & Frankenburg, 2007) and to be identifiable in adolescents as potential markers of borderline pathology (Becker, McGlashan, & Grilo, 2006; Bondurant et al., 2004; A. L. Miller et al., 2008; Tackett et al., 2009), other constructs central to borderline personality pathology were not examined in this study. Future studies might assess other specific and important features of borderline pathology in adolescents, including disturbances in representations of the self and the other (Bender & Skodol, 2007; Carlson et al., 2009; Crawford et al., 2009; Fonagy et al., 2000; Sanislow et al., 2002), mood reactivity to loss, rejection, and separation (Gunderson & Phillips, 1991; Levy et al., 2007), and affective instability (Cole et al., 2009; Putnam & Silk, 2005; Sanislow et al., 2002) characterized by anger, anxiety, and oscillation between depression and anxiety (Koenigsberg et al., 2002).

Along similar lines, it would be important in future studies to explore the nature of depressive mood reported by adolescents to examine whether it is consistent with dysphoria characteristic of borderline pathology. A review by Gunderson and Phillips (1991) summarized features of dysphoria that are unique to BPD and distinguishable from major depression, and these features included emptiness, loneliness, anger, neediness, repeated suicidal gestures, demandingness, hostile-dependent tendencies in relationships, concerns with loss and separation, and illusions of self-sufficiency. Numerous studies have supported these distinctions. For

instance, a study with young adult inpatients found that patients with BPD, with and without comorbid depression, reported higher levels of anaclitic neediness, or feelings of helplessness, anxiety regarding separation or rejection, and concerns surrounding frustration and loss of gratification, compared to patients with depression only (Levy et al., 2007). Similarly, in another study involving adolescent inpatients, patients with BPD reported greater dependency concerns and self-criticism and lower sense of self-efficacy compared to depressed controls (Wixom et al., 1993). Higher levels of self-condemnation, hopelessness, emptiness, and self-destructiveness (Rogers, Widiger, & Krupp, 1995) and higher levels of dependency concerns and self-criticism (Westen et al., 1992) compared to depressed controls have also been found in adult inpatient samples as well. Although these qualities of dysphoria were not assessed in this study, identifying and exploring them would be important in future studies, especially considering that many of these features (e.g., dependency and feelings of emptiness, helplessness, and worthlessness) have been found to be features of borderline personality pathology that are most resistant to remission (Zanarini et al., 2007).

It is also worth noting that some constructs were measured in a limited fashion in this study. For example, in order to support a clear test of moderation in middle childhood with an independent informant, warm involvement was the only dimension of parenting examined in this study. Warm parental involvement had the advantage of theoretical relevance for the development of both borderline mood features and conduct problems, and it was assessed continuously for 4 years during middle childhood by an independent (unbiased) observer. Hence, it fit the measurement needs of this study. However, other qualities of parenting such as coercive parenting, responsivity, appropriate and consistent discipline, and attachment have also been highlighted as key aspects of parenting that contribute to the child's risk for future conduct

problems or borderline mood pathology, and they warrant examination in future studies. For instance, low parental warmth assessed in the study may not have captured aspects of negative parenting that may amplify early vulnerabilities, such as hostile, coercive, or inconsistent parenting (Granic & Patterson, 2006; Patterson, 1986; Patterson & Bank, 1989). As such, future studies might examine the interaction of early overt aggression with such parenting in predicting future conduct problems. Moreover, as discussed above, more prospective studies of attachment are needed in order to examine whether problems in attachment relationships may give rise to and maintain negative emotional reactivity and social problems that have been found to increase risk for future borderline pathology.

Issues of directionality. It is important to note that, although adverse socialization experiences were conceptualized as moderators of early behavioral vulnerabilities in this study, it is also possible that causality worked in the opposite or transactional manner. A clearer model of the nature of causality would have been possible with a cross-lagged design, in which both child characteristics and social experiences were represented at multiple time points. Then, one could determine the support for an opposite direction of influence, in which parent and peer influences affected the development of child negative emotional reactivity and overt aggression. Similarly, one could compare a model in which negative emotional reactivity or aggression moderated the link between low parental warmth or peer rejection and later adolescent outcomes. The differential susceptibility hypothesis is consistent with this view, which posits that levels of reactivity or susceptibility moderate the impact of environmental stressors (Belsky & Pluess, 2009). There are studies that have conceptualized developmental processes and moderation to work in this direction, showing that child temperamental vulnerabilities moderate the impact of negative parenting practices on child adjustment (Lengua, 2008; Morris et al., 2002) and emotion

regulation strategies (Mirabile, Scaramella, Sohr-Preston, & Robison, 2009). Interestingly, Denham et al. (2000) have found that the impact of parenting qualities, including maternal anger and supportive behaviors, on child externalizing behaviors in childhood was moderated by the level of earlier externalizing problems such that children with higher rather than lower initial externalizing problems were more responsive to the impact of parenting. Considering that the current sample of children also showed high levels of externalizing problems in early childhood, these children may have been especially susceptible to the ill effects of low parental warmth and peer rejection, becoming maladjusted in response to, rather than by evoking, these adverse experiences in childhood.

Methodological limitations. There were other methodological limitations of this study. As with many longitudinal studies, there was a significant amount of missing data in this study. In the present study, sufficient data was available for only 71% of the original sample. Although power analysis suggested that the current sample size of 317 is sufficient to detect small effect sizes (J. Cohen, 1992), the missingness in the data likely rendered some bias to the results. As reported above and summarized in the Appendix, there were some differences between cases with adequate data to be included into analysis and those that could not be entered into analysis due to insufficient data. The most notable difference was that the children who did not have adequate data had significantly higher levels of overt aggression and negative emotional reactivity in early childhood. Thus, some of the highest-risk children were missing from analysis, and this may have led to a lower proportion of the sample showing elevated conduct problems and borderline mood features. Furthermore, the majority (74%) of the children who could not be included in analysis were missing all adolescent data, suggesting that many of these highest-risk children may have dropped or moved out of the Fast Track participating schools.

Because attrition of highest-risk children would be expected to reduce power for detecting significant effects of behavioral problems, effects that were not found in the current study may have resulted from sample attrition. However, significant effects were nonetheless detected in this study. Thus, findings in this study may reflect relatively robust developmental processes predicting to conduct problems and borderline mood features among children with early externalizing problems.

Conclusions

The findings of this study suggest the importance of early intervention in the prevention of both conduct problems and borderline mood features in late adolescence, which may, in turn, reduce adult antisocial and borderline personality pathology. Especially for children who exhibit high levels of overt aggression or negative emotional reactivity, targeted interventions that promote self-regulation, emotion regulation, and effective social and emotional functioning are crucial for reducing the risk of future conduct and mood problems. Moreover, especially for children with high negative emotional reactivity, multi-component interventions promoting better peer relations and warmer, more sensitive parenting may be indicated. Overall, risk for future antisocial and borderline personality pathologies appears to be identifiable in early childhood. Child therapists and interventionists can play pivotal roles in the prevention of these pathologies, potentially reducing considerable amounts of destruction, loss, and suffering among children fortunate enough to receive and respond to early intervention.

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Appendix

Comparison of Included and Excluded Cases

Comparison of Demographic Information Between Cases Included and Excluded from Analysis

Variable	Included in analysis (<i>n</i> = 317)	Excluded from analysis (<i>n</i> = 129)
Age at School Entry (in Years)	6.42 (.47)	6.45 (.47)
Sex		
Male	207 (65.3%)	89 (69%)
Female	110 (34.7%)	40 (31%)
Race		
White	152 (47.9%)	66 (51.2%)
Black	159 (50.2%)	57 (44.2%)
Other	6 (1.9%)	6 (4.6%)
Site		
Durham	93 (29.3%)	16 (12.4%)
Nashville	74 (23.3%)	42 (32.6%)
Central Pennsylvania	91 (28.7%)	21 (16.3%)
Seattle	59 (18.6%)	50 (38.8%)

Note. The included and excluded cases did not significantly differ on the demographic variables with the exception of site, $\chi^2(3, N = 446) = 34.62, p < .001$.

Comparison of Study Variables Between Cases Included and Excluded from Analysis

Variable	Included in analysis (<i>n</i> = 317)	Excluded from analysis (<i>n</i> = 129)
Early childhood vulnerabilities		
Overt aggression ^a	.61 (.48)	.71 (.45)
Negative emotional reactivity ^b	.30 (.77)	.46 (.66)
Adverse social experiences		
Peer rejection		
Never	143 (45.1%)	35 (27.1%)
One year	95 (30%)	28 (21.7%)
Multiple years	79 (24.9%)	28 (21.7%)
Low parental warmth		
Never	150 (47.3%)	57 (44.2%)
One year	109 (34.4%)	38 (29.5%)
Multiple years	58 (18.3%)	10 (7.8%)
Adolescent outcomes		
Depressed mood	57 (18.0%)	10 (7.8%)
Suicidality	27 (8.5%)	2 (1.6%)
Anger	70 (22.1%)	9 (7.0%)
Index offenses	39 (12.3%)	4 (3.1%)
Conduct disorder symptoms	43 (13.6%)	8 (6.2%)

Note. Values for early childhood vulnerabilities represent means and standard deviations. Count is provided for adverse social experiences, whereas the number of cases with elevated symptoms is displayed for each adolescent outcome. Percentages in parentheses represent the column (within-group) percentage. The study variables did not significantly differ between groups, with the exception of early childhood vulnerabilities.

^a $F(1, 443) = 3.97, p = .05.$

^b $F(1, 442) = 4.72, p = .03.$

Abbreviated Vita

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EDUCATION

2009-2012 (Anticipated)	Ph.D. in Clinical Psychology, Pennsylvania State University
2006-2009	M.S. in Clinical Psychology, Pennsylvania State University
2002-2006	M.A. in Political Science, University of Pennsylvania
1998-2001	B.A. in International Relations, Stanford University

RECENT EXPERIENCE

Research:

2010	Research Assistant, Head Start REDI Project
2008-2009	Research Assistant, Focus on Learning Project

Teaching:

2009-2011	Instructor, Pennsylvania State University, World Campus PSYCH 441 (Health Psychology) PSYCH 243 (Positive Psychology) PSYCH 200 (Elementary Statistics)
2006-2008	Teaching Assistant, Pennsylvania State University, University Park
2004-2006	Teaching Assistant, University of Pennsylvania

Clinical:

2011-2012	Psychology Intern, Kaiser Permanente, San Diego Department of Psychiatry and Addiction Medicine
2006-2010	Staff Therapist, Psychological Clinic, Pennsylvania State University
2007-2009	Clinic Assistant, Psychological Clinic, Pennsylvania State University

PUBLICATIONS

Welsh, J. A., Bierman, K. L., & **Okado, Y.** (2011). *Promoting school readiness in the context of socio-economic adversity: Associations with parental demoralization and parent support for learning.* Manuscript submitted for publication.

Okado, Y., & Azar, S. T. (2011). The impact of extreme emotional distance in the mother-child relationship on the offspring's future risk of maltreatment perpetration. *Journal of Family Violence, 26*(6), 439-452.

Azar, S. T., Goslin, M. G., & **Okado, Y.** (2008). Achieving peace in the family. In de Rivera, J. (Ed.), *Handbook on building cultures of peace* (pp. 319-332). New York, NY: Springer.