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Growth curve modeling was used to examine the influence of physical punishment (PP) on the trajectory of externalizing behavior problems in a community sample of children across the ages of 5 to 10. In addition, negative affect (NA), emotional climate (EC), race, and socioeconomic status were examined as moderators. Results indicated that over time, externalizing behavior problems decreased, though considerable individual variability in the pattern of change was observed. Initial levels of behavior problems were predicted by PP and NA. The PP x EC interaction approached significance. Changes in this trajectory were predicted by PP. Interactions between PP x EC and PP x SES also trended towards significance. Overall, the trajectory of externalizing behavior problems over time was not predicted by the experience of PP alone, but rather that other factors influenced this association.

PHYSICAL DISCIPLINE AND EXTERNALIZING BEHAVIOR PROBLEMS:
MODERATING FACTORS

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CHAPTER I

INTRODUCTION

Clinical and developmental psychologists have used the term *externalizing* to describe one of the two major dimensions of childhood psychopathology. The externalizing dimension includes aggressive and delinquent behavior, attention problems, and hyperactivity. These descriptors have been used to characterize types of children and to place children on a continuum based on the severity of their symptoms. Measures designed to assess these broader categories have been useful tools when examining behavioral and emotional symptoms in both normative and clinical samples. Numerous studies have used empirically-derived assessments to examine the normative development of emotional and behavioral syndromes, identify children at risk, and assess treatment efficacy. This work, as well the use of more sophisticated analytical techniques, has lead to a better understanding of the normative and non-normative development of these behavior patterns in young children, as well as the risk factors and outcomes associated with them.

Despite these advances in the understanding of the development of externalizing behavior problems in young children, understanding the factors that contribute to the persistence of externalizing symptoms across childhood has been largely overlooked until recently. Throughout preschool and early childhood, children begin to test different ways

of coping with their emotions, interacting with adults, testing limits, and navigating the social world and peer interactions more independently. Typically, children's early development includes a moderate level of disruptive behavior which normatively decreases between ages two and five as children learn more regulatory skills and can better cope with developmental challenges, meaning that the majority of children learn how conform to parental and social guidelines of behavior by the time they enter school (Campbell, 2002; Loeber and Hay, 1997; Owens & Shaw, 2003). However, numerous studies have found that there is a subset of children who fail to navigate these periods effectively and continue to exhibit symptoms of externalizing behavior problems into later childhood.

When externalizing behavior problems remain stable, these children may experience severe psychopathology in adolescence and adulthood (Broidy et al., 2003; Tremblay, 2000). For example, children who did not develop appropriate regulation skills early in development continued to have trouble regulating aggression and antisocial behavior throughout late childhood and adolescence, especially when they were physically aggressive at school-entry age (Broidy et al., 2003). During the early and middle childhood periods, children are also challenged with new, normative challenges including language and cognitive development and emotion regulation. Research has shown that when these normative developmental tasks were delayed by persistent externalizing behavior problems, children exhibited problems with parents, peers, teachers, and school success later in childhood (Coie, Lochman, Terry, & Hyman, 1992).

Empirical evidence has also shown that externalizing behaviors that persist beyond the normative time frame in early childhood were predictive over time and showed moderate stability into later childhood, indicating that non-normative levels of behavior problems tend to predict a continued pattern of increased externalizing behavior (Owens and Shaw, 2003). Accordingly, middle to late childhood is an appropriate developmental period to assess when examining the nature of persistent externalizing psychopathology. Given the long term negative effects of such behaviors, the current study aimed to identify factors that contribute to this stability versus change in order to better understand developmental trajectories and assist children in learning to regulate their behavior independently.

When answering questions about factors that shape the development of maladaptive versus adaptive developmental pathways, one must consider multiple levels of influences and outcomes across time rather than a snapshot of punishment and behavior at one time point (Rutter & Sroufe, 2000). Specifically, similar pathways may lead to different outcomes (multifinality). For example, siblings who both experience physical punishment may have opposite responses to that experience. Contradictory empirical findings thus far suggest that these outcomes may be influenced by individual factors and the context in which the physical punishment occurs. Using the framework of developmental psychopathology (DP) to conceptualize this association, it is essential to identify the contextual and person-centered factors that contribute to the multifinality of developmental pathways. According to the developmental psychopathology framework, adopting an interactionist approach allows for the examination of influences from

environmental and cultural factors, parenting factors, as well as factors that are unique to the child (Bronfenbrenner, 1979, 1998). For example, physical punishment may not be the sole explanation for maladaptive outcomes related to punishment style; rather other risk factors may contribute to the likelihood that, for some children, physical punishment is more detrimental than effective.

CHAPTER II

REVIEW OF THE LITERATURE

Physical Punishment and Externalizing Behavior Problems

An assessment of the normative development of externalizing behaviors over time allows for identification of risk factors that predict those children who are more likely to have difficulty developing age-appropriate affective regulation skills and continue to exhibit externalizing behaviors beyond the normative developmental period. One risk factor that may contribute to the stability of behavior problems over time that has been examined in numerous cross-sectional studies is the type of punishment that caregivers use in an attempt to modify undesirable behavior. The field of psychology defines punishment as the procedure of following an unwanted behavior with something aversive, or any event that decreases the frequency of that behavior (Azrin, Hake, & Holz, 1965; Peterson & Premack, 1971; Rachlin & Baum, 1969). This may include the removal of a reinforcing stimulus or the delivery of an aversive stimulus. Of particular interest to researchers has been the use of physical punishment as a discipline technique. For the purposes of the current discussion, physical punishment can be defined as the use of physically induced pain by striking a child on the buttocks or extremities with an open hand, without inflicting physical injury, with the intention to modify or correct a child's

behavior (Strauss, 2001). Physical punishment is the application of an aversive stimulus for the purpose of decreasing unwanted behaviors, and it continues to be a commonly used form of behavior management (Strauss, 2001).

Although this form of punishment is common (Ateah & Parker, 2002), studies examining the use of physical discipline as an effective strategy for modifying child behavior have produced mixed results (for reviews, see Gershoff, 2002; Hicks-Pass, 2009; Larzelere & Kuhn, 2005). There are studies that have shown that all physical punishment, despite severity and context, is detrimental to child development and will only exacerbate the negative behaviors that it aims to deter (Aucoin, Frick, & Bodin, 2006; Hicks-Pass, 2009; Mulvaney, & Menert, 2007). Other studies, however, have found that non-abusive physical punishment is no more detrimental than non-physical discipline alternatives (Benjet, & Kazdin, 2002; Nicholson, Fox, & Johnson 2005).

Physical Punishment and Maladaptive Outcomes. Several programs of research have provided evidence that suggests that the experience of physical punishment is associated with maladaptive outcomes (Bates, Pettit, Dodge, & Ridge, 1998; Rubin, Burgess, Dwyer, & Hastings, 2003; Leve et al., 2005). Specifically, research in this area focused on the role of socialization through observational learning (Denham et al., 2000; Leve, 2005; Luthar, 2006; Smith et al., 2004) when examining the various outcomes associated with physical punishment. These studies found that through observational and social learning, physical punishment had harmful effects on several aspects of a child's development, including their understanding, experience, expression, and future regulation

of behaviors and emotions (Eisenberg, Cumberland, & Spinrad, 1998). For example, the strategies caregivers used to manage behavior—especially unwanted behavior—have been found to be predictive of various social-emotional outcomes such as increased externalizing behavior problems and poor school adjustment (Eisenberg, Cumberland, & Spinrad, 1998). These studies suggested that the way in which caregivers demonstrate their own emotion regulation through their responses to a child's undesirable behavior had lasting influences on the child's socialization and subsequent developmental outcomes (Denham, et al., 2000). For instance, if children experience physical discipline, they may be more likely to exhibit more aggressive or violent behavior because they have learned that aggression is an acceptable way to cope with distressing situations. One explanation for this argument is that children generalize these experiences into their own behavioral repertoire, so they are more likely to act aggressively themselves (Denham et al., 2000). Therefore, many researchers concluded that physical punishment always led to negative outcomes.

Physical Punishment and Normative Outcomes. Alternatively, empirical evidence has also suggested that physical punishment is associated with normative outcomes. In a review of studies (Larzelere & Kuhn, 2005), physical punishment was found to result in more immediate compliance and lower rates of antisocial behaviors than ten of thirteen alternative forms of punishment including time-out, verbal reprimands, and reasoning. In addition, Larzelere & Kuhn (2005) reported that, based on effect sizes, if physical punishment increased externalizing symptoms, it did so to an equal or lesser degree than

alternative forms of punishment. More specifically, there was evidence that the use of physical punishment was not associated with unique negative child outcomes unless it was abusive or implemented in an inconsistent manner (Aucoin, Frick, & Bodin, 2006; Baumrind, Larzelere, & Cowen, 2002; Benjet & Kazdin, 2003). In these studies, the positive association between conduct problems and physical punishment was largely confined to families who were also high on other measures of overall risk. Specifically, Deater-Deckard, Ivy, and Petrill (2006) reported that the link between physical punishment and problematic child outcomes was strongest when the mother-child relationship lacked warmth and the family was classified as lower socioeconomic status. Therefore, these findings indicate that the experience of physical punishment alone is not sufficient to explain the variety of developmental outcomes that children who experience this discipline strategy may face. Rather, there are several other environmental and individual factors that may contribute the children's negative outcomes, rather than the act of a single discipline strategy alone.

Specifically, the use of physical punishment has often been associated with other risk factors implicated in the development of maladaptive child outcomes. These have included child characteristics (temperament) (Calkins & Johnson, 1998; Keenan & Shaw, 2003), ineffective parenting practices (low warmth) (Denham, et al., 2000; Gilliom and Shaw, 2004; Smith, Calkins, Keane, Anastopoulos, & Shelton, 2003), and environmental factors (low SES, ethnicity) (Nagin & Tremblay, 2001; Shaw, Keenan, Vondra, Delliquadri, & Giovannelli, 1997). Therefore, the developmental psychopathology

perspective would suggest that the risk associated with physical punishment and its interactions with the reciprocal influences of the other associated multilevel risk factors may set the stage for maladaptive developmental trajectories in certain children (Luthar, 2006). Using a DP framework to conceptualize this association, the literature on physical punishment and externalizing child behavior problems suggests that an interaction between physical punishment and other risk factors, such as temperament, caregiver-child emotional climate, ethnicity, and socioeconomic status should be examined. These interactions may ultimately emerge as the factors that determine a child's vulnerability to maladaptive behavior outcomes as a result of experiencing physical punishment.

Reconciling Discrepancies

Based on the review of the literature, it is clear that there are numerous discrepancies in the findings of studies examining the role that physical punishment plays in the course of development. One explanation for such discrepancies in the findings concerning the association between physical punishment and subsequent developmental outcomes may be the differences in the methodologies used to study this association. For example, one methodological difference that has greatly contributed to such discrepancies is the numerous definitions used to operationalize the construct of physical punishment (Aucoin, Frick, & Bodin 2006). Past research has often failed to distinguish between different levels of severity and frequency, as well as how these influence each other, when measuring physical punishment. Because of this inconsistency, some studies make conclusions based on samples that include children experiencing severe or abusive

physical punishment, while others exclude this group. As would be expected, these studies present very different pictures concerning the influence of physical punishment on developmental outcomes (Larzelere & Kuhn, 2005). For instance, a study that simply inquires about the use of physical punishment without clarifying the severity and frequency may have a sample that consists of children whose experience with physical discipline ranges from never to abusive (Larzelere & Kuhn, 2005). Because research has clearly shown that overly harsh or abusive discipline is associated with more negative outcomes (Deater-Deckard, Ivy, & Petrill, 2006; Mulvaney & Mebert, 2007; Aucoin, Frick, & Bodin, 2006), results based on such a sample may find superficial associations between physical punishment and poor outcomes as a result of their failure to incorporate all important aspects of their construct in their operational definition.

Another methodological concern about the literature analyzing the relation between physical punishment and developmental outcomes is that much of this research is correlational and has been erroneously used as evidence to support causal theories and conclusions (Gershoff, 2002; Larzelere & Kuhn, 2005). As a result, there is limited understanding of the mechanisms that may influence or explain the relation between physical punishment and child outcomes. According to the developmental psychopathology framework, when answering questions about factors that cause the development of maladaptive versus adaptive developmental pathways, one must consider multiple levels of influences and outcomes (Rutter & Sroufe, 2000). Adopting an interactionist approach, such as the ecological systems model proposed by

Bronfenbrenner (1979, 1998), allows for the examination of environmental and cultural factors, parenting factors, as well as factors that are unique to the child. Because behavior can only be understood in its broader context (Masten, 2006), it is important to explore each of these levels when considering causal links between physical punishment and child outcomes. Until a more consistent definition of physical punishment is used in conjunction with careful longitudinal research design and more informative statistical techniques, researchers can only speculate about the nature of the relation between physical punishment and child outcomes.

Summary. As evidenced by decades of contradictory empirical findings, the relation between physical punishment and later social-emotional adjustment is far from straightforward and may involve the interaction of multiple factors at multiple levels of analysis. Moreover, much of the research about physical punishment and subsequent outcomes conducted thus far has been correlational and has not provided sufficient evidence to support causal theories and conclusions (Gershoff, 2002; Larzelere & Kuhn, 2005). In addition, there has been limited exploration of other factors that may interact with physical punishment to predict developmental outcomes longitudinally. These factors may include characteristics of the parent, the child, and environment. Physical punishment, and physically discipline broadly, does not occur in a vacuum. Therefore, characteristics specific to each parent and child, as well as the environment in which physical punishment occurs, may be the factors that ultimately determine whether the outcomes of physical discipline are normative or maladaptive. Evaluating these

constructs in a longitudinal manner would allow for a better understanding of the influence of these factors over time. The mixed nature of previous empirical findings calls to a need for a broader, more systematic perspective in order to fully understand the influence of physical punishment on developmental outcomes, specifically externalizing behavior problems.

Moderators of Physical Punishment and Children's Externalizing Behavior

Problems

Within a DP framework, it is essential to identify the contextual and person-centered factors that contribute to the multifinality of developmental pathways. Physical punishment alone may not be inherently negative; rather other risk factors may additively contribute to the likelihood that, for some children, physical punishment is more detrimental than effective. Factors such as temperament, caregiver-child interactions, race, and socioeconomic status may ultimately emerge as the variables that determine the range of maladaptive outcomes that may result from the experience of physical punishment.

Child temperament. When considering the potential influence of physical punishment on child outcomes, it is necessary to acknowledge that the child is at the center of these models. Multilevel theories of development have acknowledged that, not only do environmental and family systems influence the child, but that the child also influences each of these systems (e.g. Bronfenbrenner, 1979; Calkins & Fox, 2002;

Rothbart & Bates, 1998; Rutter & Sroufe, 2000). Because of this, it is necessary to explore characteristics specific to the child, such as temperament, that may increase the understanding of the differential outcomes associated with physical punishment.

Temperament has been defined as, “biologically rooted individual differences in behavior tendencies that are present early in life and are relatively stable across various kinds of situations and over the course of time,” (Bates, 1987, p. 1101) as well as, constitutionally based individual differences in reactivity and self regulation” (Rothbart and Bates, 1998). Temperament has been viewed both dimensionally and categorically, identifying a continuum of emotionality on which children fall or “types” of children based on behavioral and emotional profiles. The stability of emotionality and temperamental profiles has been supported by studies examining the prediction of later temperament style from emotionality observed in infancy (Izard et al., 2000).

Many theorists have developed models for the structure of child temperament, starting with Thomas and Chess (1977), who identified nine temperamental categories, including activity level, rhythmicity, approach or withdrawal, adaptability, threshold of responsiveness, intensity of reaction, quality of mood, distractibility, and attention span or persistence. These authors noted that combinations of these temperamental categories yielded three fundamental temperament types: “easy”, “difficult”, and “slow-to-warm-up.” Three dimensions of temperament were later described in the Emotionality-Activity-Sociability model (EAS). “Emotionality” referred to a proneness to experience anger sadness and fear; “Activity” described characteristics such as vigor and endurance; and

“Sociability” referred to traits such as affiliation and responsiveness to other people. Each of these temperamental profiles have different implications for child development. Inherent in definitions of temperament is the presumption that these biologically based reactions play a part not only in emotional development, but also in the development of related capacities, such as behavioral control. Specifically, child negativity—also referred to as difficult temperament— is consistently implicated in pathways to poor developmental outcomes and in the development of childhood pathology (Egger & Angold, 2006). Child negativity has been found to have direct effects on externalizing problem behaviors (e.g., Eisenberg et al., 2001). Negativity has been shown to play a large role in the development of externalizing behavior patterns despite the presence of positive affectivity (Izard et al., 2000).

As discussed above, an important component of temperament that has been implicated in the multifinality of child outcomes is a child’s ability to regulate their negative affect. Research has suggested that the expression and strength of temperamental traits are rooted in neurobiological substrates (Brenner, Beauchaine, & Sylvers 2005), which provides important insight into an individual's ability to regulate their emotions. Porges' polyvagal theory (Porges, Doussard-Roosevelt & Maita, 1994; Porges, 1996) describes how neural regulation of the autonomic nervous system (ANS) regulates homeostatic functioning, which is in turn involved in the regulation of behavior. Given the underlying biological basis of the ability to determine adaptive responses to environmental demands, how well a child regulates their physiological responses over

time may have implications for long term behavioral outcomes.

Children with difficult temperamental dispositions have been found to have significantly increased baseline respiratory sinus arrhythmia (RSA) and decreased RSA suppression in stressful situations, which was associated with physiological dysregulation and subsequent developmental difficulties (Burgess, Marshall, Rubin, & Fox, 2003; Shannon, Beauchaine, Brenner, Neuhaus, & Gatzke-Kopp, 2007). Empirical evidence for this argument was found in a study that examined the role of temperamental influences in child behavior problems. Researchers found that children who were rated by parents and trained observers as having a more difficult temperament in infancy exhibited a limited ability to regulate negative emotions in preschool when compared to children classified as having an easy temperament (Burgess et al., 2003).

Children characterized as temperamentally difficult are at a greater risk for behavior problems in general, and it stands to reason that children who require more corrective interventions, such as physical punishment, may exhibit more maladaptive behavior when compared to those not needing interventions (Gallagher, 2002). More specifically, Keenan and Shaw (2003) found that children who had an underdeveloped ability to regulate their emotions, or a difficult temperament, also had more maladaptive developmental outcomes than children who were able to effectively regulate their emotional responses during stressful or difficult situations, such as a discipline experience. In addition, research has shown that children who have been identified by both teachers and parents as temperamentally difficult have a higher risk for negative

outcomes associated with physical punishment (Nicholson, Fox, & Johnson, 2005).

Given that children with difficult temperaments have been found to be less capable of regulating their responses to contextual cues on a biological level, these innate influences may help explain why some children react differently to physical punishment. Temperamentally difficult children may be less responsive to discipline cues, and as a result, may be unable to correctly adjust their behavior despite continued punishment experiences (Dadds & Salmon, 2003; Knafo & Plomin, 2006; Shannon et al., 2007). Specifically, this may influence how children respond to physical punishment. For example, children with more negative temperamental dispositions may only encode the aggressive nature of physical punishment instead of the intended corrective discipline messages (Nas, De Castro, & Koops, 2005). This could be particularly problematic for temperamentally difficult children who experience physical punishment because previous studies have shown that difficult children were more likely to make hostile attributions and experience less guilt for negative behaviors (Nas et al., 2005). Therefore, if a difficult child is biologically prone to attributing hostility to other's actions, the underlying corrective intent of physical punishment may be overlooked and the unwanted behavior exacerbated by the aggressive nature of physical punishment. As a result, temperamentally difficult children may be more likely to respond to physical punishment in maladaptive ways, such as an unintended increase in persistent externalizing behavior problems because the physiological arousal caused by the experience of physical punishment heightened their biological predisposition for dysregulation (Kerr, Lopez,

Olson, & Sameroff, 2004).

Based on evidence in the literature, it appears that the very children who behave in ways that elicit frequent discipline, specifically physical punishment, may be the children who have the most detrimental outcomes as a result of these punishment experiences (Keenan and Shaw, 2003; Kerr, Lopez, Olson, & Sameroff, 2004; Nicholson, Fox, & Johnson, 2005). Research has shown that the natural tendency of difficult children toward maladaptive outcomes seems to be exacerbated by the experience of physical punishment (e.g. Burgess, et al., 2003; Ingoldsby et al., 2006; Shannon, et al., 2007). These findings have been shown to remain significant even when other child factors were taken into account, suggesting that a child's temperamental style may be an important factor that influences the association between physical punishment and a child's vulnerability to maladaptive developmental outcomes (Dadds & Salmon, 2003; Lau, Litrownik, Newton, Black, & Everson, 2006; Shannon et al., 2007). Overall, these findings suggest that children with more difficult temperaments react in ways that predispose them to negative outcomes, but they may also respond negatively to interventions aimed at preventing such poor trajectories. Given the reciprocal influence of child temperament on contextual variables; however, it is necessary to consider not only how a child reacts to the environment, but also how the environment in turn reacts to the child.

Emotional climate. The emotional climate that characterizes parent-child interactions may interact with physical punishment to determine whether children

experience maladaptive or normative outcomes. An aspect of the home environment that directly influences emotional climate is parenting behavior. Specifically, the warmth or positivity that a parent engages in fosters a healthy emotional climate, which in turn may buffer against the potential negative influence of physical punishment (Baumrind, Larzelere, & Owens, 2010). Literature examining the way in which the parent-child relationship influences child outcomes has focused on two main dimensions of parenting including parental control, or limit setting, and parental warmth (Javo, Ronning, Heyerdahl, & Rudmin, 2004). These dimensions were further developed into three classifications of parenting by Baumrind (1971). An authoritarian style was characterized by parents who were high on the control dimension but low on the warmth dimension. Authoritative parenting described a style in which caregiver were high on both control and warmth dimensions. Finally, a permissive model included parents who were low on the dimension of control, but high in warmth toward the child. The emotional climate in which a child experiences physical punishment can be determined by the balance of parental control and warmth. In addition to the child's temperament, this balance may play a key role in understanding why some children who experience physical punishment are resilient and develop normatively, while others do not (Bao, Fern, & Sheng, 2007; Ehrensaft et al., 2003; Rodriguez, 2003). This framework provides a model for examining the influence of parenting characteristics on developmental outcomes associated with physical punishment by allowing researchers to operationally define and classify these characteristics and behaviors as social cues that fall on a

continuum of risk and protective factors.

Baumrind's (1971) classification system provided a way to conceptualize how each style of parenting and the quality of parent-child interactions associated with these styles contribute differently to adaptive and maladaptive outcomes associated with physical punishment. For example, when caregivers used physical punishment as a means of asserting power and control without providing warmth and support, as in an authoritarian parenting style, these parental behaviors were associated with an unsympathetic parent-child relationship (Shaw, Criss, Schonberg, & Beck, 2004). Similarly, a permissive style does not provide predictable boundaries and limitations, so the experience of physical punishment may not be interpreted by the child as being associated with an unwanted behavior itself. Other factors such as parenting stress and frustration may drive the caregiver's punishment actions creating a dynamic where punishment is inconsistent and unpredictable. If parental reactions to unwanted behaviors are inconsistent, misinterpretation of the discipline message is more likely, thus resulting in more maladaptive outcomes (Rubin, Burgess, Dwyer, & Hastings, 2003). Authoritative parenting, on the other hand, provides a balance between parental control and warmth, which was generally the best predictor of adaptive outcomes (Baumrind, 1971). Based on these descriptors of parenting styles, the main difference is the amount of parental warmth shown to the child. Variability in parental warmth determines the quality of the emotional interaction within the caregiver-child relationship, which can be referred to as the emotional climate of the relationship. For example, when parents

express more warmth towards their children the emotional climate created is more positive and supportive, whereas a lack of warmth creates a less positive and supportive climate. It may be this variation in parental warmth that determines the way that a child interprets discipline messages associated with the experience of physical punishment. This balance may play a key role in understanding why some children who experience physical punishment develop normatively, while others do not (Bao, Fern, & Sheng, 2007; Ehrensaft et al., 2003; Rodriguez, 2003).

To fully understand the variety of developmental outcomes associated with the experience of physical punishment, one must consider how the reciprocity between the child and the caregiving context influences psychological risk. One theoretical approach that had provided a framework for studying this interplay among different influences is social information processing theory (SIP). SIP postulated that children's adjustment is determined by how well they were able to process various cues within their environment (Crick & Dodge, 1994). The model also suggested that a child's behavior in a specific situation occurs as a function of the way in which a child processes social cues in that situation. This process was described in terms of five major units of interaction that were assumed to occur in real time and are necessary for well adjusted outcomes.

During the first step of this process the child encodes social cues, such as physical punishment, from the environment (Dodge et al., 1986). This encoding may be accurate or inaccurate depending on the child's attention to and perception of the cues. After encoding has taken place, the child must mentally represent the cues in order to interpret

them in an accurate and meaningful way. According to Dodge et al. (1986), this step required the utilization of interpretation rules. These rules may be simplistic or complex and may have components that were specific to the individual child, the family, or the culture. Consequently, this may be the step in the process that allows for differential responses to physical punishment. For example, if a child had a mental interpretation rule that all physical aggression was negative or mean, such as with children who had a negative temperament, then they would be more likely to misinterpret the cue of physical punishment. Steps three through five in this model (Dodge et al., 1986) encompass the child's generation of potential behavioral responses, consideration of consequences, and action of a chosen behavior. Once again, a child who interpreted physical punishment inaccurately in step two may respond more negatively by withdrawing or acting out. Therefore, the overall emotional climate in which a child experienced physical punishment may have determined how a child interpreted the caregivers' intended socialization cues and thus, the child's subsequent behavior.

Some empirical evidence has shown that children with difficult versus easy temperamental styles were more susceptible to maladaptive outcomes associated with physical punishment specifically when it was experienced within a caregiver-child emotional climate that is characterized by low parental warmth (Bates, Pettit, Dodge, & Ridge, 1998; Gallagher, 2002; Leve, 2005). One could infer that because difficult children make parenting very strenuous and challenging, negative interaction patterns between them and their caregivers could result (Ingoldsby et al., 2006). For example,

when a child with a negative predisposition continually challenges the caregivers' rules, this may tax the caregiver's ability to respond in a warm manner, resulting in harsh or inconsistent responding. As previously noted, temperamentally difficult children often have a natural tendency towards maladaptive outcomes, so this pattern of interaction could create an emotional climate between caregiver-child that is low in warmth and positivity (Knafo & Plomin, 2006). In other words, because temperamentally difficult children are more likely to behave in ways that elicit more frequent discipline, there may be a greater likelihood that a negative or less positive emotional climate would emerge. These findings reflected the importance of examining the influence of multiple factors on the association between physical punishment and externalizing behavior problems. The family's emotional climate may be an important contextual determinant of the persistence of externalizing behavior problems when physical punishment is used. Further, these findings suggested that the level of parental warmth/positivity in the caregiver-child relationship interacted with the type of punishment used in the determination of the adaptability of child outcomes. This was likely because children's caregivers are the most prominent source of socialization for children (Johnson et al., 2006).

Research has clearly shown that characteristics specific to the caregiver-child relationship, and the emotional climate created by these characteristics, can influence how a child responds to the experience of physical punishment (Denham et al., 2000; Gilliom and Shaw, 2004; Smith et al., 2004). When children and caregivers are involved in relationships with little warmth, negative outcomes may be exacerbated. However,

many children who have experienced these risk factors in conjunction with physical punishment do not have maladaptive developmental patterns. Although understanding child and caregiver influences that represent risks for negative outcomes is important, it is necessary to consider influences at the contextual level to fully understand this association.

Contextual factors. Previous research has shown that the environment in which a child lives is influential in the course of a child's development and subsequent outcomes (Bronfenbrenner & Morris, 1998; Masten, 2006; Rutter, 1989). The influence of environmental factors (i.e. ethnicity, socioeconomic status) is transactional, and impacts development by interacting with other systems that are more proximal to the child. As a result, contextual differences also represent possible risk factors that could help explain the multifinal outcomes of children whose parents utilize physical punishment as a discipline technique. Research has shown that children are influenced by the culture and society in which they live through various mechanisms including communication with parents and others within the community, cultural beliefs, and the availability of community and family resources. Contextual factors that have been shown to influence the way children react to the experience of physical punishment specifically have included race and socioeconomic status (Bronfenbrenner & Morris, 1998; Masten, 2006; Rutter, 1989).

Race. The cultural context in which a child experiences physical punishment has been shown to influence how the child perceives and reacts to that experience

(Bronfenbrenner, 1979). Past research indicated that the some ethnic groups were more accepting of the use of physical punishment as a form of punishment (Amato & Fowler, 2002; Javo, Ronning, Heyerdahl, & Rudmin, 2004; Lau, Litrownik, Newton, Black, & Everson, 2006). Subsequently, it has been shown that within ethnic groups that historically accept the use of physical punishment as traditional (e.g. African American), children have fewer maladaptive outcomes when compared to children from other ethnic groups that are less accepting of this discipline technique (Grogan-Kaylor & Otis, 2007; Lansford et al., 2005; Smith, Springer, & Barrett, 2010).

These findings challenge many prevailing theories used to explain the differential outcomes associated with physical punishment. For example, social learning theory (Bandura, 1977) suggested that humans learn through observations of others' behavior. This theory postulated that children learn behaviors by observing and mimicking others' behavior. Specifically, if children observe positive, appropriate behaviors and outcomes, they are more likely to model and adopt appropriate behavior themselves and vice versa, regardless of context. Related to physical punishment, social learning theory implies that parental punishment style directly affects children the same way in all circumstances (Maccoby & Martin, 1983). Therefore, the use of physical punishment would teach children that the use of aggression was acceptable regardless of the context. This however, is not always the case given the mixed nature of findings from studies examining physical punishment and subsequent developmental outcomes in different cultures.

One explanation for differences in developmental outcomes resulting from the experience of physical punishment between ethnic groups was derived from the idea that outcomes vary according to the level of cultural acceptance (Amato & Fowler, 2002; Grogan-Kaylor & Otis, 2007; Lansford et al., 2005). As previously discussed, children are indirectly influenced by the culture and society in which they live through various mechanisms (Bronfenbrenner, 1979). The overall cultural context serves as an indicator to a child about what is normative and acceptable within any given environment (Bronfenbrenner, 1979; Molnar, Buka, Brennan, Holton, & Earls, 2003). Thus, cultural differences may contribute to differences in interpretation and acceptance of the discipline messages sent by the use of physical punishment within a given context. The level of cultural acceptance by particular ethnic groups may then contribute to the variability in developmental outcomes associated with the experience of physical punishment (Dodge, 1986; Smith, Springer, & Barrett, 2010). When children perceived physical punishment as negative and controlling, outcomes were more maladaptive in nature (Lansford et al., 2005). Alternatively, when children perceived physical punishment as a normative form of discipline intended to shape behavior, they were less likely to react negatively because of the cultural understanding that the punishment was related to the inappropriate behavior and not their self-worth or the quality of the caregiver-child relationship. These findings suggested that the effects of parental discipline techniques may not be direct or universal (Dodge, 1986; Lansford et al., 2005; Smith, Springer, & Barrett, 2010).

When cultural messages about discipline and the discipline technique experienced coincide, the way a child interprets the discipline experience may also coincide with these values and increase the chance of independent adaptive behavior regulation (Grogan-Kaylor & Otis, 2007). For example, if a child interprets the experience of physical punishment as the norm, that child may be less likely to interpret the punishment as negative or controlling. Conversely, if cultural norms determined by ethnicity dictate that all physical discipline is inappropriate, the likelihood that it would be interpreted negatively and increase maladaptive behavior may be increased. As Dodge (1986) hypothesized, an accurate interpretation of social cues, such as those provided through punishment, is imperative for adaptive behavioral responses and subsequent outcomes, and it is hypothesized that cultural norms play a role in determining how encoded social cues are perceived. For example, even if the child's temperamental style is more difficult and the child requires more discipline, or may tax the parent, if the child understands that this form of punishment is acceptable within the broader cultural context, they may be better able to learn from the experience of physical punishment.

Socioeconomic Status. Cultural acceptance based on ethnicity is not the only aspect of the child's environment that may influence how they respond to the use of physical punishment. Structural characteristics of one's environment are also found to play an influential role in the well-being of children. Adopting an interactionist approach, such as the ecological systems model proposed by Bronfenbrenner (1979, 1998), allows researchers to examine the influence of environmental factors and how it

impacts development by interacting with other systems that are more proximal to the child. SES may influence the association between physical punishment and behavioral outcomes indirectly through increased demands and stressors placed on families in the lower socioeconomic status. For example, there may be limited opportunities for warm and positive caregiver-child interactions in low-income families. This could result from several factors including single-parenting, poor quality child care, or less time together due to maternal factors, such as depression and long work schedules, all of which are related to low SES (Borman & Overman, 2004). For example, low income was related to maternal insensitivity, which directly affected the quality of the caregiver-child relationship (Bakermans-Kranenburg, van IJzendoorn, & Kroonenberg, 2004). The quality of this relationship may be particularly important for children who experience physical punishment in lower SES families (Borman & Overman, 2004; Petrill & Deater-Deckard, 2004).

In terms of environments characterized by fewer financial resources, research has shown that children living in poorer families and less stable communities have generally been found to have more maladaptive adjustment outcomes than children from more affluent and stable communities that experience regardless of the experience of physical punishment (Ingoldsby, Shaw, Winslow, Schonberg, Gilliom, & Criss, 2006; Lau, Litrownik, Newton, Black, & Everson, 2006). However, research has also shown that when children in contexts characterized by economic decline experience physical punishment, their developmental outcomes are more maladaptive than children who

experience physical punishment in more affluence contexts. Specifically, Ingoldsby et al. (2006) reported that the more financially unstable a child's environment, the more likely physical punishment would lead to antisocial behavior. It was also reported that the children who continued displaying maladaptive developmental outcomes into later childhood typically lived in extremely impoverished and unstable environments when compared to children with better outcomes.

This research suggests that the negative effects associated with environmental disadvantage may be exacerbated by the experience of physical punishment, further increasing the likelihood of overall negative child outcomes. In contrast, children who experience physical punishment in a more stable social environment may be more resilient against the possible negative effects of physical punishment because they are protected from the other risk factors associated with living in an environment characterized by economic decline. These characteristics of the child's environment may indirectly influence outcomes associated with the experience of physical punishment in several ways. It has been argued that structural (e.g., community resources and neighborhood composition) and social (e.g., deviant peers, gangs, and perceptions of danger) characteristics of a child's contextual environment play indirect roles in their developmental outcomes (Seidman, 1998). Specifically, contexts characterized by economic decline, decreased family resources, and overall instability presented increased risk for negative outcomes as a result of a lowered sense of community (Ingoldsby, Shaw, Winslow, Schonberg, Gilliom, & Criss, 2006). This is particularly important when

considering the effects of physical punishment on child outcomes because children in these environments are consistently exposed to delinquent subcultures that reinforce negative behavior (Ingoldsby et al., 2006). As children age, the influence of the social environment within the community may become more powerful than the discipline messages that children receive at home. This may contribute to the misperception that physical punishment delivered by the parents is an attempt to forcefully control the child's behavior. This type of interaction between caregiver, child, and overall context constitutes a risk factor for maladaptive outcomes by possibly creating an environment that could lend itself to hostile and ineffective punishment (Dishion & Patterson, 2006; Roisman, Aguilar, & Egeland, 2004; Shaw, Gilliom, Ingoldsby, & Nagin, 2003).

In sum, when children experience discipline techniques that are widely accepted as normative in any given environment, the consequences of that experience may also be more normative. Similarly, the experience of physical punishment within a stable and nurturing environment may also lead to more normative outcomes because boundaries are clearly defined and punishment is predictable. This research provides an idea about the environmental conditions that may present certain risk and protective factors associated with various child outcomes. Some factors such as economic disadvantage and unstable environments may independently contribute to poor outcomes; the accumulation of such risks may be a stronger predictor of maladaptive outcomes. Although physical punishment may not negatively affect all children, when children experience physical punishment in an environment where there is an accumulation of risk factors, they may

be at a greater risk for maladaptive outcomes. These environmental factors alone, however, cannot fully explain why some children in similar environments respond so differently to physical punishment.

It is clear that there are many pathways to and explanations for the variety of outcomes within the behavioral domains that are associated with the experience of physical punishment. This review has focused on factors, both contextual and inherent to the child, that may provide insight into normative developmental outcomes as well as maladaptive developmental outcomes that result from this experience. These factors included the child's temperament (difficult/negatively reactive/poor adaptation versus easy/positively reactive/adapts easily), caregiver-child relationship characteristics (emotional climate), and the overall environmental risk (ethnicity and socioeconomic status).

Gender. Research has consistently shown that boys are more sensitive to negative disruptions in the parent-child relationship (Van Ijzendoorn et al., 2000), putting them at greater overall risk for maladaptive outcomes. More specifically, gender differences have been shown to contribute to differential effects of parent-child interactions, including punishment interactions. One of the gender differences that may be particularly important for developing a better understanding of children's response to physical punishment are the differences in boys' and girls' responses to distressing or challenging situations. For example, Briggs et al. (2001) report that girls are more compliant to verbal commands at an earlier age than boys and seek comfort when

distressed. Boys, on the other hand, are less likely to comply with maternal request and instead respond to distress by distracting themselves. Many times these distraction techniques include inappropriate and disruptive behaviors, such as hyperactivity, anger, and aggression (Keenan & Shaw, 2003). Recent literature suggests that these gender differences continue into late childhood and adolescence and are exacerbated by the experience of physical punishment. Specifically, when controlling for frequency of physical punishment, male adolescents reported significantly higher levels of externalizing behavior problems than girls (Smith, Springer, & Barrett, 2011).

Examining these differences from a developmental perspective gives rise to the theory that there is a biological explanation for these gender differences. These differences may be a result of the child's ability to accurately interpret social cues, such as physical punishment, in order to monitor behavior. Research has shown that boys typically develop higher order cognitive skills, such as social perspective taking, more slowly than girls (Bennet et al., 2007; Espy & Kaufmann, 2002; Zelazo, Muller, Frye, & Marcovitch, 2003). The development of social perspective taking skills has also been shown to influence the how a parent delivers and a child responds to physical punishment (Goodman, Fleitlich-Bilyk, Patel, & Goodman, 2007; Huesmann, Eron, & Dubow, 2002; Mulvaney & Menert, 2007). As evidence has shown, girls show earlier maturation in cognitive functioning, which may be associated with more accurate interpretations of punishment experiences. Therefore girls are able to understand social and behavioral norms earlier than boys and become more concerned with how their behavior influences

others (Kerr, Lopez, Olson, & Sameroff, 2004; Messer, Goodman, Rowe, Meltzer, & Maughan, 2006). Subsequently, earlier cognitive maturation may lead to fewer behaviors that require correction through the use of physical punishment at earlier ages for girls. The possibility that risks posed by physical punishment experiences are cumulative, as well as the increased likelihood that a child with less well developed cognitive skills will misinterpret the discipline message, creates a situation in which boys have a disadvantage. For example, if boys continue to behave in ways that illicit physical punishment into later childhood and adolescence but do not have an accurate perception of why they are experiencing physical punishment, the result would be more maladaptive behavioral outcomes (Bender et al., 2007; Thornberry, Ireland, & Smith, 2001).

Based on these biological differences between boys and girls, cultural norms and gender stereotypes have emerged that also greatly influence how the different genders experience and react to physical punishment. For example, because boys are less likely to understand, accept, and adjust their behavior to align with societal norms as quickly as girls, they typically experience harsher physical punishment more frequently (Cote & Azar, 1997; Sorbring, Rodholm-Funnemark, & Palmerus, 2003). Similarly, Keenan & Shaw (2003) found that parents of boys use more hostile and aggressive language when implementing physical discipline. This type of parent-child interaction may facilitate more negative interpretations of physical punishment and increase behavior problems, thus creating a self-fulfilling cycle for boys. Additionally, because boys are more susceptible to negative environmental disruptions, they may be more reactive to any type

of discipline implemented by caregivers (Ehrensaft et al., 2003). Overall, the research indicates that a child's gender may greatly influence reactions to physical punishment, with boys being at greater risk for maladaptive outcomes. Therefore the current study examined the role of physical punishment and moderating factors on externalizing behavior problems separately for males and females.

CHAPTER III

AIMS AND HYPOTHESES

The goal of this longitudinal study was to examine the influence of physical punishment on patterns of change in externalizing behavior problems across the late childhood period in a community sample of children who differ in terms of child temperament, the emotional climate of the parent-child relationship, and contextual risk. Given that research has indicated that there are more risk factors associated with being male than female, the current study assessed these associations separately for boys and girls (Kerr, Lopez, Olson, & Sameroff, 2004).

Aim 1: Assess General Patterns of Externalizing Symptoms in Later Childhood. The first goal of the current study was to examine the general patterns of change in externalizing symptoms for males and females from ages 5 to 10 and to assess whether there was significant variance in the parameters (i.e. intercept and slope) as a way of extending prior work noting the general decline in externalizing behavior problems over time (Campbell, 2002).

Hypothesis 1: Typically, children's early development includes a moderate level of disruptive behavior which normatively decreases between ages two and five as children learn more regulatory skills and can better cope with developmental challenges (Campbell, 2002; Loeber & Hay, 1997; Owens & Shaw, 2003). Therefore, it was

hypothesized that there would be a normative overall decline in externalizing symptoms from ages 5 to 10 for both males and females. However, research has shown that this is not the case for all children. For a subset of children, externalizing behaviors in early and middle childhood have been found to be predictive over time and show moderate stability into later childhood (Owens & Shaw, 2003). During the early and middle childhood periods, children are challenged with normative developmental tasks, such as language, cognitive development, and emotion regulation. If these tasks are delayed by persisting externalizing behaviors, the literature has shown that these children often continue to have adjustment difficulties later in childhood (Coie, Lochman, Terry, & Hyman, 1992). Given these findings, it was also predicted that there would be significant variation in the trajectories of externalizing behavior problems between children for both males and females.

Aim 2: Assess Relations between Physical Punishment and Externalizing Symptoms. Given that much of the research concerning the association between physical punishment and externalizing behavior problems conducted thus far has been correlational and does not provide sufficient evidence to support causal theories and conclusions (Gershoff, 2002; Larzelere & Kuhn, 2005), the second aim of this study was to explore the longitudinal association of these constructs by examining the main effect of physical punishment on the trajectory of externalizing behaviors from ages 5 to 10 for both males and females.

Hypothesis 2. Previous work has indicated that global aspects of parental

discipline techniques and general styles of child behavior are related (Dumas & LaFreniere, 1993). Specifically, the strategies caregivers use to manage unwanted behavior have been found to be predictive of various social-emotional outcomes such as increased externalizing behavior problems and poorer school adjustment (Denham et al., 2000; Eisenberg, Cumberland, & Spinrad, 1998). Gender differences have also been shown to contribute to differential effects of parent-child interactions, including punishment interactions. One of the gender differences that may be particularly important for developing a better understanding of children's response to physical punishment are the differences in boys' and girls' responses to distressing situations, such as the experience of physical punishment. Specifically, when controlling for frequency of physical punishment, male adolescents reported significantly higher levels of externalizing behavior problems than girls (Smith, Springer, & Barrett, 2011). Therefore, it was hypothesized that higher levels of physical punishment would predict a slower rate of decline in externalizing behavior over time and higher levels of externalizing behaviors at age 10 for both males and females. However, the experience of physical punishment was hypothesized to be more negative for boys. In other words, children who experienced more physical punishment were expected to have more persistent externalizing behavior problems into later childhood.

Aim 3: Assess Moderators of the Association between Physical Punishment and Externalizing Symptoms. Despite some empirical evidence that has directly linked physical punishment with negative outcomes, there is also evidence that physical

punishment is associated with normative outcomes (see Larzelere & Kuhn, 2005 for reviews). The mixed nature of these findings indicate that the association between physical punishment and later socio-emotional adjustment is far from straightforward and may involve the interaction of multiple factors. Therefore, the third aim of this study was to examine four systems factors (child temperament, parent-child emotional climate, race, and SES) as moderators of the association between physical punishment and externalizing behavior problems for both males and females.

Hypothesis 3a. Based on previous findings reported in the literature, children with difficult temperaments are biologically vulnerable to maladaptive socio-emotional outcomes even in the absence of other known risk factors (Keenan and Shaw, 2003; Kerr, Lopez, Olson, & Sameroff, 2004; Nicholson, Fox, & Johnson, 2005). Research has shown that the natural tendency of difficult children toward maladaptation is exacerbated by the experience of physical punishment (e.g. Ingoldsby et al., 2006; Knafo & Plomin, 2006; Nicholson, Fox, & Johnson, 2005; Shannon, et al., 2007). In other words, the very children who tend to elicit punishment interactions are the children who may be most vulnerable to negative outcomes associated with physical punishment. Therefore, it was hypothesized that children, regardless of gender, who have difficult temperaments and who experience physical punishment will have higher initial levels of externalizing behavior problems at age five, as well as a slower decline in externalizing behavior problems over time, whereas children who have a less difficult temperament will have lower initial externalizing behavior problems at age 5 and will have a more normative

decline in behavior problems regardless of experiencing physical punishment.

Hypothesis 3b. Although there has been limited research examining causal links between the emotional climate of the parent-child relationship and child externalizing outcomes, many studies have shown a correlation between the emotional climate in which a child experiences physical punishment and subsequent outcomes (Bao, Fern, & Sheng, 2007; Ingoldsby et al., 2006; Javo, Ronning, Heyerdahl, & Rudmin, 2004). These findings suggested that the level of parental warmth/positivity in the caregiver-child relationship may serve as a protective factor by interacting with the type of punishment in the determination of the adaptability of child outcomes. Subsequently, it was hypothesized that children who experience physical punishment in an emotional climate characterized by parental positivity will have lower levels of externalizing behavior problems at age 5 and more normative decline in externalizing behavior problems, whereas children who experience physical punishment in less positive emotional climate will have higher externalizing behavior problems initially and will have a slower decline over time. Research has consistently shown that boys are more sensitive to negative disruptions in the parent-child relationship (Van Ijzendoorn et al., 2000), putting them at greater overall risk for maladaptive outcomes. This is particularly important when considering physical punishment experiences due to the negative connotation of this experience. For example, because boys are less likely to understand, accept, and adjust their behavior to align with societal norms as quickly as girls, they typically experience

harsher physical punishment more frequently (Cote & Azar, 1997; Sorbring, Rodholm-Funnemark, & Palmerus, 2003). Therefore, it was hypothesized that this interaction effect would be more pronounced for males than for females.

Hypothesis 3c. One specific environmental factor that has been shown to influence the way children react to the experience of physical punishment is the level of cultural acceptance (Bronfenbrenner & Morris, 1998; Masten, 2006; Rutter, 1989). Research has shown that within cultures that historically accept the use of physical punishment as traditional, such as in the African American culture, children have fewer maladaptive outcomes when compared to children from other cultures (Amato & Fowler, 2002; Grogan-Kaylor & Otis, 2007; Lansford et al., 2005). Based on previous work, it was hypothesized that children who identify as African American who experience physical punishment would have lower levels of externalizing behavior problems initially and more normative declines in externalizing behaviors over time because of the normative nature of the discipline technique. Conversely, it was expected that Caucasian children who experienced of physical punishment would have higher initial levels of externalizing behavior problems as well as a slower decline over time. This association was expected to be true for both males and females.

Hypothesis 3d. It has also been argued that structural characteristics of one's environment play indirect roles in the well-being of children (Seidman, 1998). Specifically, children from environments characterized by economic decline, decreased family resources, and overall financial instability had a present increased risk for negative

overall outcomes (Ingoldsby et al., 2006). In terms of outcomes specifically associated with the experience of physical punishment in environments characterized by fewer financial resources, research has shown that children living in poorer families and less stable communities have generally been found to have more maladaptive adjustment outcomes than children from more affluent and stable communities that experience physical punishment (Ingoldsby et al., 2006; Lau, Litrownik, Newton, Black, & Everson, 2006). Therefore, it was hypothesized that children from lower SES who experienced physical punishment would have a slower decline in externalizing symptoms than children from more affluent families who experienced physical punishment because their overall level of risk would be higher. A similar pattern was expected to be found for both males and females.

Hypothesis 3e. Multilevel theories of development have acknowledged that, not only do environmental and family systems influence the child, but that the child also influences each of these systems in a reciprocal manner (Bronfenbrenner, 1979; Calkins & Fox, 2002; Chess & Thomas, 1989; Eisenberg, Cumberland, & Spinrad, 1998; Maccoby & Martin, 1983; Rothbart & Bates, 1998; Rutter & Sroufe, 2000). Because of the reciprocal nature of caregiver-child relationships, the interaction between physical punishment, negative affect, and emotional climate was also hypothesized to influence externalizing behavior problem trajectories. Specifically, it was hypothesized that children who had less difficult temperament and a more positive emotional climate would continue to exhibit more adaptive outcomes in spite of the experience of physical

punishment. Children with more difficult temperamental styles and a less positive emotional climate, however, were expected to show less normative declines in externalizing behavior problems with the experience of physical punishment.

CHAPTER IV

METHODS

Participants

This project included a subset of data collected during a longitudinal study conducted in a small southeastern city in the United States. Participants included 447 children from three different cohorts as part of the larger ongoing longitudinal study that began when children were two-years-old and followed them through ten years of age. Participants were initially recruited at two-years of age through child day care centers, the County Health Department, the local Women, Infants, and Children program, and from a second longitudinal study that began when the children were six-months of age. In order to obtain a broad, community-based sample of children with a wide range of disruptive behavior, potential participants were screened on the Child Behavior Checklist (CBCL 2-3; Achenbach, Edelbrock, & Howell, 1987).

For Cohort 1, 474 children were screened. Sixty-five percent of these families were European American, 30% were African American, and 5% were Asian or Hispanic. Hollingshead (1975) scores classified 61% of the families as middle class, twenty-five as lower class, and fourteen percent as upper class. From this larger sample, 154 children were selected based on their CBCL scores. Forty-four of these children had externalizing scores on the CBCL in the clinical or borderline clinical range (t-scores of 60 or above),

twenty-seven of the children had both externalizing and internalizing scores above the clinical or borderline clinical range, and 83 of the children scored below the clinical or borderline clinical range on both externalizing and internalizing subscales. The final sample of children in Cohort 1 was racially and economically diverse (65% European American; mean Hollingshead score = 39.2), primarily from intact families (77%), and 78 were male and 76 were female.

For Cohort 2, 492 children were screened. Seventy-three percent of these families were European American, twenty-four percent were African American, and three percent were biracial. Seventy-three percent of the families were classified as middle class, fifteen percent as lower class, and twelve percent as upper class. From this larger sample, 153 children were selected. Forty-eight of the children had externalizing scores on the CBCL in the clinical or borderline clinical range (t-scores of 60 or above), twenty-four of the children had both externalizing and internalizing score above the clinical or borderline clinical range, and eighty-one of the children scored below the clinical or borderline clinical range for both internalizing and externalizing subscales. The final sample of children selected for this cohort was racially and economically diverse (68% European American; mean Hollingshead score = 39.7), primarily from intact families (84%), and 71 were male and 82 were female.

Children for Cohort 3 came from an already ongoing longitudinal study which began when the children were six-months-old. At six-months of age, 346 infants were screened for their level of frustration based on parent responses to a subscale of a

temperament questionnaire (Distress to Limits; Infant Behavior Questionnaire [IBQ], Rothbart, 1981) and infant responses during two frustration-eliciting laboratory tasks (Barrier Task and Arm Restraint; LAB-TAB, Goldsmith & Rothbart, 1993). 162 infants were selected based on their parent's ratings on the IBQ and the laboratory assessment (Calkins, et al, 2002). Of the selected sample, eighty-five infants scored at or above the 50th percentile on both the laboratory index of frustration and maternal report of distress to limits (easily frustrated group) and 77 scored below the 50th percentile on both the laboratory index and maternal report of distress to limits (less frustrated group). This six-month old selected sample was racially and economically diverse (80% European American; mean Hollingshead score = 35.7), primarily from intact families (79%), and 79 were male and 83 were female. This sample was followed from six-months of age through infancy and toddler period and children whose mothers completed the CBCL at 2 years of age were included in the current study ($N = 140$). Based on the criteria described earlier, 21 children from this cohort were placed in the externalizing risk group. Cohort 3 had a significantly lower average 2-year externalizing T score ($M = 50.36$) compared to Cohorts 1 and 2 ($M = 54.49$; $t(445) = -4.32, p = .00$). Of the entire sample ($N = 447$), 164 children met criteria for the externalizing risk group.

Of the 447 original screened participants, 6 were dropped because they did not participate in any 2 year data collection. At 5 years of age, 399 families participated. Families lost to attrition included those who could not be located, who moved out of the area, who declined participation, and who did not respond to phone and letter requests to

participate. There were no significant differences between families who did and did not participate in terms of gender, $\chi^2(1, N = 447) = 3.27, p = .07$, race, $\chi^2(1, N = 447) = .70, p = .40$, 2-year SES, $t(424) = .81, p = .42$, or 2-year externalizing T-score, $t(445) = -.36, p = .72$. At 7-years of age 350 families participated including 19 that did not participate in the 5-year assessment. Again, there were no significant differences between families who did and did not participate in terms of gender, $\chi^2(1, N = 447) = 2.12, p = .15$, race, $\chi^2(3, N = 447) = .60, p = .90$, 2-year socioeconomic status, $t(445) = 1.46, p = .15$ and 2-year externalizing T-score ($t(445) = -.47, p = .64$). There were no significant differences between families who did and did not participate at the 10-year visit in terms of race, $\chi^2(3, N = 427) = 2.77, p = .43$, 2-year socioeconomic status, $t(413) = -0.48, p = .64$ and 2-year externalizing T-score ($t(425) = -.98, p = .33$). A significant difference was found for gender, $\chi^2(1, N = 427) = 4.12, p < .05$, with more females than males participating in the 10-year visit. However, preliminary analyses indicated that this difference did not significantly influence the variables analyzed in the current study. Final participants for the current study included 329 children (172 girls; 157 boys; 71% White, 29% African American).

Procedures and Measures

Children and their mothers participated in the study when the children were 2, 4, 5, 7, and 10 years of age. Typically, children's early development includes a moderate level of disruptive behavior which normatively decreases between ages two and five as children learn more regulatory skills and can better cope with developmental challenges,

meaning that the majority of children learn how conform to parental and social guidelines of behavior by the time they enter school (Campbell, 2002; Loeber and Hay, 1997; Owens & Shaw, 2003). However, there is a subset of children who fail to navigate these periods effectively and continue to exhibit symptoms of externalizing behavior problems into later childhood. This study used measures from the 5, 7, and 10 year laboratory visits as a way of assessing the nature of persistent externalizing psychopathology that extends beyond the period of normative decline in early childhood. At each age, mothers and children participated in laboratory visits where mothers were provided a detailed verbal description of the tasks that would be conducted and read and signed an informed consent form. Children and mothers participated in a series of laboratory tasks designed to elicit a variety of behaviors of developmental interest.

Externalizing symptoms. When children were 5, 7, and 10, mothers were asked to complete the Child Behavior Checklist for 4- to -18-year-olds (CBCL; Achenbach 1991; 1992) as a broad-band behavior rating scale that would be consistent across time. The CBCL is a parent-report of the child's overall adjustment, including their functioning in specific domains. The CBCL contains 112 multiple choice items rated on a scale from 0 to 2, with 0 indicating "not true (as far as you know)," 1 indicating "somewhat or sometimes true," and 2 indicating "very true or often true."

The CBCL has adequate psychometric properties, including internal consistency ($\alpha = .93$), test-retest reliability, and longitudinal stability that can discriminate between clinically referred and non-referred children (Achenbach 1991; 1992). Because the

current study was interested in children's externalizing behavior problem trajectories over time, the CBCL *externalizing score* was used where higher scores indicated more externalizing symptoms. Although the CBCL includes *T*-scores for each subscale, for the purpose of this study, the total scores of the externalizing subscale was used in order to allow for maximum variation across the sample with a possible range from 0 to 40. On average, scores were lower as the children aged. Means and standard deviations of the externalizing behavior total raw scores are in Table 1.

Child temperament. When children were five years of age, mothers completed the short version of the Child Behavior Questionnaire (CBQ; Goldsmith & Rothbart, 1991), a measure of temperament for 3- to 8-year-old children. The short form of this measure included 94 items. The parent was asked to read the items about their child's reaction to a variety of situations and decide to what extent each item is true or untrue. Each item was rated on a scale from 1 to 7, with the additional option of selecting "N/A" or "Not Applicable." A response of "1" indicated "Extremely Untrue," a response of "4" indicated "Neither True nor Untrue," and a response of "7" indicated "Extremely True."

The short form of the CBQ yields 15 subscales. *Activity Level* measures gross motor activity, including the rate and extent of the locomotion. *Anger/Frustration* measures the amount of negative affect related to interruption of ongoing tasks or goal blocking. *Attentional Focusing* measures the tendency to maintain focus on a particularly task. *Discomfort* measures the amount of negative affect related to sensory qualities of stimulation. *Fear* measures the amount of negative affect related to anticipated pain,

distress, or situations that might be frightening. *High Intensity Pleasure* measures the amount of pleasure related to situations involving high stimulus intensity, rate, complexity, novelty, and incongruity. *Impulsivity* measures the speed at which a response is initiated. *Inhibitory Control* measures the capacity to plan and to suppress inappropriate approach responses under instructions or in novel or uncertain situations. *Low Intensity Pleasure* measures the amount of pleasure involved in situations with low stimulus intensity, rate, complexity, novelty, and incongruity. *Perceptual Sensitivity* measures the extent to which slight, low intensity stimuli from the external environment can be detected. *Approach/Positive Anticipation* measures the amount of excitement for expected pleasurable activities. *Sadness* measures the amount of negative affect and lowered mood and energy related to exposure to suffering, disappointment, and object loss. *Shyness* measures the extent to which a slow or inhibited approach occurs in situations involving novelty or uncertainty. *Smiling/Laughter* measures the amount of positive affect in response to changes in stimulus intensity, rate, complexity, and incongruity. *Soothability* measures the rate of recovery from distress, excitement, or general arousal. Internal consistency was partially demonstrated. Of the 15 scales, 11 showed alphas over .70 and 14 over .60 (Putnam & Rothbart, 2006).

Factor analyses have reliably shown that these scales reliably cluster into three large factors (Rothbart & Putnam, 2002). *Surgency/Extraversion* primarily comes from the scales of Impulsivity, High Intensity Pleasure, Activity Level, and, loading negatively, Shyness. There are also substantial loadings for the Positive Anticipation and

Smiling/Laughter scales. *Negative Affectivity* primarily comes from the scales of Sadness, Discomfort, Anger/Frustration, Fear, and, loading negatively, Falling Reactivity/Soothability. *Effortful Control* primarily comes from the scales for Inhibitory Control, Attentional Focusing, Low Intensity Pleasure, and Perceptual Sensitivity. Effortful Control may be a precursor to Conscientiousness in adults. For the current study, the Negative Affectivity factor was used to indicate the difficulty of a child's temperament, with higher scores representing more difficult/negative temperaments.

Emotional climate. At age five, children and their mothers participated in five tasks designed to elicit common mother-child interactions. These tasks included a *block task*, in which the mother was instructed to teach her child to replicate a model made from blocks (4 min); a *puzzle task*, in which the mother was instructed to allow the child to complete a puzzle independently and only help if the child specifically asks them (4 min); a *free play task*, in which the mother and child were given an assortment of toys and instructed to play together as they would at home (5 min); a *clean-up task*, in which the mother was instructed to help the child clean up their toys (3 min); and a *pretend play task*, in which the mother-child dyad was given another set of toys and the mother was instructed to direct the child's play (6 min). The emotional climate of mother-child interactions were coded during these interactive episodes. The coding system (Smith et al., 2004) examined a global index of maternal positivity during parent-child interactions. This measure of parent positivity assessed the extent to which the parent expressed warmth and positive emotions toward the child. The mother's tone of voice and facial

expressions were used as indicators for this dimension. These measures were coded once for each episode on a 4-point scale, ranging from low levels of positive behavior to high levels of positive behavior. Four coders trained on 10 percent for reliability. The reliability kappa between each pair of coders was above .70 for each dimension. In order to measure overall *emotional climate*, an average score was calculated from the six positivity codes associated with each task, with higher scores indicating a more positive/warm emotional climate and lower scores indicating a less positive/warm emotional climate.

Ethnicity and socioeconomic status. In addition, mothers also completed a demographic information form to assess socioeconomic status and ethnicity at age five. From information collected on this form, the socioeconomic status score was calculated by combining information on sex, marital status, education, and occupation, and was analyzed as a continuous variable (Hollingshead Index, 1975). Ethnicity was assessed using a self-report demographic information form completed by the mothers. Mothers reported on the ethnicity of themselves and their children, and were then divided into dichotomous groups (Caucasian and African American) to assess ethnicity.

Physical punishment. Literature examining physical punishment indicated that parents who chose to use physical punishment as a form of discipline when children were young often continued to do so as children get older (Gershoff, 2002). Analyses of the data provided by cohort two of the current data set corroborated these findings, indicating that the use of physical punishment at age five was significantly predictive of the

continued use of physical punishment at age seven ($r = 0.54, p < .01; F = 44.34, p < .00$). Therefore, for the current study, physical punishment was measured at age seven as opposed to age five because more consistent and comprehensive data for all three cohorts was available at that time point.

At age 7, mothers were asked to complete the Alabama Parenting Questionnaire, which was designed to assess specific dimensions of parenting that have been linked to disruptive child behaviors (APQ; Shelton, Frick, & Wootton, 1996). The Alabama Parenting Questionnaire (APQ) is a 42-item scale designed to assess several important aspects of parenting practices related to children's disruptive behaviors, including parental involvement, monitoring/supervision, use of positive parenting techniques, inconsistency in discipline, and harsh discipline. Previous research (cited in Shelton, Frick, & Wootton, 1996) has found that these parenting techniques (i.e., use of inconsistent/ excessively negative practices and lack of positive strategies) have been linked with child disruptive behavior. Parents are asked to rate the frequency of their parenting practices by responding to items such as "I praise my teen if he/she behaves well" on a scale of 1 to 5 (1=never, 2=almost never, 3=sometimes, 4=often, 5=always).

For this study, the *Corporal Punishment* subscale was used. The *Corporal Punishment* subscale (items 33, 35, 38) asks about the frequency with which parents used physical punishment including spanking, slapping, and hitting the child with objects (i.e. "You spank your child with her hand when he/she has done something wrong," "You slap your child when he/she has done something wrong," and "You hit your child with a

belt, switch, or other object when he/she has done something wrong”). The internal consistency ($\alpha = .46$) of this measure was moderately low, possibly due to the scale only having three items that ask about three distinct forms of physical punishment. However, the corporal punishment scale has other adequate psychometric properties including divergent validity ($r = .19$) and longitudinal stability ($\alpha = .69$), which suggested that the internal consistency measurements may underestimate reliability due to the fact that parents tend to prefer one form of physical punishment (Shelton, Frick, & Wootton, 1996). This would lower the internal consistency of the scale because there was not a high degree of intercorrelation among items on the scale. The score on this subscale was calculated as the sum of items, and have a possible range between 3 and 15, with higher scores indicating more frequent physical punishment experiences. According to Shelton, Frick, & Wootton, 1996, participants’ scores on this scale were “elevated” if scores were more than one SD above the mean.

Data Analysis Outline

First, descriptive analyses were conducted on all study variables to examine the normality of all measures (see Table 1). Bivariate correlations between all variables were examined. A latent growth curve (structural equation modeling) approach was used to examine level and changes over time of externalizing behavior problems (LGM; Duncan, Duncan, Strycker, Li, & Alpert, 1999; Muthen, 1991). Analyses were conducted with the Mplus software package using the limited information maximum likelihood estimator, and the maximum likelihood complete sample approach to missing data (Muthen &

Muthen, 1998-2007). The use of latent growth modeling for longitudinal analyses accounts for missing data longitudinally under the assumption that data are missing at random. Specifically, these analyses were conducted using full information maximum likelihood estimation. Thus, parameters were estimated using all available data from the 329 participating children including those children for whom there were some missing data. In a LGM framework, researchers are primarily interested in finding the latent factors that are assumed to give rise to the observed data (Bollen & Curran, 2006). In LGM, development in a particular concept is described by two factors. The first factor, the level factor, describes the initial level (level mean) and individual differences in the initial level (level variance). The latent factor “level” is a constant for any given individual across time. Therefore, the factor loadings are set at 1 for each point in time. The second factor, the slope factor, describes the growth or rate of change (slope mean) and individual differences in rate of change (slope variance). The factor loadings for the slope factors are either fixed or freely estimated depending on the theorized pattern of growth (e.g., linear or non-linear).

Using a LGM is advantageous for several reasons (Bollen & Curran 2006). First, a LGM provides summary measures to characterize an underlying trajectory that has given rise to a large set of observations. Therefore, the initial level of externalizing behavior problems and the shape and rates of change over time can be analyzed through LGM. Second, various functional forms of change over time can be analyzed. Changes can be linear or quadratic. Third, covariates can be incorporated to explain individual

variability in the initial level of externalizing behavior problems and rates of change over time. For example, children who experience physical punishment may have higher levels of externalizing behavior problems at the start, as well as slower decreases in externalizing behavior problems over time. Finally, covariation between the initial level and rates of change can also be examined. For example, children that start with a higher level of externalizing behaviors problems may experience a slower decrease in externalizing behavior problems over time.

In short, LGM allows researchers to simultaneously assess the overall trends (the group level trajectory), along with individual variability in such trends. This is especially attractive for a longitudinal model of externalizing behavior problems, as LGM allows for variation in the individual pathways that children take in their externalizing behavior problem levels over time. Furthermore, LGM allows researchers to fully assess continuous changes over time, as opposed to the temporal analysis of two time points, which only provides snap shots of continuous trends.

Formally, within a multi-level framework, a LGC model can be expressed by the following equation (Bollen & Curran, 2006): Level 1: $Y_{it} = \alpha_i + \beta_{1i} (Time) + \beta_{2i} (Time)^2 + e_{it}$ where Y_{it} is the dependent variable, externalizing behavior problems for participant i at time t , α_i is the estimated intercept, which reflects the initial level of externalizing behavior problems at the beginning of the time series for participant i , and β 's reflect rates of change over time. While β_1 captures linear changes (increases or decreases) in the level of externalizing behavior problems over time, β_2 reflects nonlinear changes

(acceleration or deceleration) in the level of externalizing behavior problems over time. Therefore, the level of externalizing behavior problems is a function of the mean initial level of behavior problems at the beginning of the study period (Time = 0), as well as the linear and nonlinear effects of Time, indicated by β 's. Any discrepancies between the predicted and the observed levels of crime are assumed to be caused by unknown variables subsumed by e_{it} .

In order to capture individual variability in both the initial level and the rate of change over time, LGM further postulate Level 2 equations: Level 2: $\alpha_i = \mu_\alpha + \zeta_{\alpha i}$, $\beta_{1i} = \mu_{\beta 1} + \zeta_{\beta 1i}$, $\beta_{2i} = \mu_{\beta 2} + \zeta_{\beta 2i}$. In the Level 2 equations, each LGM parameter estimate in the Level 1 equation becomes a dependent variable. By specifying $\alpha_i = \mu_\alpha + \zeta_{\alpha i}$, the initial level of externalizing behavior problems for participant i is a function of the mean level of externalizing behavior problems at Time = 0 along with a physical punishment term, $\zeta_{\mu i}$. This added physical punishment term captures the individual variability in the level of externalizing behavior problems at the initial time point. Similarly, $\beta_{1i} = \mu_{\beta 1} + \zeta_{\beta 1i}$ means the linear rate of change in the level of externalizing behavior problems for participant i is a function of the mean linear change plus individual variability, $\zeta_{\beta 2i}$. Furthermore, $\beta_{2i} = \mu_{\beta 2} + \zeta_{\beta 2i}$ indicates the nonlinear change in the level of externalizing behavior problems for participant i is a function of the mean nonlinear change plus individual variability captured by $\zeta_{\beta 2i}$. μ_α , $\mu_{\beta 1}$, and $\mu_{\beta 2}$ are fixed effects (means) that capture the group-level trend in the trajectory of externalizing behavior problems overtime. Other parameters, $\zeta_{\alpha i}$, $\zeta_{\beta 1i}$, and $\zeta_{\beta 2i}$, are variance components that capture the individual variability in the

trajectory of externalizing behavior problems rates over time. With these two types of parameters, LGM allow the simultaneous analysis of group-level trends, as well as individual variability in changes in the level of externalizing behavior problems over time.

By conceptualizing random coefficients as latent variables, the treatment of time in LGM is as a model parameter, rather than as fixed data. Determining the most appropriate values for the time steps is a process of curve fitting (as it is in other longitudinal data analysis methods). In the current study, after examination of the raw data, different functional forms for externalizing behavior problems were considered where the intercept was coded to indicate children's average level of externalizing behavior problems at the beginning of the developmental period examined. For all models the time vector was scaled so that the final time step was equal to 1 to facilitate the interpretation. The parameterization of the different models is illustrated and explicated in Table 3.

After a suitable growth model for externalizing behavior problems was developed, the influence of predictor variables (i.e., physical punishment and moderating variables) on initial levels of externalizing behavior problem and the change in externalizing behavior problems over time was examined. The relation of externalizing behavior problems and their change over time with physical punishment was examined by regressing the latent growth curve factors on the predictor variable. Interactions of physical punishment and moderating variables were then included in the model. All

continuous variables were centered at their respective means in the multivariate analyses, allowing intercepts and means to be interpreted as estimated values equivalent to the mean of the overall sample. Centered variables were then multiplied to create the interaction terms that were included in the model. In addition to main effects of these moderators, the interaction terms between physical punishment X negative affect, physical punishment X emotional climate, physical punishment X race, and physical punishment X SES were also included in the model as predictors of the intercept and slope. Model fit was assessed with the model chi-square (X^2), the standardized root mean square residual (SRMR; Browne & Cudek, 1993; Muthen & Muthen, 1998–2007), and the comparative fit index (CFI; Bentler, 1990; Muthen & Muthen, 1998–2003), favoring the model with the smallest SRMR, the CFI closest to 1, and a non-significant X^2 value.

CHAPTER V

RESULTS

The goal of this longitudinal study was to examine the influence of physical punishment on the patterns of change in externalizing behavior problems across the later childhood period in a community sample of children at varying levels of moderating variables including child temperament, the emotional climate of the parent-child relationship, and contextual risk. Means, standard deviations, ranges, and normality statistics for all study variables are presented in Table 1. A correlation matrix of these variables is presented in Table 2.

Preliminary correlation analyses showed that physical punishment was significantly and positively correlated with externalizing behavior problems at all ages. This indicated that higher scores on measures of externalizing behavior problems were associated with higher scores on the measure of physical punishment. Physical punishment was also significantly and positively correlated with child temperament, indicating that a higher score on the measure of physical punishment was associated with more negative/difficult child temperament. Physical punishment was significantly and negatively correlated with caregiver-child emotional climate and SES, indicating that higher levels of physical punishment were associated with an emotional climate characterized by lower positivity scores and lower socioeconomic status. Correlation

analyses also indicated that negative/difficult temperament was significantly and positively correlated with externalizing behavior problems. This indicated that children whose scores indicated more negative temperamental styles also had higher scores on measures of externalizing behavior problems at all ages. Emotional climate was significantly and positively correlated with SES, indicating that children from more affluent families were also more likely to have a more positive caregiver-child relationship.

A series of t-tests was conducted to examine sex differences in the study variables. These analyses revealed that boys and girls did not differ significantly on any study variables (see Table 3). A second series of t-tests was conducted to examine race differences in study variables. These analyses revealed that Caucasian participants had significantly higher scores on measures of socioeconomic status and emotional climate (maternal positivity), whereas African American participants had significantly higher scores on measures of physical punishment. There were no significant race differences in externalizing scores at any time point or temperament (see Table 3).

Aim 1: Assess General Patterns of Externalizing Symptoms in Later Childhood. First, whether the growth trajectories of externalizing behavior problems were linear or non-linear was examined separately for boys and girls. The results of model fit, including chi-square, CFI, and estimated mean and variance parameters are summarized in Table 4. Initially, an intercept-only model was estimated, which fit very poorly and demonstrates the need for model modification. Next, a linear model was

formulated in which the factor loadings of externalizing behavior problems at T1, T2, and T3 were fixed at 0, 0.4, and 1. These models were then compared to non-linear models in which the factor loadings of T1 and T3 on the slope factor were fixed at 0 and 1, and the factor loading of T2 was estimated freely. Model fit statistics supported the adequacy of LGM models with non-linear components for both males and females (Figure 1). Among many model fit statistics available, non-significant chi-square tests and a Comparative Fit Index (CFI) with values greater than 0.9 indicate acceptable model fit (Bollen & Curran, 2006). In addition to traditional fit statistics, chi-square difference tests were also conducted to determine whether the latent growth model fit the data better than the level only and linear models. The results indicated that the latent model was significantly different when compared to the level only model, $\chi^2(7) = 93.16, p < .000$, as well as the linear model $\chi^2(2) = 29.92, p < .000$ (Muthen & Muthen, 1998–2007). Before testing the multivariate models hypothesized, a test of the latent growth curve model was performed to assess whether there was significant variance in the growth parameters of the latent variable (i.e. intercept and slope for externalizing behavior), because otherwise there would have been no need to further test the associations among these parameters (Willet & Bubbl, 2004).

Hypothesis 1. The results (Table 4) indicated that on average, externalizing behavior problems decrease over time at the population level for both males and females. This pattern was consistent with the data shown in descriptive analyses in Table 1. There was also significant variation of growth parameters across individuals, which allows for

subsequent modeling of this variation. For males, the intercept of externalizing behavior problems, and the variance around the intercept was significant, $\mu_{\alpha} = 10.33$, $t = 11.58$, and variance, $\text{var}(\zeta_{\alpha i}) = 42.28$, $t = 4.47$, which suggests that the initial level of externalizing behavior problems differed significantly from one male participant to another. The same pattern was found for female participants. For females, the intercept of externalizing behavior problems was estimated to have a significant mean, $\mu_{\alpha} = 10.83$, $t = 10.52$, and variance, $\text{var}(\zeta_{\alpha i}) = 62.07$, $t = 5.01$, which suggests that the initial level of externalizing behavior problems differed significantly from one female participant to another. Because the slope of externalizing behavior was also estimated to have a significant mean for both males and females (males: $\mu_{\beta} = -5.07$, $t = -6.38$, and variance $\text{var}(\zeta_{\beta i}) = 18.42$, $t = 2.48$; females: $\mu_{\beta} = -3.90$, $t = -4.27$, and variance $\text{var}(\zeta_{\beta i}) = 35.10$, $t = 3.50$), analyses indicated that on average, there was a significant decrease in externalizing behavior problems over time, and that the rates of changes differed significantly across the participants for both males and females. In other words, some children had a steeper, more normative decrease in externalizing behavior problems, whereas others had a more gradual decrease or no decrease at all.

Aim 2: Assess Relations between Physical Punishment and Externalizing Symptoms. Given that much of the literature concerning the association between physical punishment and externalizing behavior problems conducted thus far has been correlational and did not provide sufficient evidence to support causal theories and conclusions (Gershoff, 2002; Larzelere & Kuhn, 2005), the second aim of this study

explored the longitudinal association of these constructs by examining the main effect of physical punishment on the trajectory of externalizing behavior problems. A multivariate latent growth curve model examined whether change in externalizing behavior problems over time was predicted by the experience of physical punishment. Overall, this model fit the data well, $X^2(6) = 9.60$, $p = .14$, comparative fit index = .98; root mean square error of approximation = .09, standardized root mean square residual = .08 (Table 5) (Singer & Willet, 2003).

Hypothesis 2. The association between physical punishment and a child's initial levels of externalizing behavior problems, as well as the decline in behavior problems, was examined separately for males and females (Table 5). For girls, as expected, higher levels of physical punishment predicted higher initial levels of externalizing behavior problems ($b = 0.34$, $p < .01$) for females. In other words, girls whose parents reported higher scores on the measure of physical punishment were the same children who were reported to exhibit more symptoms of externalizing behaviors problems at the initial time point assessed. However, physical punishment was not statistically associated with female participants' change in externalizing behavior problems over time ($b = 0.08$, $p = 0.54$). Therefore, the cross-sectional association between physical punishment and externalizing behavior problems was not sustained when within-individual change was considered.

For males, a higher level of physical punishment also significantly predicted higher initial levels of externalizing behavior problems ($b = 0.10$, $p < 0.05$) but not the

change in externalizing behavior problems over time ($b = -0.03, p = 0.91$). In other words, the amount of physical punishment male participants experienced predicted their initial level of externalizing behavior problems, but not the change in externalizing behavior problems over time. This supported the subsequent hypothesis that other moderating factors should be considered when examining the association between physical punishment and persistent externalizing behavior problems.

Aim 3: Assess Moderators of the Association between Physical Punishment and Externalizing Symptoms. Despite some empirical evidence that directly linked physical punishment with negative outcomes, there has also been evidence that has shown that physical punishment was also associated with normative outcomes (see Larzelere & Kuhn, 2005 for reviews). The mixed nature of these findings indicated that the relation between physical punishment and later adjustment was far from straightforward and may have involved the interaction of multiple factors. Therefore, this study also examined multiple systems factors as moderators of the association between physical punishment and externalizing behavior problems at age 10. Separate models testing main effects of moderating variables (child temperament, emotional climate, race, SES) and their interaction effects with physical punishment on the level and slope of externalizing behavior problems were then tested for males and females (see Tables 6-9). Once again, fit indices including chi-square score, comparative fit index (CFI), and standardized root mean square residual (SRMR) were used to evaluate model fit (Singer & Willet, 2003).

In addition to physical punishment, this study also examined whether negative affect, emotional climate, race, and socioeconomic status when children were 5 years of age predicted both the rate of change in externalizing behavior problems over time and children's initial level of externalizing behavior problems when they were 5 years of age. Because of the reciprocal nature of caregiver-child relationship, the interaction between physical punishment X negative affect X emotional climate was also assessed as a predictor of the intercept and slope. These results indicated whether trajectories of externalizing behavior problems varied over time as a function of physical punishment and whether the magnitude of this relation depended on the level of moderating factors. Results are displayed in Tables 6-9.

Hypothesis 3a. The main effects of child temperament and the interaction effect with physical punishment on the level and slope of externalizing behavior problems was examined. The model fit the data well, $X^2(10) = 10.63$, $p = .39$, comparative fit index = .99; root mean square error of approximation = .03, standardized root mean square residual = .06. As expected, main effects analyses indicated that higher mean levels of externalizing behavior problems at age 5 (intercept) were predicted by a more negative temperament for both males ($b = 0.52$, $p < .00$) and females ($b = 0.43$, $p < .00$). Therefore, children who were rated by caregivers to have a more difficult/negative temperamental style also had higher levels of externalizing behavior problems at the initial time point. Despite significant main effects of negative affect on a child's initial level of behavior problems, the interaction of physical punishment and negative affect

was not a significant predictor of children's initial level of externalizing behavior problems for males ($b = 0.18, p = 0.16$) or females ($b = 0.15, p = 0.25$). In other words, the influence of physical punishment on a child's initial level of externalizing behavior problems was not significantly influenced by the child's temperamental style.

When examining the change in externalizing behavior problems from 5 to 10 years of age, main effect analyses showed that temperament was a significant predictor of this trajectory for males only. Results indicated that male participants with lower scores on the negative affect measure had a steeper decline in externalizing behavior problems over time ($b = -0.58, p < .00$). This showed that, for boys, children with less difficult temperamental styles experienced a more normative decline in externalizing behavior problems, whereas externalizing symptoms in boys with a more negative style persisted longer than would be predicted based on the population trajectory. This association was not found for female participants ($b = -0.16, p = 0.34$). Despite significant main effects, the negative affect X physical punishment interaction was not significant for males ($b = -0.38, p = 0.70$) or females ($b = -0.05, p = 0.78$), indicating that there was not a significant joint effect of negative affect and physical punishment when predicting changes in children's externalizing behavior problems over time. In other words, the influence of physical punishment on a child's externalizing behavior problem trajectory was not influenced by their temperament.

Hypothesis 3b. The main effects of emotional climate and the interaction effect with physical punishment on the level and slope of externalizing behavior problems was

examined. The model fit the data well, $X^2(10) = 14.99$, $p = .13$, comparative fit index = .97; root mean square error of approximation = .09, standardized root mean square residual = .06. Main effects analyses indicated that mean levels of externalizing behavior problems at age 5 (intercept) were not predicted by emotional climate for males ($b = -0.06$, $p = 0.69$) or females ($b = 0.03$, $p = 0.82$). This indicated that caregiver-child interaction styles were not predictive of higher levels of externalizing symptoms at the initial assessment point. In this model, females initial level of behavior problems was significantly related to levels of physical punishment ($b = 0.30$, $p < .05$), indicating that females who experienced higher levels of physical punishment also had higher initial levels of externalizing behavior problems. The interaction of these two variables approached significance for both males ($b = 0.26$, $p = 0.09$) and females ($b = 0.22$, $p = 0.09$) when predicting children's initial level of externalizing behavior problems. Therefore, this indicated a trend towards a joint effect of emotional climate and physical punishment when predicting initial levels of children's externalizing behavior problems. Although not significant at the 0.05 level in the current study, further this trend indicated that further examination may be warranted.

When examining the change in externalizing behavior problems from 5 to 10 years of age, results indicated that there was not a main effect of caregiver-child emotional climate on change over time for males ($b = -0.09$, $p = 0.72$) or females ($b = 0.01$, $p = 0.94$). In other words, children's change trajectories did not vary as a function of emotional climate alone. Despite non-significant main effects, the emotional climate

X physical punishment interaction approached significance for males only ($b = -0.51, p < .10$) indicating a trend towards a joint effect of emotional climate and physical punishment when predicting changes in male participant's externalizing behavior problems over time. This interaction was not significant for females ($b = 0.06, p = 0.70$).

Hypothesis 3c. The main effects of race and the interaction effect with physical punishment on the level and slope of externalizing behavior problems was examined. The model fit the data well, $X^2(10) = 20.71, p = .02$, comparative fit index = .94; root mean square error of approximation = .13, standardized root mean square residual = .06. Main effects indicated that mean levels of externalizing behavior problems at age 5 (intercept) were not predicted by race for males ($b = -0.16, p = 0.36$) or females ($b = -0.13, p = 0.38$). In other words, a child's reported ethnic group did not predict levels of externalizing behaviors problems at the initial time point. Similarly, the interaction of physical punishment and race was not a significant predictor of children's initial level of externalizing behavior problems for males ($b = -0.07, p = 0.69$) or females ($b = -0.03, p = 0.83$). This indicated that the association between physical punishment and initial levels of externalizing behavior problems did not vary significantly regardless of the child's ethnicity.

When examining the change in externalizing behavior problems from 5 to 10 years of age, similar results were found. Analyses indicated that neither race alone (males: $b = -0.33, p = 0.26$; females: $b = -1.06, p = 0.36$) nor the race X physical punishment interaction (males: $b = -0.06, p = 0.85$; females: $b = 0.10, p = 0.56$) predicted

change in externalizing behavior problems over time. Therefore a child's reported ethnic group did not predict rates of change in levels of externalizing behaviors problems across time. Additionally, the effect of physical punishment on a child's externalizing behavior problem trajectory did not change when the child's ethnicity was considered.

Hypothesis 3d. The main effects of SES and the interaction effect with physical punishment on the level and slope of externalizing behavior problems was examined. The model fit the data well, $X^2(10) = 12.85$, $p = .23$, comparative fit index = .99; root mean square error of approximation = .07, standardized root mean square residual = .06. Main effects analyses indicated that mean levels of externalizing behavior problems at age 5 (intercept) were not predicted by SES for males ($b = 0.05$, $p = 0.73$) or females ($b = -0.03$, $p = 0.78$). In other words, a child's reported socioeconomic status did not predict levels of externalizing behaviors problems at the initial time point. However, the interaction of physical punishment and SES approached significance as a predictor of children's initial level of externalizing behavior problems at age 5 for males only ($b = 0.39$, $p < .10$). Although not significant at the 0.05 level, this indicated that association between physical punishment and initial levels of externalizing behavior problems varied depending on the child's socioeconomic status.

When examining the change in externalizing behavior problems from 5 to 10 years of age, results were similar indicating that SES alone did not predict trajectories for males ($b = -0.09$, $p = 0.67$) or females ($b = 0.14$, $p = 0.37$). These results indicate that a child's socioeconomic status did not predict rates of change in levels of externalizing

behaviors problems across time. However, the SES X physical punishment interaction ($b = -0.67, p < .10$) trended towards significance when predicting change in externalizing behavior problems over time for males only. In other words, the effect of physical punishment on a child's externalizing behavior problem trajectory varied, although not significantly, when the child's socioeconomic status was taken into account.

Hypothesis 3e. Results indicated that the three way interaction between physical punishment X negative affect X emotional climate did not significantly predict the initial levels of externalizing behavior problems for males ($b = 0.51, p = .13$) or females ($b = 0.84, p = .21$), or the change in externalizing behavior problems over time for males ($b = -0.37, p = .23$) or females ($b = -0.43, p = .19$). It was hypothesized that children who had a less negative temperament and a more positive emotional climate would have continued to exhibit adaptive outcomes in spite of the experience of physical punishment. Contrary the proposed hypothesis, results indicated that the effects of physical punishment on initial levels of externalizing behavior problems and change trajectories of externalizing behavior problems were not influenced by simultaneous variations in levels of child negative affect or levels of positivity within the caregiver-child dyad.

CHAPTER VI

DISCUSSION

The current study investigated the effect that physical punishment and several moderating variables had on the change that occurred in children's externalizing behavior problems during the transition from early childhood into late childhood. Physical punishment was examined as a factor that predicted individual differences in children's externalizing behavior problem trajectories. Because previous studies examining the use of physical punishment as an effective strategy for changing child behavior had primarily been cross-sectional and produced mixed results (for reviews, see Gershoff, 2002; Larzelere & Kuhn, 2005), this study was particularly interested in examining this association from a longitudinal perspective using a developmental psychopathology framework to assess whether potential moderating factors at the child, family, and contextual levels predicted the effect of physical punishment on children's trajectories of externalizing behavior problems. Previous work has shown that development typically includes a moderate level of disruptive behavior which decreases between ages two and five as children learn to regulate their behavior (Campbell, 2002; Loeber and Hay, 1997; Owens & Shaw, 2003). However, there is a subset of children who do not exhibit this normative decrease and continue to exhibit symptoms of externalizing behavior problems into later childhood. Given that persistent externalizing behavior problems

have been linked to psychopathology in adolescence and adulthood (Broidy et al., 2003; Tremblay, 2000), it was important to develop a more nuanced understanding of the factors that are associated with individual differences in externalizing behavior problems into the later childhood years. Specifically, the trajectory of externalizing behavior problems was modeled from 5 to 10 years of age, as reported by the mother.

The first aim of this study was to examine general patterns of externalizing behavior problems into late childhood. Results from the latent growth model supported the prediction that, on average, externalizing behavior problems decreased over time for both males and females. Overall, females had a higher initial level of externalizing behavior problems and maintained higher levels of externalizing behavior problems over time. Both males and females showed a decrease in behavior problems over time, with a slightly sharper decline from ages five to seven. While the overall decrease in externalizing behavior problems continues into later childhood, the overall trajectory was less steep at the later time points assessed. Given that children experience a maturation of cognitive processes during this time, which has been associated with regulation processes (Ochsner & Gross, 2005), children typically learn different ways of coping with their emotions, interacting with adults, testing limits, and navigating the social world and peer interactions more independently. Important changes also occur in the developmental context during this time period as children begin to function more independently in school and with peers, providing different situations in which regulatory skills are important. However, there were significant differences between individual

trajectories for the children in the current study as expected. This highlighted the need to explore other factors that influence the developmental course of externalizing behavior problems into late childhood.

While, on average and as expected, children's externalizing behavior problems decreased from ages 5 to 10, there was also significant variability in the intercept and slope, indicating that there were important individual differences in the trajectory of externalizing behavior problems over time. In exploring physical punishment as a predictor of individual differences in this trajectory, it was found that physical punishment predicted the intercept for boys and girls, but not the slope of this trajectory for boys or girls. Results indicated that participants who experienced higher levels of physical punishment were more likely to have higher initial levels of externalizing behavior problems at age 5. It stands to reason that children who required more corrective interventions, such as physical punishment, would have also exhibited more maladaptive behavior when compared to those not needing interventions as frequently (Gallagher, 2002). Contrary to the current hypothesis, physical punishment by itself did not predict individual differences in the trajectory of externalizing behavior problems for girls or boys. In other words, the cross-sectional association between physical punishment and externalizing behavior problems, as shown in previous studies (Bates, Pettit, Dodge, & Ridge, 1998; Rubin, Burgess, Dwyer, & Hastings, 2003; Leve et al., 2005) was not sustained when within-individual change across time was considered. This finding further elucidated that the relation between physical punishment and later

socio-emotional adjustment was far from straightforward and involved the interaction of multiple factors on multiple levels of analysis. Given that children's development is complex, and continues to be refined and changed across childhood, it is important to consider the multiple factors that may lead to multifinality. Therefore, the third aim of this study was to assess what child, parent, and contextual factors influence the variability in children's trajectories of externalizing behavior problems through childhood.

The current study also examined systems factors as moderators of the association between physical punishment and externalizing behavior problems over time. In addition to physical punishment, this study also examined whether temperament, emotional climate, race, and socioeconomic status predicted both children's initial level of externalizing behavior problems when they were 5 years of age as well as the rate of change in externalizing behavior problems over time. The interaction terms between physical punishment and each moderator were included in the model as predictors of the intercept and slope, and this was done separately for males and females. Because of the reciprocal nature of caregiver-child relationship, an interaction between physical punishment, temperament, and emotional climate was also assessed as a predictor of the intercept and slope. Significant main effects and interactions emerged predicting initial levels of externalizing behavior problems at 5, as well as the change in externalizing behavior problems from 5 to 10 years of age.

As shown in previous research, child temperament has been found to have direct effects on externalizing problem behaviors (e.g., Eisenberg, Cumberland, Spinrad, Fabes,

Shepard, Reiser, et al., 2001). As expected, the current study also found that higher mean levels of externalizing behavior problems at age 5 were predicted by a more negative temperament for both males and females. Results indicated that children with higher scores on the negative affect measure had a higher initial level of externalizing behavior problems. Specifically, children who had more difficult temperaments had the highest parental reports of externalizing behavior problems at 5. In general, children who had less difficult temperaments had lower initial levels of externalizing behavior problems. Significant main effects of temperament also emerged when predicting the change in externalizing behavior problems from 5 to 10 years of age for males only. Male participants who had a more negative temperamental style had a slower decline in externalizing behavior problems over time when compared to males with less difficult temperamental styles. Contrary to hypotheses, the interaction between temperament and physical punishment did not predict change in externalizing behavior over time for males nor females, indicating that a joint effect of negative affect and physical punishment did not predict changes in children's externalizing behavior problems over time. Based on current longitudinal analyses, negative temperament emerged as a more influential factor in predicting the stability of externalizing behavior problems over time regardless of the physical punishment experience.

As reviewed, children have constitutionally based individual differences in reactivity and self-regulation, which influence their behavioral repertoire and, subsequently, their experiences within a given environment. The way in which children

automatically respond to their environment, as determined by temperamental characteristics, explains why some children continue to respond to the environment in primarily negative ways while others respond in primarily positive ways despite the experience of physical punishment. In addition, through this automatic response to their environment difficult children may elicit experiences that solidify their temperamental qualities, increasing the likelihood that more negative behavior will continue regardless of corrective intervention. Therefore, the very children who elicit use of frequent corrective interventions appear to be the children who continue exhibiting higher levels of externalizing behavior problems despite intervention (Dadds & Salmon, 2003; Knafo & Plomin, 2006; Shannon et al., 2007). While temperamental characteristics play an important role in determining behavioral outcomes, however, they are not deterministic. Children who have a more negative disposition still experienced an overall decline in externalizing behavior problems, although less steep than children with less difficult temperamental styles.

A similar pattern was found when assessing the influence of the caregiver-child emotional climate and its interaction with physical punishment on individual differences in the trajectory of physical punishment. The measure of caregiver-child emotional climate gave an indication of the level of parental warmth within the caregiver-child relationship and had important implications for understanding the differential effects of physical punishment, specifically for males. Results indicated that parental positivity alone was not predictive of either initial levels of externalizing behavior problems or the

change in externalizing behavior problems over time. This pattern of result was found for both males and females. The interaction between physical punishment and emotional climate, however, approached significance when predicting initial levels of behavior problems for males. Therefore, the joint influence of physical punishment and parental positivity trended towards prediction of initial levels of externalizing behavior problems for male participants. This suggests that males may be more sensitive than females to the influence of parental characteristics within the parent-child relationship.

The interaction between emotional climate and physical punishment as a predictor of the change in externalizing behavior problems over time approached significance for boys, indicating that a joint effect of emotional climate and physical punishment trended towards influencing changes in boys' externalizing behavior problems from ages 5 to 10. Although not significant, these findings suggested that the positivity in the caregiver-child relationship in conjunction with the type of discipline trend toward determining the adaptability of child outcomes. Research has consistently shown that boys are more sensitive to negative disruptions in the parent-child relationship (Van Ijzendoorn et al., 2000), putting them at greater overall risk for maladaptive outcomes. Therefore, it was not surprising that male participants' behavioral outcomes were more sensitive than female participants to the caregiver-child emotional climate, as well as an aggressive form of discipline.

Another parenting factor that was not assessed in the current study but may help explain differential developmental outcomes for males and females is the appropriateness

of caregivers' attitudes and expectations about developmentally appropriate child behavior. Parental attitudes and expectations may be particularly informative when examining the differential effect of physical punishment on children's outcomes. Parental beliefs about the causes and typicality of their children's behavior determine the way in which the caregiver responds to the child (Rodriguez, 2003). For example, norms and gender stereotypes have emerged based on the noted biological differences between males and females. For example, because boys are less likely to understand, accept, and adjust their behavior to align with societal norms as quickly as girls, they typically experience harsher physical punishment more frequently (Cote & Azar, 1997; Sorbring, Rodholm-Funnemark, & Palmerus, 2003). Similarly, Keenan & Shaw (2003) found that parents of boys use more aggressive language when implementing physical discipline, lowering the level of warmth in the parent-child emotional climate. This type of parent-child interaction may facilitate more negative interpretations of physical punishment and increase behavior problems, thus creating a self-fulfilling cycle for boys.

Several scientific investigations have supported an association between parental attitudes and approaches to punishment, subsequent parent-child conflict, and developmental outcomes. Patterson, Reid, and Dishion (1992) postulated that cycles of negative parent-child interactions lead to poor developmental outcomes, not the type of punishment itself. For example, behavior problems in preschool and early childhood have been shown to be directly related to the conflict created by developmentally inappropriate parental attitudes toward discipline (Shaw, Criss, Schonberg, & Beck,

2004). Thus, caregiver characteristics that represent risk factors for maladaptive outcomes associated with physical punishment may include developmentally inappropriate expectations about their child's behaviors, which can lead to lower parental warmth and subsequent patterns of negative caregiver-child interactions. Conversely, appropriate expectations and parental warmth represent protective factors.

A similar pattern was found when assessing the influence of the socioeconomic status and its interaction with physical punishment on individual differences in the trajectory of physical punishment. The measure of SES gave an indication of the family's functioning within environmental context and had important implications for understanding the differential effects of physical punishment, specifically for males. Results indicated that SES alone was not predictive of either initial levels of externalizing behavior problems or the change in externalizing behavior problems over time. This pattern of result was found for both males and females. The interaction between physical punishment and SES, however, approached significance when predicting initial levels of behavior problems for males. Therefore, the joint influence of physical punishment and SES trended towards prediction of initial levels of externalizing behavior problems for male participants. This suggests that males may be more sensitive than females to environmental factors that influence the context in which physical punishment is experienced.

The interaction between SES and physical punishment as a predictor of the change in externalizing behavior problems over time also approached significance for

boys, indicating that a joint effect of SES and physical punishment trended towards influencing changes in boys' externalizing behavior problems from ages 5 to 10. Although not significant, these findings suggested that the increased contextual risk, as evidenced by SES, in conjunction with the type of discipline trend toward determining the adaptability of child outcomes. Again, research has consistently shown that boys are more sensitive to negative disruptions in their environments (Van Ijzendoorn et al., 2000), putting them at greater overall risk for maladaptive outcomes. Therefore, it was not surprising that male participants' behavioral outcomes were more sensitive than female participants to differences in SES.

However, when assessing the influence of the race and its interaction with physical punishment on individual differences in the trajectory of physical punishment, no significant findings emerged. Results indicated that race alone was not predictive of either initial levels of externalizing behavior problems or the change in externalizing behavior problems over time. This pattern of result was found for both males and females. In addition, the interaction between physical punishment and race was not a significant predictor of initial levels of behavior problems for males or females. Therefore, there was not a joint influence of physical punishment and race trended towards prediction of initial levels of externalizing behavior problems for male or female participants. The interaction between race and physical punishment as a predictor of the change in externalizing behavior problems over time was also not significant for males or females, indicating that there was not a joint effect of race and physical punishment that

influenced changes in children's externalizing behavior problems from ages 5 to 10.

The cultural context in which a child experiences physical punishment has been shown to influence how the child perceives and reacts to that experience (Bronfenbrenner, 1979). As previously discussed, past research indicated that some ethnic groups were more accepting of the use of physical punishment as a form of punishment (Amato & Fowler, 2002; Javo, Ronning, Heyerdahl, & Rudmin, 2004; Lau, Litrownik, Newton, Black, & Everson, 2006). The level of cultural acceptance by particular ethnic groups may then contribute to the variability in developmental outcomes associated with the experience of physical punishment (Dodge, 1986; Smith, Springer, & Barrett, 2010). Subsequently, it has been shown that within ethnic groups that historically accept the use of physical punishment as traditional (e.g. African American), children have fewer maladaptive outcomes when compared to children from other ethnic groups that are less accepting of this discipline technique (Grogan-Kaylor & Otis, 2007; Lansford et al., 2005; Smith, Springer, & Barrett, 2010). One possible explanation for insignificant findings in the current study in regards to race may have been the geographic region in which the study was conducted. Specifically, research has shown that the southeastern region of the United States was historically, and continues to be, more accepting of the use of physical punishment (Hicks-Pass, 2009; Zolotor, Theodore, Runyan, Chang, & Laskey, 2011). When children perceived physical punishment as a normative form of discipline intended to shape behavior, they were less likely to react negatively because of the cultural understanding that the punishment was related to the

inappropriate behavior and not their self-worth or the quality of the caregiver-child relationship (Dodge, 1986; Lansford et al., 2005; Smith, Springer, & Barrett, 2010). Therefore, children from this region may view physical punishment similarly regardless of race given the overall cultural acceptance of that discipline technique.

Limitations, Implications, and Future Directions

The goal of the current study was to provide greater understanding of how the multi-level influences that determine the adaptability of child outcomes associated with the experience of physical punishment work together. Unlike other models that have attempted to clarify these associations, the current model emphasized a DP perspective as a way to conceptualize the child's ability to adjust behavior adaptively in response to physical punishment. Results of this study indicated that discipline technique, child, and family factors were all related to early externalizing behavior problems as well as the persistence of those behaviors into later childhood. While this study added to the literature by examining these factors in a diverse longitudinal sample that extended research into later childhood, there were some limitations.

First, the sample was over-selected for externalizing behavior problems and thus may not have been representative of community samples. However, it should be noted that the overall pattern of decline in externalizing behavior problems over time found in previous studies (Campbell, 2002; Loeber and Hay, 1997; Owens & Shaw, 2003) was replicated in this sample. Second, measures of externalizing behavior problems were obtained exclusively through maternal report. Given that measures of physical

punishment, child temperament, race, and socioeconomic status were also measured through maternal report, there was a greater likelihood of single-rater bias. However, the measure of emotional climate was based on observed mother-child interaction and would not have suffered from this potential problem. In addition, there is some evidence that maternal reports of externalizing behavior problems are valid measures of children's observed externalizing behavior problems (Achenbach, Edelbrock, and Howell, 1987). It is also important to consider that in longitudinal studies across childhood, externalizing behavior problems are assessed in different types of tasks at different time points. Maternal reports of children's externalizing behavior problems, therefore, are one of the best methods for examining the trajectory of externalizing behavior problems from 5 to 10 years of age given the need to use the same measures across the different assessments periods (Singer & Willett, 2003). Third, the measure of physical punishment used in the current study could have had limitations and may have contributed to the lack of significant findings. Specifically, the scale's internal consistency was moderately low. This may be due in part to the fact that the scale only has three items that ask about three distinct forms of physical punishment. However, scale used has other adequate psychometric properties including divergent validity and longitudinal stability. This suggests that the internal consistency measurement may underestimate reliability due to the fact that parents tend to prefer one form of physical punishment (Shelton, Frick, & Wootton, 1996). Fourth, although literature examining the use of physical punishment indicated that parents who chose to use physical punishment as a form of discipline when

children were young often continued to do so as children get older (Gershoff, 2002), the use of seven year data to predict longitudinal trajectories that ended at age ten may not provide the most comprehensive explanation of change trajectories. A follow up study that extends growth curves further in time, or having an earlier measure of physical punishment, would be necessary to fully assess the association between physical punishment and persistent externalizing behavior problems.

Despite limitations, several important points emerged from the current findings regarding individual differences in the trajectory of externalizing behavior problems. First, the normative decline in externalizing behavior problems found in early childhood continued into later childhood for most children. However, there was still a subset of older children who continued to have persistent externalizing behavior problems. Second, physical punishment alone was not enough to predict individual differences in change trajectories. Moderating factors at both the child and family level played a significant role in determining the multifinal outcomes associated with the experience of physical punishment. Lastly, this pattern of results indicated that the further away in proximity from the child the moderating factors became, the less significant their influence on individual differences in the change trajectory of externalizing behavior problems.

These results confirmed the necessity of parent, educators, and mental health professionals working with children to pay attention to the multiple influences on individual differences in the trajectory of externalizing behavior problems. The

implications for a child who continues to exhibit persistent externalizing behavior problems into later childhood have been well-documented and have an impact on the well-being of families, educational institutions, and other places where children are the focus. While these results showed that physical punishment alone was not sufficient to predict individual differences in this trajectory, there was evidence that the association between physical punishment and child and family factors was influential in determining behavior outcomes. Continuing to focus on the reciprocal nature of these systems in future studies will continue to shed light on why discipline techniques, such as physical punishment, are efficacious for some children and not others. These implications highlight the need for parents, educators, and mental health professionals to stay informed of the developmental research that guides their work with children and families.

These results have important implications for both developmental research and practical application. Although the field has gained a better understanding of the developmental patterns associated with the experience of physical punishment, the continuum of normative and non-normative development warrants further examination. This could be accomplished in many ways, but taking this continuum into account when recruiting participants and examining results is an important first step. The methodological challenges described, such as the inappropriate use of correlational data to draw conclusions, should be taken into account as well. As previous research has suggested, it is important to design research studies that examine the nonsymptomatic precursors of maladaptive outcomes in order to truly understand various etiological

pathways to different symptom manifestations (Gilliom and Shaw, 2004). For example, a longitudinal study that examines outcomes across a wide variety of punishment techniques would be informative. Grouping subjects by the type of punishment technique used and further matching the subjects in terms of the other risk factors present (temperament, SES, parenting style) would provide insight into the unique role of the physical aspect of physical punishment. Using one assessment point to predict outcomes at the next assessment point as the sample ages would also provide insight into the potential role of timing when associated with the experience of physical punishment. It is expected that this type of study would find that the outcomes associated with physical punishment do not differ from other forms of punishment when other risk factors are accounted for. Once this has been established, it would then be necessary to parse out which person-centered and contextual risk factors pose the greatest threat to adaptive outcomes by comparing various risk combinations within subjects that experience the same punishment technique. These studies would serve to inform a multi-level developmental framework by providing more insight about which factors, and to what extent, determine multiple developmental pathways.

There are also several implications for clinical intervention. Identification of risk and protective factors that contribute to the quality of developmental outcomes associated with the experience of physical punishment would be very informative when choosing appropriate diagnoses and interventions. For example, once protective factors have been identified a clinician would then be able to use them as a way to capitalize on the

strengths of the client and the family. Risk factors, such as negative caregiver-child emotional climate, can then be targeted as areas of weakness and interventions can be designed to reduce the number of risks while maintaining or increasing protective factors. For example, because more temperamentally difficult children were found to be at a greater risk for maladaptive outcomes associated with physical punishment than other children, intervention should target parenting strategies through education about developmentally appropriate expectations and modeling of effective behavioral management techniques, as well as child-centered behavioral strategies for managing emotions more appropriately. These interventions would serve to reduce risk factors, such as the possibility of increasingly hostile parent-child interactions, while also increasing protective factors by allowing the family to succeed. Through reliance on the families willingness to disclose such risk factors, this approach would also allow families to actively participate in treatment planning, which has been shown to increase the likelihood of success (Graves & Shelton, 2007). Developmental psychopathology (Masten, 2006) calls for research that examines the etiology of developmental patterns on multiple levels, which offers the field an excellent opportunity to uncover a more valid but also more complex picture of adjustment than currently exists, and consequently the prospect of more effective prevention and intervention programs.

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APPENDIX A. TABLES

Table 1

Descriptive Statistics for Study Variables

<i>Measures</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Skew</i>	<i>Kurtosis</i>
Predictor							
Physical Punishment	293	4.64	1.50	3.00	10.00	0.98	0.63
Outcomes							
Externalizing Behavior at 5	321	10.09	7.59	0.00	38.00	0.84	0.38
Externalizing Behavior at 7	297	7.49	6.26	0.00	30.00	0.97	0.58
Externalizing Behavior at 10	274	5.54	5.86	0.00	34.00	0.92	0.46
Moderators							
Child Temperament	322	3.97	0.70	1.90	5.82	0.04	-0.07
Emotional Climate	314	2.66	0.70	1.00	4.00	-0.08	-0.67
SES	321	43.58	10.45	14.00	66.00	-0.33	-0.31
		C (%)	AA (%)				
Race	329	234(71)	95(29)				
		M (%)	F (%)				
Gender	329	157(48)	172(52)				

Table 2

Zero Order Correlation Matrix for Study Variables

Variable	1	2	3	4	5	6	7	8	9
1. Physical Punishment	-								
2. Ext Behavior at 5	.14*	-							
3. Ext Behavior at 7	.20**	.72**	-						
4. Ext Behavior at 10	.24**	.62**	.71**	-					
5. Child Temperament	.30**	.50**	.47**	.41**	-				
6. Emotional Climate	-.21**	.03	.04	-.05	-.02	-			
7. Race	.42**	-.09	-.08	.01	-.03	-.34**	-		
8. SES	-.10*	-.02	.03	-.02	-.05	.17**	-.12*	-	

†p<.10; *p<.05; **p<.01

Table 3

Descriptive Statistics: T-tests

Variable	Gender		Race	
	<i>t</i>	α	<i>t</i>	α
Physical Punishment	-0.15	0.88	-7.89**	0.00
Externalizing Behavior at 5	0.91	0.36	1.52	0.13
Externalizing Behavior at 7	0.44	0.66	1.41	0.16
Externalizing Behavior at 10	0.99	0.32	-0.20	0.98
	-1.02	0.31	-0.04	0.08
Child Temperament	0.71	0.48	6.43**	0.00
Emotional Climate	1.44	0.15	2.13*	0.03
SES				

[†]*p* < .10; **p* < .05; ***p* < .01

Table 4
Summary of Growth Model Fitting by Gender

Model	Intercept		Slope		Fit Indices		
	Mean	Variance	Mean	Variance	$\chi^2(df)$	CFI	SRMR
Level only (M)	1.88**	1.00	-	-	126.44	0.37	0.28
(F)	1.38**	1.00	-	-	(13)*		
Linear Model (M)	1.74**	32.70**	-1.88**	7.65**	27.03 (7)	0.89	0.13
(F)	1.40**	56.39**	-0.72**	28.35**			
Non-linear (M)	10.33**	42.28**	-5.07**	18.42*	13.29 (5)	0.95	0.08
(F)	10.83**	62.07**	-3.90**	35.10**			

Note. CFI = comparative fit index; SRMR = standardized root mean square residual

[†]p<.10; *p < .05; **p < .01

Table 5
Physical Punishment Predicting External Behavior Problems by Gender

Fixed Effects	β	SE	t	Fit Indices		
				$X^2(df)$	CFI	SRMR
				9.60(6)	0.98	0.08
Intercept						
Physical Punishment (M)	0.10	0.14	0.67*			
Physical Punishment (F)	0.34	0.12	2.90**			
Slope						
Physical Punishment (M)	-0.03	0.23	-0.12			
Physical Punishment (F)	0.08	0.15	0.62			

†p<.10; *p < .05; **p < .01

Table 6
Multivariate Growth Curve Model: Temperament Main Effects and Interactions by Gender

Fixed Effects	β	SE	t	Fit Indices		
				$X^2(df)$	CFI	SRMR
				10.63(10)	0.99	0.03
Intercept						
Physical Punishment (M)	-0.05	0.13	-0.37			
Temperament (M)	0.52	0.18	4.46**			
Temp x PP (M)	0.18	0.13	1.44			
Physical Punishment (F)	0.09	0.13	0.68			
Temperament (F)	0.43	0.12	3.64**			
Temp x PP (F)	0.15	0.13	1.16			
Slope						
Physical Punishment (M)	0.14	0.21	0.66			
Temperament (M)	-0.58	0.25	-			
			2.34**			
Temp x PP (M)	-0.38	0.22	-1.70			
Physical Punishment (F)	0.17	0.17	0.98			
Temperament (F)	-0.16	0.16	-0.95			
Temp x PP (F)	-0.05	0.17	-0.028			

†p<.10; *p<.05; **p<.01

Table 7

Multivariate Growth Curve Model: Emotional Climate Main Effects and Interactions by Gender

Fixed Effects	β	SE	t	Fit Indices		
				$X^2(df)$	CFI	SRMR
				14.99(10)	0.97	0.06
Intercept						
Physical Punishment (M)	0.15	0.15	1.01			
Emotional Climate (M)	-0.06	0.16	-0.40			
EC x PP (M)	0.26	0.15	1.71 [†]			
Physical Punishment (F)	0.30	0.12	2.43*			
Emotional Climate (F)	0.03	0.13	0.23			
EC x PP (F)	0.22	0.13	1.70 [†]			
Slope						
Physical Punishment (M)	-0.09	0.23	-0.37			
Emotional Climate (M)	-0.09	0.25	-0.35			
EC x PP (M)	-0.51	0.27	-1.91 [†]			
Physical Punishment (F)	0.09	0.16	0.55			
Emotional Climate (F)	0.01	0.16	0.07			
EC x PP (F)	0.06	0.16	0.39			

[†]p<.10; *p < .05; **p < .01

Table 8
Multivariate Growth Curve Model: Race Main Effects and Interactions by Gender

Fixed Effects	β	SE	t	Fit Indices		
				$X^2(df)$	CFI	SRMR
				20.71(10)*	0.94	0.06
Intercept						
Physical Punishment (M)	0.21	0.17	1.22			
Race (M)	-0.16	0.17	-0.92			
Race x PP (M)	-0.07	0.18	-0.41			
Physical Punishment (F)	0.43	0.15	2.92			
Race (F)	-0.13	0.15	-0.87			
Race x PP (F)	-0.03	0.15	-0.21			
Slope						
Physical Punishment (M)	0.16	0.29	0.56			
Race (M)	-0.33	0.32	-1.10			
Race x PP (M)	-0.06	0.30	-0.19			
Physical Punishment (F)	0.13	0.18	0.72			
Race (F)	-0.16	0.18	-0.91			
Race x PP (F)	0.10	0.17	0.58			

†p<.10; *p<.05; **p<.01

Table 9
Multivariate Growth Curve Model: SES Main Effects and Interactions by Gender

Fixed Effects	β	SE	t	Fit Indices		
				$X^2(df)$	CFI	SRMR
				12.85(10)*	0.99	0.06
Intercept						
Physical Punishment (M)	0.13	0.14	0.95			
SES (M)	0.05	0.15	0.35			
SES x PP (M)	0.39	0.13	2.89 [†]			
Physical Punishment (F)	0.33	0.129	2.72*			
SES (F)	-0.03	0.13	-0.28			
SES x PP (F)	-0.02	0.13	-0.18			
Slope						
Physical Punishment (M)	-0.09	0.21	-0.44			
SES (M)	-0.09	0.22	-0.42			
SES x PP (M)	-0.67	0.24	-2.83 [†]			
Physical Punishment (F)	0.15	0.15	1.01			
SES (F)	0.14	0.15	0.91			
SES x PP (F)	0.23	0.15	1.56			

[†]p<.10; *p<.05; **p<.01

APPENDIX B. FIGURE

Figure 1: Mean Trajectories of Externalizing Behavior Problems for Males and Females

