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**DO PHYSICAL ABUSE, CUMULATIVE RISK, AND HOSTILE
ATTRIBUTION BIAS PREDICT THE QUALITY OF PEER
RELATIONSHIPS DURING EARLY ADOLESCENCE?
AN EXAMINATION OF HIGH-RISK YOUTH**

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ABSTRACT

The present study examines the peer relationships of physically abused early adolescents and their non-abused, sociodemographically matched counterparts ($n = 200$). We tested whether proximal and distal cumulative risk factors predict self-reported closeness and conflict with best friends and peer acquaintances. We also examined one of the cognitive correlates of physical abuse, hostile attribution bias, as a potential mechanism for any observed relation between proximal and distal cumulative risk and our outcome variables. Results from path analyses reveal differences between the physical abuse and the control group in that distal cumulative risk negatively predicted best friend closeness among the physical abuse group only. There were no mediational effects of hostile attribution bias, although hostile attribution bias negatively predicted acquaintance closeness among the abuse group only. Contrary to our expectations, proximal cumulative risk was not a significant predictor of any of our dependent variables, nor did we find any significant predictors for best friend conflict or acquaintance conflict. Overall, the findings suggest distal cumulative risk and hostile attribution bias may negatively impact physically abused children's perceived closeness, but not conflict, with best friends and acquaintances.

TABLE OF CONTENTS

LIST OF FIGURES	vi
LIST OF TABLES	vii
ACKNOWLEDGEMENTS	viii
CHAPTER 1 Introduction.....	1
Friendships During Early Adolescence.....	3
Friendship quality dimensions	4
Friendship quality among at-risk youth.....	5
Cumulative Risk and Adolescent Development.....	6
Measuring cumulative risk	9
Cumulative risk factors for social maladjustment	10
Physical Abuse.....	13
Physical abuse and cumulative risk.....	14
Hostile attribution bias and physical abuse	15
Friendship quality of physically abused children.....	16
CHAPTER 2 The Present Study	20
Hypotheses	22
Cumulative risk, physical abuse, and best friendship.....	23
Cumulative risk, physical abuse, and acquaintance relationships	23
Hostile attribution bias as a mediator	24
CHAPTER 3 Method.....	25
Participants.....	25
Measures	26
Cumulative risk factors	26
Best friendship and acquaintance relationship quality	28
Hostile attribution bias	29
CHAPTER 4 Results.....	31
Preliminary Analyses	31
Missing data	31
Exploratory factor analysis.....	31
Descriptive statistics and correlations	32
T-tests	33
ANOVA	34
Main Analysis	34
Path Analysis.....	34
CHAPTER 5 Discussion.....	45
Proximal Cumulative Risk	46
Distal Cumulative Risk	49
Hostile Attribution Bias	51

CHAPTER 6 Limitations.....	54
CHAPTER 7 Conclusion.....	56
REFERENCES	58

LIST OF FIGURES

Figure 1	Original Path Model for Abuse Group with Standardized Regression Weights	41
Figure 2	Original Path Model for Control Group with Standardized Regression Weights	42
Figure 3	Final Path Model for Abuse Group with Standardized Regression Weights	43
Figure 4	Final Path Model for Control Group with Standardized Regression Weights	44

LIST OF TABLES

Table 1 Cumulative Risk Factors.....	30
Table 2 Correlations for Distal and Proximal Cumulative Risk Variables.....	37
Table 3 Mean Scores and Standard Deviations for All Study Variables	38
Table 4 Correlations Among Study Variables	39
Table 5 Correlations Among Study Variables by Group	40

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CHAPTER 1

Introduction

Although previous theoretical and empirical research has established the importance of peer relationships for early adolescent development (Hartup, 1993), there remains some gaps in our understanding of peer relationships among high-risk, minority youth. There is some evidence suggesting that high-risk, Black and Latino adolescents compensate for inadequate family support by becoming closer to their friends over time (Way & Pahl, 2001; Way & Pahl, 2006). However, researchers have not yet identified factors that may predict this compensatory model of social support. The present study investigates whether individuals' level of exposure to environmental risk may be related to adolescents' peer relationship quality.

It is unknown if the presence of multiple environmental and family risk factors (i.e., cumulative risk) has additive effects on adolescent friendships and relationships with peers more generally. Environmental risk factors commonly associated with poor developmental outcomes for Black and Latino adolescents include overcrowded households, an increased prevalence of neighborhood crime, and high-stress life events (Evans, Li, & Sepanski Whipple, 2013). Parental characteristics, such as maternal psychopathology, employment status, and marital status, have also been associated with poor developmental outcomes (Evans et al., 2013). Research on adolescent development suggests that with each additional risk factor present, an individual's likelihood of developing problem behavior increases (Rutter, 1979). Therefore, it is worth investigating whether cumulative risk also negatively impacts adolescents' peer

relationship quality, since peer relationships become increasingly important sources of emotional support during this time (Furman & Buhrmester, 1992).

Cumulative risk also poses a threat to children's health and safety by providing the ecological context for child abuse (Garbarino & Kostelny, 1992). In a 17-year, prospective study of at-risk youth, researchers found that children with four or more cumulative risk factors present were approximately seven-and-a-half times more likely to experience physical abuse or neglect compared to children with no risk factors present (Brown, Cohen, Johnson, & Salzinger, 1998). Although both physical abuse and cumulative risk have been independently linked to socioemotional problems for children and adolescents, they may be driven by similar macro-level, societal forces, such as economic and sociopolitical trends (Coulton, Korbin, Su, & Chow, 1995; McGee, Wolfe, & Wilson, 1997; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Forehand, Biggar, & Kotchick, 1998; Jaffee, Caspi, Moffitt, & Taylor, 2004).

Although they may share antecedents, physical abuse may be a distinct predictor variable from other cumulative risk factors because it may negatively impact children's social information processing style such that they become biased towards perceiving hostility in others' actions (Dodge, Pettit, Bates, & Valente, 1995). Through this hostile attribution bias, physical abuse may operate on various developmental outcomes by negatively affecting children's friendship quality and relationships with peer acquaintances. Emerging research on the social adjustment of maltreated early adolescents supports the idea that the cognitive correlates of physical abuse have unique effects on children's peer relationships (Tiesl & Cicchetti, 2008).

The aim of the present study is to examine the effect of two types of cumulative

risk, proximal (i.e., socioemotional) and distal (i.e., sociodemographic), on peer relationships using a high-risk sample of minority youth during early adolescence ($n = 200$). We also tested whether these relations differed among individuals who have experienced physical abuse during childhood and those who have not. Furthermore, we examined whether hostile attribution bias has a mediational effect between the cumulative risk variables and the quality of early adolescents' peer relationships. To address our research aims, we examined two aspects of peer relationship quality, closeness and conflict, within early adolescents' relationships with best friends and acquaintances.

Friendships During Early Adolescence

The ability to form and maintain harmonious, dyadic friendships is an important developmental milestone that signifies the ability to develop meaningful relationships with others outside of the family (Sullivan, 1953). Friendships are beneficial to children's social development because having friends can give children access to new experiences that foster the development of important social skills that lay the foundation for future relationships (Sullivan, 1953; Berndt, 1996; Parker & Gottman, 1989; Newcomb & Bagwell, 1996; Huston & Ripke, 2006). For example, competitive play with friends encourages children to develop cooperation and conflict resolution skills, and idly "hanging out" with friends encourages intimate exchanges and companionship. Unlike relationships with classmates or acquaintances, friendships require emotional investment and can provide personal validation for children (Sullivan, 1953). Thus, the quality of

these friendships, particularly best friendships, is important for children's social development and future relationships.

Friendship quality dimensions

Friendship quality consists of many dimensions that can be assessed individually or in terms of how they impact overall friendship quality. To determine whether a friendship is "high" or "low" in overall quality, it may be helpful to dichotomize friendship quality dimensions as positive or negative. For instance, Parker and Asher (1993) identify the positive features of friendship quality as prosocial behavior (e.g., helping, complimenting, sharing), intimate disclosure (e.g., sharing secrets), availability for companionship (i.e., the degree to which friends spend enjoyable time together), personal validation (i.e., mutual feelings of importance), loyalty, and good conflict management. The authors identify the negative features of friendship quality as conflict, jealousy, rivalry, and betrayal (Parker & Asher, 1993).

To fully understand overall friendship quality, it is optimal to examine the interplay between negative and positive friendship features rather than focusing solely on either positive or negative features. For example, a child engaged in a high quality friendship helps their friend with personal problems and resolves any interpersonal conflicts quickly and without lingering anger. In contrast, a child engaged in a low quality friendship is more likely to share secrets with others, engage in frequent and/or intense conflicts and competitions, and hold a grudge after an argument. In accordance with Berndt's (1996, 2002) perspective on friendship quality, the present study examines both positive (e.g., closeness) and negative (e.g., conflict) friendship quality

characteristics.

Friendship quality among at-risk youth

For at-risk youth, there may be advantages to forming close friendships, as positive peer relationships have been identified as a protective factor against various negative outcomes during adolescence (e.g., Rubin et al., 2004; Bollmer et al., 2005; Schmidt & Bagwell, 2007; Gaertner, Fite, & Colder, 2009). For example, among individuals with externalizing behavior problems, the presence of a high-quality friendship during middle childhood appears to protect children against the risk of becoming bullies (Bollmer et al., 2005). Also, high-quality friendships appear to buffer against the negative effect of peer victimization on girls' depression and anxiety (Schmidt & Bagwell, 2007) and the negative influence of poor parenting on children's internalizing symptoms (Rubin et al., 2004; Gaertner et al., 2009). There is also research suggesting that the failure to form close friendships during middle childhood places individuals at risk for developing depression and other adjustment difficulties during early adulthood (Bagwell, Newcomb, & Bukowski, 1998; Bagwell, Schmidt, Newcomb, & Bukowski, 2001).

The impact of discordant parent-child relationships on the friendship quality of at-risk youth during adolescence is unclear due to inconsistent findings in the peer relationship literature. For example, Greenberg, Siegel, and Leitch (1983) found that adolescents who reported high levels of personal stress felt closer to their parents compared to their friends and were more likely to turn to their parents for support. However, the researchers examined a predominately White, middle-income sample of

adolescents who may not experience the same challenges faced by many Black and Latino youth living in low-income communities. In contrast, longitudinal research that has examined the friendships of low-income Black, Hispanic, and Asian-American adolescents has found evidence supporting a compensatory model of social support such that high-risk 9th graders who report low parental support also report higher friendship support over time (Way & Pahl, 2001).

A follow-up study at age 17 revealed that although some adolescents in the study reported low support from both parents and friends, those who reported the lowest levels parental support at the beginning of the study also showed the sharpest gains in friendship support over time (Way & Greene, 2006). The results support the notion that for some high-risk adolescents, friendship support functions as a compensatory form of social support when parental support is lacking. Whether this compensatory process is advantageous to long-term social development remains undetermined in the literature. It is currently unclear in the peer relationship literature why some at-risk adolescents with discordant familial relationships are able to form supportive, close friendships with their peers whereas others report difficulties with their friendships. We propose in the present study that differences in exposure to cumulative risk may predict friendship quality during early adolescence, as well as relationship quality with peer acquaintances.

Cumulative Risk and Adolescent Development

Rather than focusing on a single factor, cumulative risk researchers examine the additive effects of multiple factors that place children at risk for a host of negative

outcomes during adolescence, such as violence, drug abuse, delinquency, suicide, and gang membership (Bry, McKeon, & Pandina, 1982; Vega, Gil, Zimmerman, & Warheit, 1992; Saner & Ellickson, 1996; Esbensen, Peterson, Taylor, & Freng, 2009; van der Laan, Veenstra, Bogaerts, Verhulst, & Ormel, 2010). Early research on cumulative risk, such as the famed Isle of Wight study (Rutter, 1979) and the Rochester Longitudinal Study (Sameroff, Seifer, Zax, & Barocas, 1987), focused on populations of children who faced a constellation of variables that pose threats to healthy psychosocial development. In both studies, an individual's probability of maladjustment during adolescence increased linearly with exposure to an additional risk factor (e.g., maternal psychopathology, poverty, and harsh parenting). These early cumulative risk studies demonstrated that exposure to multiple risk factors is detrimental to child and adolescent development. The overall conclusion drawn from both studies was that there is no specific risk factor or combination of risk factors that place children at unique risk for the negative outcomes they examined. Thus, by taking a cumulative risk approach, researchers can target individuals who are most at-risk by examining a large constellation of risk factors rather than narrowing their focus on a smaller subset of singular risk factors.

Although the reasons why cumulative risk appears to have strong predictive power remain unclear, biological research on allostatic load provides some insight into the negative psychological and health effects of cumulative risk exposure (Evans et al., 2013; McEwen & Stellar, 1993). Allostatic load refers to the inefficiency or malfunctioning of various systems in the body that interact with each other during stress responses, such as the central nervous system, immune system, and endocrine system

(McEwen, 1998). For individuals who face multiple and repeated stressors for a prolonged period of time, bodily systems associated with stress response become overactive, fail to shut down when stressors are no longer present, and lead to long-term irregularities in bodily responses to both stress and resting states (McEwen, 1998). Thus, as cumulative risk increases, so does the body's allostatic load. Evans and colleagues have examined the relation between allostatic load and cumulative risk and found both concurrent and prospective evidence to support the notion that a high allostatic load index (e.g., hypertension plus elevated levels of overnight cortisol, epinephrine, and norepinephrine) is the mechanism by which cumulative risk has deleterious effects on developmental outcomes (Evans, 2003; Evans, Kim, Ting, Teshler, & Shanis, 2007; Evans & Kim, 2012).

A longitudinal study of older adults (age 58 – 79) noted a link between social relationship quality and allostatic load (Seeman, Singer, Ryff, Deinberg Love, & Levy-Storms, 2002). The findings suggest that high levels of perceived emotional support from various social relationships (e.g., adult children, spouse, friends) predicted lower levels of allostatic load. Interestingly, there was also a cumulative effect of social support throughout the lifespan such that individuals who reported having positive social relationships during childhood and young adulthood also showed lower levels of allostatic load during late adulthood. Therefore, it may be useful to examine peer relationships among high-risk youth because, as the findings of Seeman et al. (2002) suggest, early social relationships may play an important role in protecting individuals with high cumulative risk exposure against developing a high allostatic load.

Measuring cumulative risk

Traditionally, cumulative risk is measured as a single variable that represents the number of identified risk factors to which an individual is exposed. Subsequently, individuals are assigned a cumulative risk score that is derived from the sum of total number of risk factors present. The risk factors identified in each study may vary, but it is common for some individual risk factors to overlap (e.g., family stress and single parenthood; low maternal education and maternal unemployment). Evans et al. (2013) argue that the creation of a cumulative risk score should include variables that are conceptually related to one another because the risk variables that are linked to poor developmental outcomes may share common root causes. Once researchers identify risk factors of interest, the variables are changed into a dichotomous variables (1 = presence of risk; 0 = absence of risk), ensuring that each risk factor is standardized and weighted equally.

One critique of creating a cumulative risk score from dichotomous variables is that the effects of intensity, duration, and temporal order of each risk factor cannot be examined (Maccallum, Zhang, Preacher, & Rucker, 2002). However, creating a single predictor variable that is unencumbered by these concerns can be a methodological strength. For instance, cumulative risk scores have been shown to modestly predict later maladjustment without the need for examining the complexity of the circumstances for each individual risk factor, and is therefore, a more parsimonious approach to understanding developmental risk (Evans et al., 2013). Furthermore, collecting simplified data via dichotomous risk variables does not require participants to provide descriptive information about sensitive, risk-related topics, which may be particularly important for

researchers to consider when conducting research on hard-to-access, high-risk populations. As such, the analysis of a single cumulative risk variable is both methodologically prudent and can minimize the potential for participant duress during data collection.

Cumulative risk factors for social maladjustment

In reviewing the extant literature on risk factors that have demonstrated links to adolescents' maladjustment, several factors found across Bronfenbrenner's (1977) ecological systems emerge as relevant to understanding children's social development. For example, the system most proximal to the child is the microsystem, which includes a child's biological systems as well as their parents, peers, neighborhood, and school. The microsystem interacts with the mesosystem, which includes the family unit's relation to other institutions, such as neighborhood, schools, and the parents' workplace.

According to Evans et al. (2013), the inclusion of risk factors that arise in more than one ecological system allows for analysis of direct and interactive effects of cross-domain cumulative risk, which has only recently been explored in the cumulative risk literature. For example, Brennan, Hall, Bor, Najman, and Williams (2003) examined two domains of cumulative risk, social and biological, and found an interactive effect between both domains on the onset of aggressive behavior. Additionally, Whipple, Evans, Barry, and Maxwell (2010) found main and interactive effects of school-level cumulative risk and home-level cumulative risk on adolescents' academic achievement. However, other studies have not found any interactive effects between multiple domains of cumulative risk on child development (e.g., Candelaria, Teti, & Black, 2011), although cross-study

comparisons are difficult to interpret due to differences in how cumulative risk is conceptualized and which developmental outcomes are assessed across studies.

Rather than focus on personal-level, microsystem characteristics of the young adolescents in this study, such as temperament, emotion regulation, and physiological functioning, we have narrowed the scope of the present study to include micro- and meso- system cumulative risk factors that relate to the family and home environment. Emerging research suggests that, during early adolescence, personal-level characteristics are mutable developmental outcomes that may be influenced by one's exposure to environmental stressors (Laceulle, Nederhof, Karreman, Ormel, & Van Aken, 2012; Marsman et al., 2012). For instance, differences in the developmental trajectories of effortful control and temperament have been found between adolescents who are exposed to either high or low levels of stress throughout their adolescent years (Laceulle et al., 2012). Additionally, differences in stress-related physiological functioning (i.e., basal cortisol levels and cortisol awakening response) have been noted between high and low socioeconomic status groups of early adolescents (Marsman et al., 2012). As such, we have chosen not to include microsystem risk factors that are susceptible to the effects of stress exposure in the cumulative risk predictor variables composited in our study of high-risk youth. The family and home micro- and meso- system risk factors that we selected for this study have been identified by previous researchers as relevant, although not limited, to the study of minority youth living in urban environments.

The selected cumulative risk factors for the present study are presented in *Table 1* (p. 30) and are based on Sameroff, Bartko, Baldwin, Baldwin, and Seifer (1998). Unlike Sameroff et al. (1998), we examine two different domains of cumulative risk, proximal

and distal. We conceptualize proximal cumulative risk variables as those that are related to the child's immediate family context and the overall socioemotional functioning of the family unit (e.g., family mental illness, family stress). In contrast, we conceptualize distal cumulative risk variables as those that are demographic and describe the family unit's socioeconomic status (e.g., welfare recipient status, maternal occupational prestige). We share the belief of Stockhammer et al. (2001) that "there are meaningful differences in the proximity of events to the child and that they differ in their impact accordingly," (p. 322). Yet, few, if any, studies have examined whether cumulative risk proximity uniquely affects social relationships during adolescence.

Proximal and distal cumulative risk may affect children's social relationships through different mechanisms. For instance, children may be exposed directly to proximal cumulative risk factors (e.g., harsh parenting, family stress, family mental illness, and parental experience of assault), and the personal stress experienced may negatively impact their allostatic load. In contrast, children may be more likely to experience indirect effects of distal cumulative risk factors (e.g., maternal occupational prestige and education level) because the variables are more proximal stressors to their parents rather than themselves. However, children may still have negative experiences associated with distal cumulative risk as these factors may negatively impact parenting behaviors and practices. Research on Black families who live in low-income, urban neighborhoods has found a link between strained parent-adolescent relationships and parents' psychological distress related to finances and neighborhood concerns (Morrison Gutman, McLoyd, & Toyokawa, 2005). In sum, we believe the different mechanisms by which distal and proximal cumulative risk factors affect child development, particularly

peer relationships, may warrant the examination of each type of cumulative risk as separate constructs. Proximal cumulative risk may be a better predictor of children's peer relationships because proximal cumulative risk factors are more likely to directly expose children to stressors.

Arguably, child maltreatment, including physical abuse, is one of the most detrimental proximal cumulative risk variables in terms of its impact on child well-being and overall adjustment. However, it may be useful for researchers to examine the effects of proximal cumulative risk within the context of physical abuse exposure rather than including physical abuse as one of the multiple factors informing proximal cumulative risk scores. In particular, physical abuse may have specific effects on children's social information processing. Therefore, the present study examines a high-risk sample of physically abused early adolescents, as well as a high-risk, non-abused control group, to determine the effects of both cumulative risk and social information processing styles associated with physical abuse on peer relationship quality.

Physical Abuse

Cicchetti and Toth (2005) describe physical abuse and other forms of child maltreatment as "one of the most profound failures of the environment to present opportunities to foster normal developmental processes," (p. 414). Research findings that span several decades reveal that physical abuse during childhood has pervasive, harmful effects on human development, including increased risk for various psychopathological disorders, suicide, chronic illness, drug abuse, and other risky behaviors (see Norman et

al., 2002 for a review and meta-analysis). From a developmental psychopathology perspective, the likelihood of future maladjustment stemming from physical abuse is determined by the transactions between the environment and normative maturation changes over time (Sroufe & Rutter, 1984). Thus, the present study will examine physical abuse in the ecological context of cumulative risk and how physical abuse negatively impacts adolescent adjustment through its detrimental effects on early social relationships with peers.

Physical abuse and cumulative risk

Physical abuse and other types of child maltreatment have been examined as one of several risk factors in a cumulative risk model predicting poor developmental outcomes (e.g., Deater-Deckard et al., 1998; Appleyard, Egeland, van Dulmen, & Sroufe, 2005). However, child maltreatment may be conceptually different from other cumulative risk variables, and therefore, may need to be examined separately. Stockhammer et al. (2001) suggest that physical abuse is an event that is more proximal to the child relative to other risk factors, such as maternal education and neighborhood crime, because the child is the direct recipient of the behavior. Therefore, physical abuse may provide a pathway to adolescent maladjustment that is distinct from the pathways of more distal risk factors. Studies that have examined child maltreatment as a separate factor from the cumulative risk model have also found child maltreatment to be a significant predictor of maladjustment (Stockhammer et al., 2001; Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007; Raviv, Tausig, Culhane, & Garrido, 2010). However, these studies do not include a control group of non-maltreated participants in their cumulative risk model, thus making

it difficult to draw conclusions about the validity of keeping child maltreatment variables separate from the cumulative risk score.

For example, Stockhammer et al. (2001), who examined the same sample as the present study, found that increased familial and contextual cumulative risk exacerbated the negative effect of physical abuse on internalizing and externalizing behavior of early adolescents. Because the authors excluded the non-abused, high-risk control group from their analysis, the findings on cumulative risk are limited to maltreated populations. The present study intends to help disentangle the links between cumulative risk, physical abuse, and social development by examining the full sample. Furthermore, we will examine a potential mediating variable, hostile attribution bias, which may help explain any association between physical abuse and peer relationship outcomes.

Hostile attribution bias and physical abuse

Peer ratings of physically abused children reveal that they have fewer reciprocal friendships, exhibit more antisocial behavior, and are less prosocial towards their classmates than their demographically-matched, non-abused counterparts (Salzinger, Feldman, Hammer, & Rosario, 1993; Salzinger, Ng-Mak, Mojica, Stockhammer, & Rosario, 2002). The mechanism by which physical abuse negatively affects social adjustment may be due to the formation of an internal working model of relationships that is guided by an aggressive and hostile behavioral style (Crittendon & Ainsworth, 1989). Physical abuse may also lead to the social learning of aggressive, violent behavior (Bandura, Ross, & Ross, 1961). As a result, physically abused children have a pattern of social information processing (Crick & Dodge, 1994) that is especially attuned to

hostility cues from their peers, which creates a cognitive bias known as hostile attribution bias (Dodge et al., 1995). Hostile attribution bias has been found to mediate the link between parental physical abuse and aggressive behavior with peers (Dodge et al., 1995). Children with hostile attribution bias and subsequent aggressive behavior, therefore, may find it challenging to form and maintain harmonious friendships with their peers.

Despite the paucity of studies that have examined friendship quality of physically abused children, there is evidence to suggest that best friendships of maltreated children are characterized by more conflict and perceptions of betrayal than the best friendships of non-maltreated children (e.g., Howe & Parke, 2001). Although not explicitly examined as a mediator by previous researchers, these findings are consistent with having a social information processing style that is attuned to hostility. The present study will examine if hostile attribution bias mediates any observed links between cumulative risk and children's peer relationships in an effort to determine the mechanism by which physically abused children experience difficulties in their friendships and peer acquaintance relationships.

Friendship quality of physically abused children

Little is known about the friendship quality of physically abused children. To date, researchers who are interested in physically abused children's social development have instead focused primarily on other aspects of their peer relationships, such as popularity, peer rejection, formation of mutual friendships, and social skills exhibited in the classroom (e.g., Salzinger et al., 1993; Dodge, Pettit, & Bates, 1994; Rogosch & Cicchetti, 1994). However, the findings of the few studies that have specifically

examined friendship quality and physical abuse together are inconsistent (Parker & Herrera, 1996; Bolger, Patterson, & Kupersmidt, 1998; Howe & Parke, 2001) and point towards the need for further investigation.

For instance, Parker and Herrera's (1996) observational study of 10-year-olds and their best friends revealed that dyads that included a physically abused child expressed less intimacy during the observed tasks than dyads consisting of non-abused children. Consistent with the assertion by attachment theorists that physically abused children misperceive the emotional availability of others (Crittenden & Ainsworth, 1989), this finding may have particular deleterious effects on the overall friendship quality of girls given prior findings on the importance of intimate disclosure in female friendships (e.g., Buhrmester, 1990).

In addition to less intimacy, more conflict was observed among physical abuse dyads, particularly in game-playing tasks that were competitive in nature. The authors suggest that physically abused children may have social-information-processing impairments, such as hostile attribution bias, that make cordial competition difficult to achieve. For example, a physically abused child may attribute hostile intentions towards their friend's elated exclamations after winning the game. Higher conflict associated with physically abused children's friendships may have implications for the friendship quality dimension of companionship due to the prevalence of competitive activities during the time that children spend with friends (e.g., video games, sports, etc.). Overall, Parker and Herrera's (1996) findings are consistent with theoretical perspectives (e.g., Crittenden & Ainsworth, 1989) on how physical abuse may negatively impact children's friendship quality through hostile attribution bias.

Later research has yielded mixed support for Parker and Herrera's (1996) findings on physical abuse and friendship quality. Bolger et al.'s (1998) longitudinal study on friendship quality (2nd – 7th grade) did not find higher conflict in dyads with a physically abused child. One explanation for why this finding differs from Parker and Herrera (1996) is that they used self-report rather than observational methodology. It may be that physically abused children have difficulties recognizing conflict in their own friendships.

However, Howe and Parke's (2001) study on early adolescent dyads, which analyzed observational, self-report, and friend-report measures of friendship quality, produced results that are consistent with Parker and Herrera's (1996) findings on conflict. Not only did abused children exhibit more overall negative behaviors (e.g., angry coercive behavior) towards their non-abused friend during lab tasks, but they also reported more conflict and betrayal in their friendship than did their non-abused friend (Howe & Parke, 2001). Additionally, observed negative behavior of the abused child towards their friend was positively, moderately correlated with the abused child's self-report of conflict and betrayal in the friendship. With regard to friendship intimacy, abused children and their non-abused friends did not report any differences in intimate exchange, which does not support Parker and Herrera's (1996) finding that physical abuse is linked to less intimacy. However, Howe and Parke (2001) only examined self-report and friend-report of intimate exchanges and, unlike Parker and Herrera (1996), did not code for intimacy in their observational tasks. Thus, understanding the friendship quality of physically abused children is complicated by use of different measures of friendship quality across the few studies that have examined this topic.

In addition to concerns about measurement, drawing conclusions about the

friendship quality of physically abused children from the above-mentioned studies is limited because a significant portion of the participants with physical abuse status had also experienced other types of abuse, such as neglect, sexual abuse, and/or emotional abuse (Parker & Herrera, 1996; Bolger et al., 1998; Howe & Parke, 2001). Although this reflects the reality for many maltreated children in the U.S. who experience “poly-victimization” over their lifetime (Turner, Finkelhor, & Ormrod, 2010), it does not allow for researchers to determine the unique effects of physical abuse apart from other types of abuse. The mechanism by which physical abuse may affect children’s friendship quality (and particularly friendship conflict) might be the specific way in which physical abuse, and not other types of abuse, impairs social cognition. Indeed, Teisl and Cicchetti (2008) examined the mechanisms by which different types of child maltreatment lead to problematic behavior with peers and found that hostile attribution bias predicted aggressive behavior and negative peer ratings for physically abused children only and not for children who experienced other types of abuse (or the control group of non-abused children). These results suggest that identifying and examining the cognitive style that is correlated with physical abuse would contribute to our understanding of why physical abuse may have unique, deleterious effects on children’s friendship quality.

CHAPTER 2

The Present Study

High cumulative risk has been associated with a variety of adverse developmental outcomes for children and adolescents, such as poor academic achievement, behavior problems, and internalizing symptoms (Evans et al., 2013). However, less is known about how cumulative risk may affect children's best friendships. The present study aims to address this gap in the literature by examining the effect of two types of cumulative risk – proximal and distal – on young adolescents' best friendship quality. Proximal cumulative risk may be more detrimental to friendship quality than distal cumulative risk because proximal cumulative risk scores are derived from socioemotional (e.g., family stress, family mental illness), rather than sociodemographic (e.g., maternal education, family structure), variables. For the present study, we examine both proximal and distal cumulative risk scores to determine if each type of cumulative risk differentially predicts best friendship closeness and conflict.

In addition to cumulative risk, we are also interested in how physical abuse may affect early adolescents' best friendships. From a compensatory model perspective, we expect that physically abused children may place particular value on best friendships during early adolescence and seek high levels of emotional support from their best friend. For example, longitudinal research on ethnic minority adolescents has found that 9th graders who reported low levels of maternal support also reported the greatest increases in best friends' support over time (Way & Pahl, 2001; Way & Greene, 2006). The findings suggest that problematic parent-child relationships may lead adolescents to seek

closeness and support from their best friends in an effort to compensate for the perceived lack of emotional support from their parents. Physically abused children may be especially vulnerable to perceiving low parental support, making them more likely seek high levels of support from their best friends. Therefore, we have examined whether the physically abused children in our sample report higher levels of best friendship closeness relative to non-abused children.

In addition to examining the quality of the relationship with a best friend, it may be useful to determine whether physically abused children perceive high emotional support from peers in general or just from their best friends. To determine intraindividual differences in children's perceptions of peers and friends, we will examine closeness and conflict between children's best friend and acquaintances and determine if the quality of both types of peer relationships may relate to participants' physical abuse status and proximal and distal cumulative risk scores.

Lastly, we will determine whether hostile attribution bias, which has been linked to physical abuse (e.g., Dodge et al., 1995), mediates any observed link between the cumulative risk scores and the peer relationship quality variables. Research has found that friendships of physically abused children are characterized by more conflict, although hostile attribution bias has not been examined as a mediating variable between high conflict and physical abuse status (e.g., Howe & Parke, 2001). For physically abused children, hostile attribution bias may mediate the hypothesized relation between proximal cumulative risk and best friendship conflict. Hostile attribution bias may also negatively affect physically abused children's perceptions of peer acquaintances such that they may be more likely to view acquaintances as threatening and less trustworthy.

Therefore, hostile attribution bias may mediate the hypothesized link between high proximal cumulative risk and low acquaintance closeness scores among physically abused children.

To address our research aims, we will examine a sample of Black, Hispanic, and White 6th graders ($n = 200$) who have experienced physical abuse in childhood and a demographically-matched control group of participants who are also at-risk but have not experienced physical abuse. One strength of the present study is that it will focus on individual differences, particularly in social cognition, within a sample that is at-risk rather than taking a more conventional approach of using a minimal-risk comparison group. The identification of social cognitive differences within a high-risk sample may assist the development of prevention and therapeutic efforts aimed at cognitive and behavioral modification. Another strength is that we will be taking a closer look at the friendship quality of physically abused, Black and Hispanic youth. Friendship quality between best friends is an aspect of peer relationships that is often overlooked in the child maltreatment literature, which instead focuses primarily on peer popularity and social competence in the classroom. Furthermore, research on friendship quality among Black and Latino children is also relatively scant.

Hypotheses

We will examine the effects of three independent variables (Distal Cumulative Risk, Proximal Cumulative Risk, and Physical Abuse) on four dependent variables (Best Friend Closeness, Best Friend Conflict, Acquaintance Closeness, Acquaintance Conflict)

and will also examine one mediating variable (Hostile Attribution Bias). The main and mediating effects will be analyzed through path analyses. To determine the main effects of physical abuse, we will run a two-group, path analysis model.

Cumulative risk, physical abuse, and best friendship.

The first research aim is to examine the effects of distal and proximal cumulative risk on the development of friendship quality (closeness and conflict) during early adolescence. For the control group, we hypothesize that *a*) high proximal cumulative risk, and not distal cumulative risk, will predict *lower* best friendship closeness. For the physically abused group, we expect that *b*) high proximal cumulative risk will instead predict *higher* best friendship closeness. Furthermore, we expect *c*) the relation between the cumulative risk variables and best friendship conflict to be the same for both groups such that high proximal, and not distal, cumulative risk will predict higher best friendship conflict.

Cumulative risk, physical abuse, and acquaintance relationships

In addition to overall best friendship closeness and conflict, we are also interested in exploring whether peer acquaintance closeness and conflict are related to distal and proximal cumulative risk and physical abuse. For our second research aim, we hypothesize that for the physically abused group, *d*) high proximal cumulative risk, and not distal cumulative risk, will predict *lower* acquaintance closeness and *e*) *higher* acquaintance conflict. For the control group, we expect the relation between cumulative risk and the acquaintance variables to be the same such that *f*) high proximal, and not

distal, cumulative risk will predict *lower* acquaintance closeness and *g) higher* acquaintance conflict.

Hostile attribution bias as a mediator

The third research aim is to test the mediating role of hostile attribution bias between cumulative risk and all of the best friend and acquaintance variables. For physically abused children, we expect that *h)* hostile attribution bias will mediate any observed link between proximal, but not distal, cumulative risk and best friendship conflict as well as *i)* any observed link between proximal, but not distal, cumulative risk and acquaintance conflict. We do not expect *j)* hostile attribution bias to be a mediating variable for any observed relations between variables for the control group or for any observed relations between the cumulative risk variables and the closeness variables in the abuse group.

CHAPTER 3

Method

Participants

Data for the current study has been obtained from the *Social Relationships of Physically Abused Schoolchildren* study (Salzinger, Feldman, & Ng-Mak, 2007), which has been made available with permission by the National Data Archive on Child Abuse and Neglect at Cornell University (<http://www.ndacan.cornell.edu>). Data was collected from 1993-97 from 4th-6th graders ($n = 200$; $M = 10.5$ years, $SD = .96$) residing in New York City. One hundred of the participants (65% male) were recruited from CPS physical abuse registry, and a control group of equal size and gender ratio were recruited to match the sample, although these children had no CPS record of physical abuse or any other type of maltreatment. Sixty-percent of the physically-abused group also had a CPS record of parental neglect, although none had sexual abuse records (see Salzinger, Feldman, Ng-Mak, Mojica, & Stockhammer, 2001 for further details about the sampling procedures from CPS records, including study exclusion criteria). Additionally, the control group was closely matched to the CPS group in terms of race, with the total sample being 47% Black, 45% Hispanic, 7% White, and 1% identified as “other.”

The CPS and control groups were closely matched on several other demographic variables, which are presented respectively: maternal education level (11.4 vs. 11.5 years), resident partner’s education level (11.4 vs. 11.1 years), maternal occupational prestige score (33 vs. 39, possible range = 1-99), resident partner’s occupational prestige

score (42 vs. 37, possible range = 1-99), maternal employment (57% vs. 63%), resident partner's employment (47% vs. 57%), and recipient of welfare during the past year (67% vs. 54%). There were two key variables in which the two groups differed, however. The CPS group participants were less likely to live with both biological parents (10%) than were the control group participants (36%) and were more likely to live in a single-parent household (73% vs. 53%).

Measures

Cumulative risk factors

Distal and Proximal Cumulative Risk scores were created for each participant based on the factor analysis of ten variables. *Table 1* (p. 30) presents the criteria by which we consider each risk factor to be either present or absent (presence = 1; absence = 0). Overall Distal and Proximal Cumulative Risk scores used for correlation analysis, ANOVAs, and t-tests will be based on the summation of risk factors present. The criteria are based on Sameroff et al. (1998), although adaptations were made to accommodate the present sample. The following risk factors were obtained from parental (usually maternal) self-report from various questionnaires: 1) *maternal education level*, 2) *maternal occupational prestige*, 3) *welfare recipient status*, 4) *family structure*, 5) *family mental illness*, 6) *family size*, 7) *family stress*, 8) *parent experience of assault*, 9) *parental discipline practices*, and 10) *neighborhood safety*. Six variables (maternal education level, family structure, family mental illness, family size, welfare status, and parental assault) were derived from parent/guardian report and required no further coding or

composite scoring. The remaining five variables that did require coding and/or composite scoring are described below.

Maternal occupational prestige

Mothers' reported occupations were given a prestige score based on the Nam-Powers Index (Miller, 1991). Scores can range from 0 (unemployed) to 99 (e.g., astronomer, physicist) with the average score being 50 (e.g., sheet metal workers, assembly line workers). Research by Nam and Boyd (2004) suggest that average scores for Black (42.4) and Hispanic (40.9) Americans are below the overall U.S. average. To adjust for the racial composition of the present study (92% Black and Hispanic), scores that are below 41 are considered a risk factor. In the present study, 67% of mothers were at-risk ($M = 31.01$, $SD = 26.3$).

Parental discipline practices

Parents/guardians were asked to think about three recent incidents in which the study child misbehaved and required discipline. Next, they were asked to reflect on the discipline strategies they had used during each incident. Based the coding system developed by Trickett and Kuczynski (1986), discipline strategies were categorized as appropriate (e.g., reasoning, requests) or harsh (e.g., physical punishment) using a range of codes. For the present study, any instance of harsh punitive strategies (physical punishment, forced appropriate behavior, and/or isolation) is considered a risk factor. Sixteen percent of the present sample had at least one instance and were therefore considered at-risk.

Environmental safety

Parents/guardians were asked to separately rate on a 1-5 Likert scale (1 = very

unsafe, 5 = very safe) their perceived safety of their neighborhood, building, and apartment (e.g., “How safe is your apartment from intruders or burglars?”). An overall neighborhood safety score was created by calculating the average score across all three ratings. For the present study, scores that are greater than or equal to one standard deviation ($SD = .85$) above the mean ($M = 3.39$) are considered a risk factor, and 18% of the present sample were at-risk.

Family stress

Parents/guardians were presented with a checklist of family stress events and were asked to indicate “yes” or “no” as to whether the event had occurred to any member of the household since the study child’s birth. Stress events included divorce, homelessness, chronic illness, alcohol abuse, drug abuse, jail time, assault, miscarriage or abortion, accident, police contact, loss of employment, and death. An overall family stress score was created by summing the number of “yes” responses (possible range 0-22). For the present study, scores that are greater than or equal to one standard deviation ($SD = 4.43$) above the mean ($M = 6.88$) are considered a risk factor, and 17% of the present sample were at-risk.

Best friendship and acquaintance relationship quality

Children completed a friendship quality questionnaire adapted from Berndt and Perry (1986). For 47 items, children were asked to think of their best friend or a classmate acquaintance and indicate how often the statement (e.g., “Does [best friend or acquaintance] help you when you need something?”) was true of their best friend or acquaintance on a 1-5 Likert scale (1 = never, 5 = very often). There are seven subscales

characterizing the following friendship quality dimensions: *emotional support* (6 items), *instrumental support* (4 items), *intimacy* (7 items), *companionship* (6 items), *loyalty* (5 items), *unpleasant competition* (4 items), and *conflict* (5 items). The authors of the original study (Salzinger et al., 2007) conducted a factor analysis of the subscales, and two factors emerged: closeness/support/help (referred to as *closeness* in our study) and conflict/competition (referred to as *conflict* in our study). Each participant in the present study has a score for Best Friend Closeness ($M = 3.39$, $SD = .92$), Best Friend Conflict ($M = 4.34$, $SD = .72$), Acquaintance Closeness ($M = 2.26$, $SD = .84$), and Acquaintance Conflict ($M = 4.10$, $SD = .85$) with a range of 1-5.

Hostile attribution bias

Children were presented with four vignettes that were adapted from Dodge and Frame's (1982) measure of hostile attribution bias. Each vignette, accompanied by a cartoon image, contained a scenario in which one of their peer-rated aggressive or non-aggressive classmates committed either an obviously-negative or ambiguously-negative act towards the participant (e.g., "...When [classmate's name] walks behind you, his milk carton spills right down your back.") After each scenario was read aloud, children were then asked a few questions about the scenario (e.g., "What would you do when the milk is spilled down your back?"). Responses were coded by the original authors for the quality of the attributed intent (Salzinger et al., 2007). For the Hostile Attribution Bias variable in the present study, we used children's attributed intent responses to a non-aggressive classmate in an ambiguously negative situation with higher scores indicating greater hostility ($M = .70$, $SD = .68$; range = 0 – 2).

Table 1

Cumulative Risk Factors

Variable	Risk Presence (1)	Risk Absence (0)	Prevalence in Sample	Factor Loadings	
				I	II
<i>Distal Cumulative Risk</i>					
Maternal Education Level	< high school diploma	≥ high school diploma	44%	.63	-.47
Maternal Occupational Prestige	Index score < 41	Index score ≥ 41	67%	.50	-.36
Family Structure	≤ 1 parent in household	Both parents in household	77%	.50	.20
Welfare Recipient	Parental report of “yes”	Parental report of “no”	61%	.70	-.15
Neighborhood Safety*	≥ 1 std. dev. above mean score	< 1 std. dev. above mean score	18%	.32	.14
Family Size*	> 3 children in household	≤ 3 children in household	27%	.40	-.07
<i>Proximal Cumulative Risk</i>					
Parent Experience of Assault	Parental report of “yes”	Parental report of “no”	17%	.08	.59
Family Stress	≥ 1 std. dev. above mean score	< 1 std. dev. above mean score	17%	.37	.65
Family Mental Illness	≥ 1 household member	< 1 household member	22%	.28	.61
Parental Discipline Practices*	Harsh punishment	No harsh punishment	16%	-.03	.03

Note. *Dropped from further analysis due to low factor loadings.

CHAPTER 4

Results

Preliminary Analyses

Missing data

In order to ensure that the linear regression models for path analysis included the same data, the patterns of missing data for continuous variables were examined to determine if the data was missing at random. The results of Little's MCAR test, $\chi^2(28) = 22.66, p = .75$, indicate that the data was missing completely at random (Little & Rubin, 1987). Thus, all missing values were imputed through maximum likelihood estimation using the expectation maximization (EM) algorithm in IBM® SPSS® 22. The amount of missing data for each study variable was very small (Maternal Occupation = 1.5% and Neighborhood Safety = 0.5%); there were only four missing values total. Imputed data was used for all analyses in the present study.

Exploratory factor analysis

Using IBM® SPSS® 22, we performed an exploratory factor analysis with ten cumulative risk variables, and the factor loadings are presented in *Table 1* (p. 30). Before analysis, the number of factors was fixed at two based on our a priori assumptions about the emergence of two types of cumulative risk, distal and proximal. The results indicated that seven out of the ten variables had acceptable factor loadings ($\geq .50$) on one of the two factors. The three variables (Environmental Safety, Physical Punishment, and Family

Size) that did not sufficiently load on either of the two factors were not included in any further analysis. For the seven remaining cumulative risk variables, a bivariate correlation analysis was conducted, and the results are shown in *Table 2* (p. 37). The final, two-factor solution for the cumulative risk variables is presented in *Table 1* (p. 30). Four variables (Maternal Education Level, Maternal Occupational Prestige, Family Structure, and Welfare Recipient Status) were summed to create a Distal Cumulative Risk score ($M = 2.48$, $SD = 1.22$, range = 0 - 4), and three variables (Parent Experience of Assault, Family Stress, and Family Mental Illness) were summed to create a Proximal Cumulative Risk score ($M = .55$, $SD = .81$, range = 0 - 3).

Descriptive statistics and correlations

The descriptive statistics for all study variables are presented in *Table 3* (p.38). Additionally, bivariate correlations were computed for the study variables, and the results are shown in *Table 4* (p. 39). Several significant correlations emerged. Best Friend Closeness and Best Friend Conflict were positively correlated ($r = .16$, $p < .05$), as were Acquaintance Closeness and Acquaintance Conflict ($r = .15$, $p < .05$) and Best Friend Closeness and Acquaintance Closeness ($r = .27$, $p < .01$). Acquaintance Closeness was negatively correlated with Hostile Attribution Bias ($r = -.18$, $p < .05$) and Best Friend Conflict ($r = -.19$, $p < .05$).

We also performed bivariate correlations for the abuse and control groups separately, and the results are presented in *Table 5* (p. 40). For the control group, Acquaintance Conflict was positively correlated with Best Friend Conflict ($r = .26$, $p < .05$) and Acquaintance Closeness ($r = .22$, $p < .05$). For the abuse group, several

significant correlations emerged. Acquaintance Conflict was negatively correlated with Best Friend Closeness ($r = -.22, p < .05$). Acquaintance Closeness was negatively correlated with Hostile Attribution Bias ($r = -.27, p < .01$) and Best Friend Conflict ($r = -.26, p < .01$) but was positively correlated with Best Friend Closeness ($r = .28, p < .01$). Lastly, Best Friend Closeness was negatively correlated with Distal Cumulative Risk ($r = -.21, p < .05$).

T-tests

A t-test was performed to determine gender differences among the study variables. No significant gender differences emerged except that, compared to boys ($M = 3.97, SD = .89$), girls ($M = 4.33, SD = .72$) reported higher Acquaintance Conflict [$t(198) = 2.84, p < .01$].

We also performed a t-test to determine if there were any differences between the abuse and control groups for all study variables, and a few significant results emerged. The abuse group ($M = .75, SD = .91$) had higher Proximal Cumulative Risk than the control group [$M = .35, SD = .64; t(198) = 3.58, p < .001$]. The abuse group ($M = 2.67, SD = 1.26$) also had higher Distal Cumulative Risk than the control group [$M = 2.28, SD = 1.15; t(198) = 2.29, p < .05$]. Lastly, the abuse group ($M = 4.24, SD = .72$) reported higher Acquaintance Conflict than did the control group [$M = 3.95, SD = .95; t(198) = 2.43, p < .05$].

ANOVA

A one-way between subjects ANOVA was performed to compare the effect of participant race on all study variables. The results indicate that there were no differences between racial groups for any variables except for Distal Cumulative Risk [$F(3, 192) = 5.85, p < .001$]. Post-hoc comparisons using the Tukey HSD test indicate that Hispanic participants ($M = 2.80, SD = 1.16$) had significantly higher Distal Cumulative Risk scores than Black ($M = 2.28, SD = 1.21; p < .05$) and White ($M = 1.58, SD = 1.16; p < .01$) participants. There were no significant differences in Distal Cumulative Risk between Black and White participants ($p = .227$).

Main Analysis

Path Analysis

To test our main hypotheses, we performed path analyses using IBM® SPSS® Amos™ 22 software. Our original multigroup model tested the abuse and control groups separately, and the standardized regression weights for each group are presented in *Figure 1* (p. 41) and *Figure 2* (p. 42) respectively. A few significant pathways emerged for the abuse group, and the chi-square test for this two-group model [$N_1=100$ and $N_2=100, \chi^2(21) = 93.24, p < .001$] was significant, which indicates poor model fit. Furthermore, an examination of other fit indices, GFI = .90, RMSEA = .13 (range = .11 - .16), SRMR = .10, and CFI = .00, indicate poor model fit. Thus, we trimmed variables in the model. The following variables, which did not have any significant pathways, were dropped from further path analysis: Proximal Cumulative Risk, Best Friend Conflict, and

Acquaintance Conflict. Additionally, the non-significant path from Distal Cumulative Risk to Hostile Attribution Bias was also dropped, although both variables remained in the new model as exogenous variables.

The new, multigroup model tested whether Distal Cumulative Risk and Hostile Attribution Bias predicted Best Friend Closeness and Acquaintance Closeness. The standardized regression weights for the new model are presented in *Figure 3* (abuse group; p. 43) and *Figure 4* (control group; p. 44). Our sample size ($n = 200$) is large enough to make inferences about statistically significant pathways as well as to detect model fit (Kenny, 2014). Like the original model, the chi-square test [$N_1=100$ and $N_2=100$, $\chi^2(8) = 17.86$, $p < .05$] was significant. However, the GFI = .96 indicates a good fit, the RMSEA = .08 (range = .03 - .13) indicates a mediocre fit (MacCallum, Browne, & Sugawara, 1996), and the SRMR = .08 indicates an acceptable fit (Hu & Bentler, 1999). In contrast, the CFI = .49 is below the acceptable threshold of .95 (Hu & Bentler, 1999). The overall pattern of fit indices suggests that the final model has acceptable fit.

Research Aim I: To examine whether distal and proximal cumulative risk predict best friendship quality

Our original model found no support for hypotheses *a – c*. Proximal Cumulative Risk did not predict Best Friend Closeness or Best Friend Conflict in either the abuse or control groups. Instead, contrary to what we expected, Distal Cumulative Risk negatively predicted Best Friend Closeness in the abuse group only, such that higher Distal Cumulative Risk predicted lower Best Friend Closeness in the final path model.

Research Aim II: To examine whether distal and proximal cumulative risk predict acquaintance relationship quality

Contrary to our expectations for hypotheses $d - g$, Proximal Cumulative Risk in the final model did not predict Acquaintance Closeness or Acquaintance Conflict in the abuse or control groups. However, as we expected, Distal Cumulative Risk did not predict Acquaintance Closeness and Acquaintance Conflict.

Research Aim III: To examine the mediating role of hostile attribution bias

Hypotheses $h - j$ were not supported in the original or final path models. Hostile Attribution was not a significant mediator between Proximal Cumulative Risk and either of the conflict variables (best friend and acquaintance), although surprisingly, Hostile Attribution Bias did negatively predict Acquaintance Closeness in the abuse group only, such that higher Hostile Attribution Bias predicted lower Acquaintance Closeness in the final model.

Table 2

Correlations for Distal and Proximal Cumulative Risk Variables

Variables	1	2	3	4	5	6	7
1. Maternal Education Level	-----						
2. Maternal Occupational Prestige	.35**	-----					
3. Family Structure	.10	.04	-----				
4. Welfare Recipient Status	.34**	.19**	.31**	-----			
5. Parent Experience of Assault	-.23**	.06	.12	.00	-----		
6. Family Stress	-.01	-.03	.18*	.14	.20**	-----	
7. Family Mental Illness	.05	-.06	.03	-.02	-.15*	.35**	-----

Note. * $p < .05$, ** $p < .01$

Table 3

*Mean Scores and Standard Deviations for All Study Variables
(n = 200)*

Variables	Mean	Standard Deviation	Range
Proximal Cumulative Risk	.55	.81	0 - 3
Distal Cumulative Risk	2.48	1.22	0 - 4
Hostile Attribution Bias	.70	.68	0 - 2
Best Friend Closeness	3.39	.92	1 - 5
Best Friend Conflict	4.34	.72	1 - 5
Acquaintance Closeness	2.26	.84	1 - 5
Acquaintance Conflict	4.10	.85	1 - 5

Table 4
Correlations Among Study Variables

	1	2	3	4	5	6	7
1. Proximal Cumulative Risk	-----						
2. Distal Cumulative Risk	.03	-----					
3. Hostile Attribution Bias	.01	.03	-----				
4. Best Friend Closeness	.01	-.10	.03	-----			
5. Best Friend Conflict	-.02	.06	-.01	.16*	-----		
6. Acquaintance Closeness	.04	.02	-.18*	.27**	-.19**	-----	
7. Acquaintance Conflict	-.05	-.00	-.10	-.13	.12	.15*	-----

Note. * $p < .05$, ** $p < .01$

Table 5

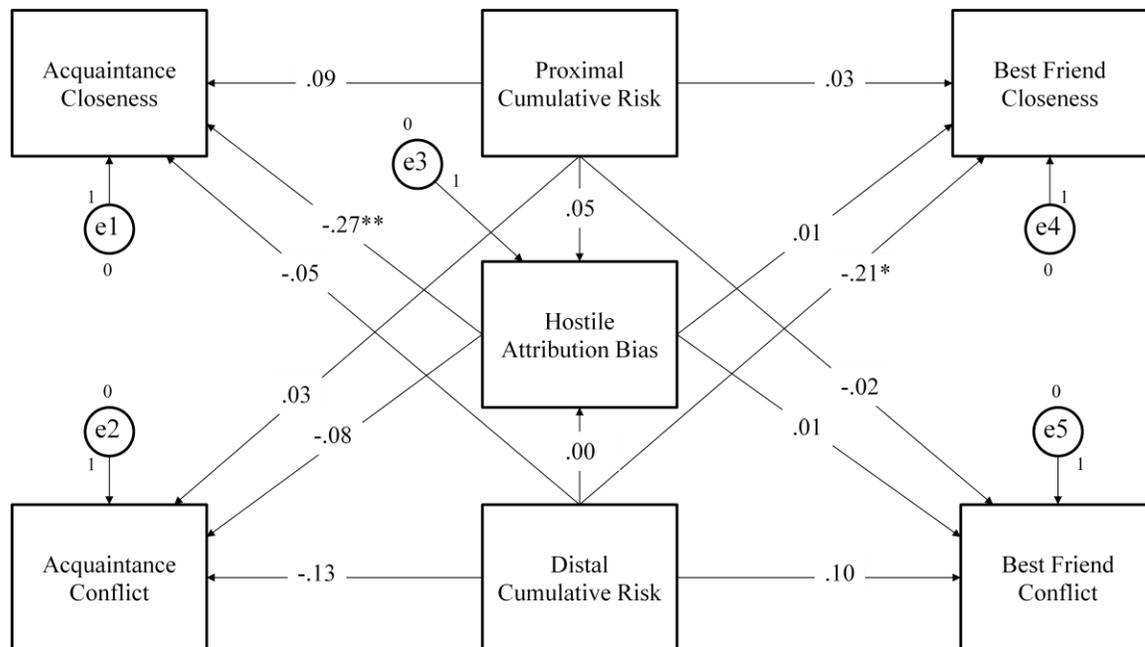
Correlations Among Study Variables by Group

Variables	1	2	3	4	5	6	7
1. Proximal Cumulative Risk	-----	-.16	.06	.07	-.04	.10	.04
2. Distal Cumulative Risk	.19	-----	-.01	-.21*	.10	-.06	-.11
3. Hostile Attribution Bias	-.09	.06	-----	.01	.00	-.27**	-.07
4. Best Friend Closeness	-.15	-.05	-.08	-----	.19	.28**	-.22*
5. Best Friend Conflict	.03	.05	-.03	.14	-----	-.26**	.00
6. Acquaintance Closeness	-.03	.10	-.08	.28**	-.12	-----	.11
7. Acquaintance Conflict	-.10	.19	-.13	.03	.26*	.22*	-----

Note. The physical abuse group is above the diagonal, and the control group is below the diagonal. * $p < .05$, ** $p < .01$

Figure 1

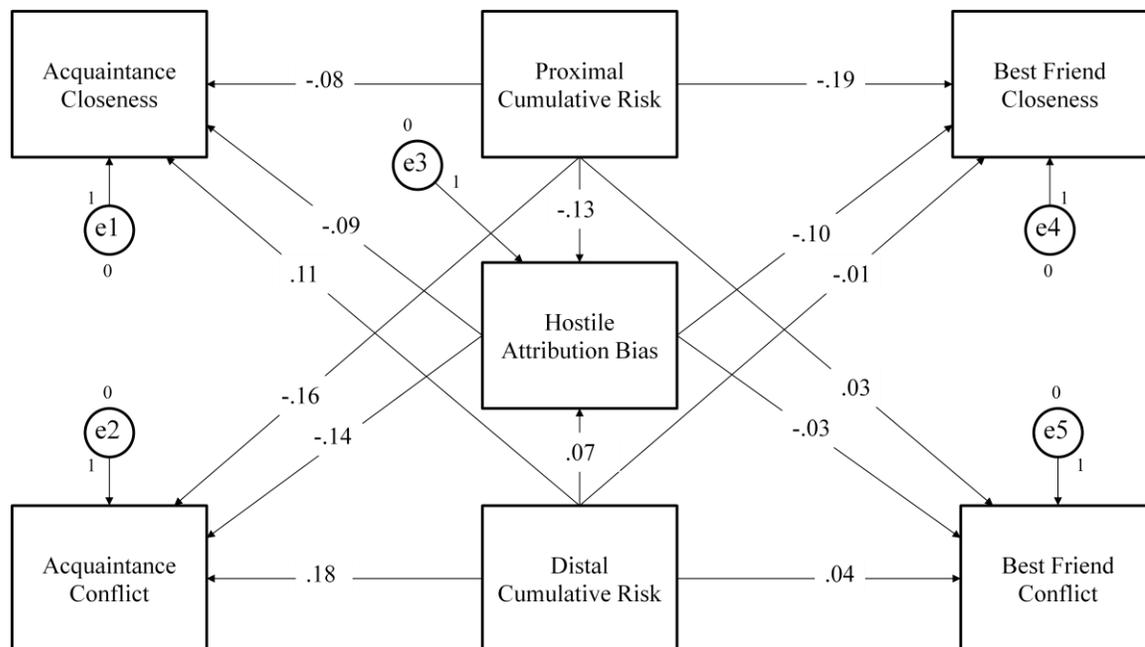
Original Path Model for Abuse Group with Standardized Regression Weights



Note. $n = 100$; $X^2(21) = 93.24, p < .001$; * $p < .05$, ** $p < .01$

Figure 2

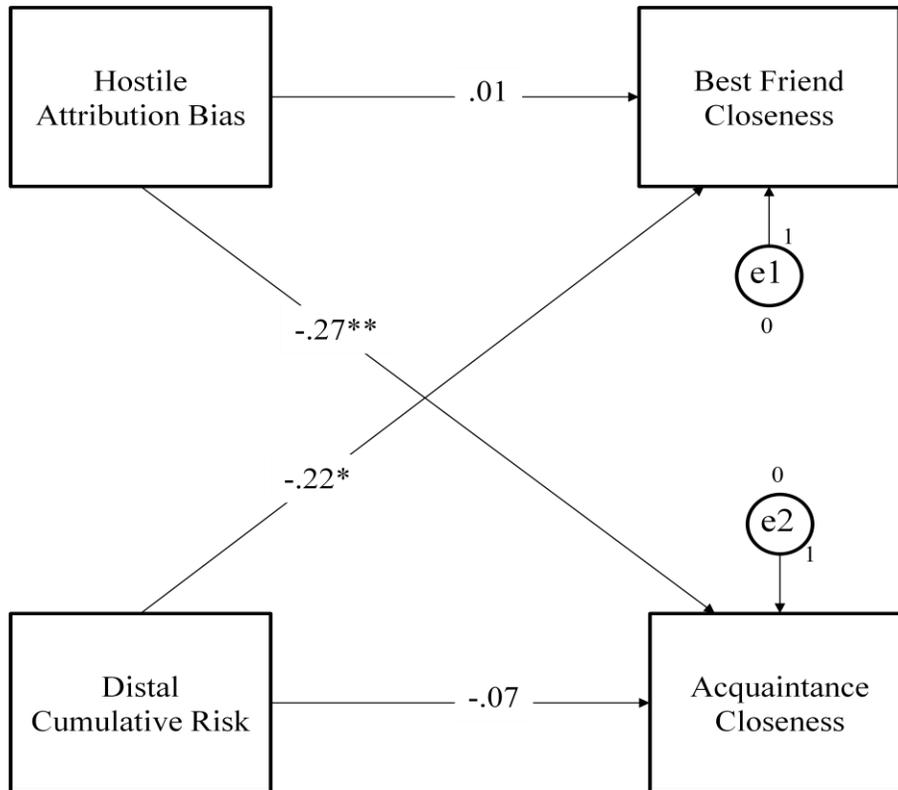
Original Path Model for Control Group with Standardized Regression Weights



Note. $n = 100$; $X^2(21) = 93.24$, $p < .001$

Figure 3

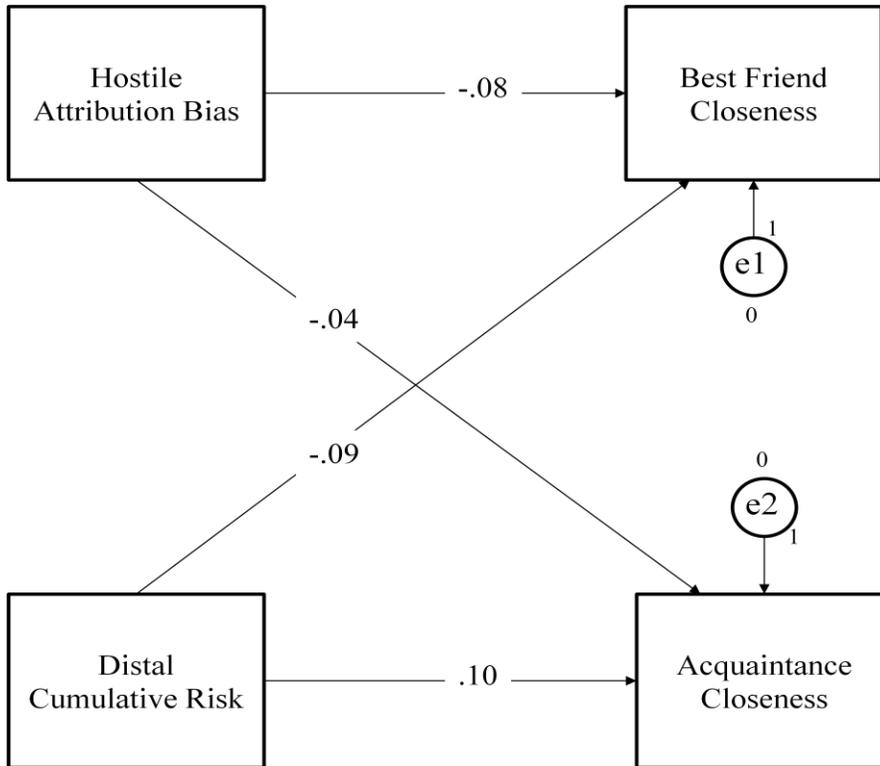
Final Path Model for Abuse Group with Standardized Regression Weights



Note. $n = 100$; $X^2(8) = 17.86$, $p < .05$; * $p < .05$, ** $p < .01$

Figure 4

Final Path Model for Control Group with Standardized Regression Weights



Note. $n = 100$; $X^2(8) = 17.86$, $p < .05$

CHAPTER 5

Discussion

The quality of peer relationships among of physically abused early adolescents is under-examined in the developmental psychology literature, which to date, has focused heavily on peer rejection, socio-metric rankings, and social competence within the classroom (e.g., Salzinger et al., 1993). Furthermore, high-risk, minority youth are under-examined in the peer relationship literature as a whole. The purpose of this study was to examine the quality of two types of peer relationships, best friendships and acquaintance relationships, using a sample of high-risk, Black and Hispanic young adolescents that includes a physical abuse group and non-abused control group. We were also interested in whether two types of cumulative risk, proximal and distal, differentially predicted our peer relationship quality variables and whether hostile attribution bias mediated any relation between our risk and peer relationship variables.

We hypothesized that proximal cumulative risk would predict *higher* best friend closeness in our abuse group, but *lower* best friend closeness in our control group. We based these hypotheses on a compensatory model of social development (Way & Pahl, 2001; Way & Greene, 2006), which suggests that abused adolescents may rely more on their peers for support when their relationships with family members are strained. Furthermore, we hypothesized that high proximal, but not distal, cumulative risk would predict higher best friend and acquaintance conflict and lower acquaintance closeness in both the abuse and control groups due to our belief that high proximal cumulative risk indicated socioemotional discord within the home. Lastly, we hypothesized that hostile

attribution bias would mediate any observed link between proximal cumulative risk and the conflict variables among the abuse group only. In sum, although many of our hypotheses were not supported, we found some significant pathways of interest. Distal cumulative risk negatively predicted best friend closeness in the abuse group only, and hostile attribution bias negatively predicted acquaintance closeness in the abuse group only. These findings and their implications are discussed in further detail below.

Proximal Cumulative Risk

Contrary to our expectations, proximal cumulative risk did not predict any of our study variables (hostile attribution bias, best friend closeness and conflict, acquaintance closeness and conflict). Therefore, the findings do not support our compensatory model of social support among participants we considered the most at-risk in our study, physically abused adolescents. Although prior research on high-risk, minority youth is limited, we based our predictions on Way and Pahl's (2001) study, which found that low-income Black, Hispanic, and Asian-American adolescents' report of low maternal support predicted higher friend support a year later. A follow-up study of the same participants four years later revealed that those who continued to make the sharpest increases in friend support over time were those that reported the lowest levels of family support at Time 1 (Way & Greene, 2006). We hypothesized a similar relation between high proximal cumulative risk and high best friend closeness because we conceptualized proximal cumulative risk as an indicator of a low-support family environment, particularly among our participants who experienced physical abuse. Our measure of

familial support consisted of maternal-reported indicators of socioemotional risk, and perhaps adolescents' own perceptions of familial support should be taken into consideration when examining a compensatory model of social support among individuals who are at-risk.

Developmental differences between our sample and the sample examined by Way and colleagues may also explain why our findings do not support a compensatory model of social support. Our sample consisted of early adolescents ($M = 10.5$ years, $SD = .96$), whereas the sample examined by Way and colleagues consisted of adolescents who had recently entered high school ($M = 14.3$ years at Time 1; Way & Pahl, 2001; Way & Greene, 2006). Around age 13, friends become more important than parents in fulfilling adolescents' needs for personal validation and feeling important (Buhrmester & Fuhrman, 1987; Buhrmester, 1990). Early adolescence may be a period of time in which at-risk children are developing social skills within their best friendships but do not yet perceive their best friends as someone that they can rely on for personal validation and support. Therefore, best friendship closeness may not vary as a function as proximal cumulative risk until children reach an age in which they view best friends as a primary source of support. Longitudinal research on high-risk youth that spans from early to late adolescence would help determine the developmental implications of a compensatory model.

Other concerns about our measurement of proximal cumulative risk variables may, in part, explain why we did not find a significant pathway from proximal cumulative risk and our peer conflict variables. If cumulative risk harms child functioning by increasing allostatic load, then it may be necessary for children to

experience the proximal cumulative risk factors in our study as stressors. For one of our proximal cumulative risk variables, family stress, we did not ascertain whether children had direct knowledge of the family stress events (e.g., parental police contact, miscarriage or abortion). Similarly, for parental experience of assault, we were unable to ascertain whether the child had directly witnessed the event(s). However, research on domestic violence in major U.S. cities reveals that approximately one-third of domestic violence incidents reported to police occur in the presence of 6-11 year old children in the home (Fantuzzo, Boruch, Beriama, Atkins, & Marcus, 1997). The rate is even higher in studies that rely on child-report of exposure rather than crime statistics (see Edleson, 1999 for a review), presumably because many domestic violent incidents are unreported. Therefore, although it is likely that many of our study participants whose parents reported a recent experience of assault had direct exposure to the incident(s), we cannot rule out the possibility that they had no knowledge of the event(s), and therefore, did not experience any subsequent stress.

Alternatively, the negative developmental impact of parental experience of assault and other family stress events may not require direct exposure, and our lack of proximal cumulative risk findings may indicate that proximal cumulative risk does not impair children's peer relationships. There is some evidence to suggest that the socioemotional variables in our proximal cumulative risk scores may indirectly impact child functioning by negatively impacting parents' parenting abilities and practices (see Holt, Buckley, & Whelan, 2002 for a review).

Qualitative research has found that some mothers who experience intimate partner violence report diminished emotional availability and misplaced anger towards their

children (Levendosky, Lynch, & Graham-Bermann, 2000). Similarly, research on mother-infant relationships has found a link between mothers' interpersonal stress with a romantic partner and insensitive parenting (Pianta & Egeland, 1990). Given that our sample is high-risk and exposed to a great number of stressors that are measured in our distal cumulative risk variable, it may be that proximal cumulative risk does not negatively impact children's social development apart from the negative effects of distal cumulative risk. The stress associated with the SES risk variables (e.g., maternal occupational prestige) in our distal cumulative risk score may affect parenting in a similar manner and in turn, negatively affect children's peer relationships. Indeed, we found a significant pathway from distal cumulative risk and best friend closeness among the abuse group. Thus, when examining a high-risk sample, a distinction between proximal and distal cumulative risk may not be warranted as we initially proposed if the means by which proximal cumulative risk impacts child development is through parenting practices that are negatively affected by parental stress.

Distal Cumulative Risk

To our surprise, distal cumulative risk negatively predicted best friend closeness in the abuse group. One explanation for this finding is that stress related to low socioeconomic status negatively impacts parenting, and physically abused children then incorporate their negative experiences with their parent into their internal working model of relationships (Crittenden & Ainsworth, 1989). Lower best friend closeness, therefore, is an indirect result of the effects of parenting within a high-stress context.

Alternatively, lower best friend closeness may be the result of parental socialization messages of mistrust. Many Black and Hispanic parents promote direct messages of mistrusting others because of concerns about discrimination (Hughes & Chen, 1997; Liu & Lau, 2013). One study found that Black parents living in economically disadvantaged and racially segregated neighborhoods were most likely to promote messages of mistrust to their children (Caughy, Nettles, O'Campo & Lohrfink, 2006). Although these messages of mistrust are typically with regard to non-familial authority figures, it is possible that children who have internalized these messages generalize mistrust to their non-familial peers as well. In addition to direct socialization messages, young adolescents may learn to mistrust others by observing their parents social relationships (or lack thereof) with non-familial others, although research examining this proposed mechanism is lacking. Physically abused children with high distal cumulative risk may learn to mistrust others, including their best friends, because they have been socialized by their parents to be leery of outsiders to the family.

The experience of physical abuse and the events surrounding the CPS investigation may further perpetuate the mistrust of non-familial members among children with higher distal cumulative risk. Although we do not have information about the perpetrators of abuse in the present sample, it is possible that a significant portion of the physically abused children in our study were victimized by individuals outside of the family. Recent statistics on child maltreatment cases in New York reveal that 14% of physical abuse cases involved non-familial perpetrators and 33% involve parents' significant other as perpetrators (Lawitz, 2013). For these individuals, the incident(s) of abuse may be the primary reason for lower best friend closeness if mistrusting outsiders

is indeed the driving mechanism. Furthermore, children's interactions with CPS workers and foster care guardians may also lead to the mistrust of outsiders. Many of the physically abused children in our sample may have been removed from their homes and placed in foster care temporarily. Children may attribute being removed from their family to disclosing information about physical abuse to a CPS case worker or other non-familial professionals, and it is plausible that this experience might negatively impact children's ability and desire to be close to their best friends. Additionally, one study found that placement in foster care with non-familial guardians is linked to worse developmental outcomes compared to children who were placed into familial foster care (Lawrence, Carlson, & Egeland, 2006). Although children's peer relationships were not assessed in that study, the findings lend support to our suggestion that increased mistrust of non-familial others may be the mechanism that explains our study's finding that physical abuse, distal cumulative risk, and lower best friend closeness are related.

Hostile Attribution Bias

We expected that hostile attribution bias would mediate a proposed link between proximal cumulative risk and our conflict variables (best friend and acquaintance) among children who were physical abused. Instead, we found a direct negative pathway from hostile attribution bias to acquaintance closeness among the abuse group. There are several possible explanations for our unexpected findings.

First, hostile attribution bias may be related to the difficulties that physically abused children typically have with forming friendships, as many studies indicate that

they face more peer rejection and have fewer reciprocal friendships (e.g., Rogosch & Cicchetti, 1994). The process may be transactional such that physically abused children with hostile attribution bias respond negatively to their peers' ambiguous hostility cues, which in turn leads to rejection from their peers and subsequent lower perceptions of closeness to their peer acquaintances. However, we did not find a link between hostile attribution bias and best friend closeness, which suggests that hostile attribution bias may not affect physically abused children's perception of closeness to peers who accept them.

The different findings for best friend and acquaintance closeness may be due to an established familiarity between best friends, but not acquaintances, which reduces the deleterious effects of hostile attribution bias on physically abused children's perceived closeness with peers. Hostile attribution bias that is associated with physical abuse may only impact relationships with unfamiliar acquaintances because there is more perceived ambiguity in their actions compared to the actions of their best friends, with whom they have had more opportunities to observe their behavioral repertoire (thus reducing behavioral ambiguity). In other words, physically abused children with hostile attribution bias may give their best friends the benefit of the doubt in ambiguously hostile situations due to their previous positive experiences in the friendship, but they do not afford this benefit towards their less familiar peer acquaintances.

Our prediction that hostile attribution bias would be linked to best friend conflict among the physical abuse group was based on previous research that found a relation between physical abuse and high levels of conflict with best friends (Parker & Herrera, 1996; Howe & Parke, 2001). We proposed that hostile attribution may, in part, account for the observed negative and aggressive behaviors exhibited by physically abused

children towards their best friend in these previous studies. However, the lack of findings is consistent with previous research that has linked adolescents' hostile attribution bias with mistrust of others, but not with feelings of anger, which is an emotion associated with conflict (Calvete & Orue, 2011). It has also been demonstrated in prior research that hostile attribution bias is not always linked to behavioral problems; for some children, hostile attribution bias is instead linked to internalizing symptoms, like depression (Quiggle, Garber, Panak, & Dodge, 1992). Therefore, hostile attribution bias may not be the mechanism that can explain previously established links between physical abuse and best friend conflict because for some adolescents, hostile attribution bias yields internalizing symptoms and not emotions and behaviors associated with peer relationship conflict.

It is worth noting that Bolger et al. (1998) also did not find a relation between physical abuse and best friend conflict in their longitudinal study of childhood friendships. Like the present study, the authors used a self-report measure of conflict with best friends. As such, the lack of consistent findings between physical abuse and best friend conflict may be due to a mechanism that has yet to be identified by researchers or may be due to physically abused children's inability to recognize, and therefore self-report, levels of conflict within their peer relationships.

CHAPTER 6

Limitations

Our study is not without limitations. For our measure of physical abuse, we relied solely on Child Protective Services (CPS) records for determining abuse status. CPS records are useful because they present researchers with a variable that is substantiated by trained social services professionals. However, systemic biases in CPS cases have been found such that Black mothers have disproportionately high report and substantiation rates (Hampton & Newberger, 1985; Eckenrode, Powers, Doris, Munsch, & Bolger, 1988), although more recent studies have failed to find a consistent pattern of racial biases in reporting or substantiation when controlling for other sociodemographic variables, such as community poverty rates (Drake, & Zuravin, 1998; Ards, Myers, Chung, Malkis, & Hagerty, 2003; Drake, Lee, & Jonson-Reid, 2009). Our use of CPS records is further limited because we did not include in our analysis any information about the circumstances of the substantiated physical abuse incident(s), such as severity, chronicity, age of child at the time of the incident(s), and the child's relationship to the perpetrator(s), all of which may differentially impact adolescent development. Nonetheless, CPS records are modestly correlated with other sources of physical abuse data and are a significant predictor of developmental outcomes (Stockhammer et al., 2001; Runyan et al., 2005).

The fact that more than half (60%) of the participants in our physical abuse group also had CPS-substantiated cases of parental neglect deserves consideration when interpreting our results. It may be that our findings regarding peer relationships in the

physical abuse group are the results of the additive effects of physical abuse and neglect, which supports a cumulative risk perspective and is consistent with research examining the additive effects of poly-victimization on child and adolescent development (Manly, Cicchetti, & Barnett, 1994; Ney, Fung, & Wickett, 1994). However, Salzinger and colleagues, who collected the data for this study, have noted elsewhere that the CPS neglect sub-category of “inadequate guardianship,” which characterizes more than 80% of the neglect cases in our sample, “...is often used, in practice [by New York City CPS workers], to make a family eligible for services,” (p. 822, Salzinger et al., 2001). This statement invokes the possibility that neglect may be unduly substantiated in our sample and further highlights the limitations of relying solely on CPS records for determining participants’ abuse status.

We also have some limitations regarding our statistical analyses. First, our path analyses yielded inconsistent indices of model fit. Although most of the values of our fit indices meet the minimal criteria for acceptability (GFI, RMSEA, and SRMR), some do not (Chi Square and CFI). Therefore, the results of our path analyses should be interpreted with caution. Second, because all of the variables in our path analyses were collected at the same time, we cannot infer a causal relation between our independent and dependent variables. We hope that the analysis of cross-sectional data in our study provides a foundation for future longitudinal research that can determine whether cumulative risk impairs the peer relationships of abused and non-abused early adolescents.

CHAPTER 7

Conclusion

The current study advances our understanding of peer relationships during early adolescence. We examined a unique sample of high-risk, physically abused early adolescents along with a comparatively high-risk, but non-abused, sample. Often, studies on the effects of child maltreatment on development either 1) do not include a non-abused control group (e.g., Stockhammer et al., 2001; Raviv et al., 2010), 2) include a non-abused control group who is more socioeconomically advantaged than the abuse group (e.g., Claussen & Crittenden, 1991), or 3) use a convenience sample of participants who have experienced abuse but are not socioeconomically at-risk (e.g., Gross & Keller, 1992). This has limited our understanding of the effects of physical abuse on child development within the context of high-risk environments. The findings of the present study provide some insight into the social development of this under-examined population. More specifically, for our physically abused youth, we have evidence suggesting that hostile attribution bias may be related to less perceived closeness with peer acquaintances, but not best friends, whereas socioeconomic cumulative risk may be related to less perceived closeness with best friends, but not peer acquaintances.

In the future, we hope other researchers will explore the putative benefits of high-quality peer relationships, as the longitudinal implications of early adolescent peer relationship quality on later functioning among those most at-risk are not yet clear in the literature. Furthermore, it would be interesting to determine if poor peer relationships during early adolescence increase one's allostatic load along with other cumulative risk

factors. Lastly, we hope that our findings will help inform prevention and intervention research aimed to assist physically abused children.

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CURRICULUM VITA

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EDUCATION

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| Ph.D. in Psychology (Developmental)
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University of New Orleans | 2006 |

PUBLICATIONS

Goff, P.A., Jackson, M.C., Di Leone, B.A.L., Culotta, C.M., & DiTomasso, N.A. (2014). The essence of innocence: Consequences of dehumanizing Black children. *Journal of Personality and Social Psychology, 106*, 526-545.

Culotta, C.M. & Goldstein, S.E. (2008). Adolescents' aggressive and prosocial behavior: Associations with jealousy and social anxiety. *Journal of Genetic Psychology, 169*, 21-33.

SELECTED PRESENTATIONS

Culotta, C.M., & Bandon, A.Y. (2011, May). *Children's best friendships as a context for the development of prosocial behavior*. Poster presented at the annual convention of the Association for Psychological Science, Washington, D.C.

Culotta, C.M., & Bandon, A.Y. (2011, March). *Effects of best friend delinquency on children's friendship quality: The moderating role of unsupervised time with peers*. Poster presented at the biennial meeting of the Society for Research in Child Development, Montreal, QC, Canada.