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The study of childhood aggression increasingly examines the developmental trajectories of different types of aggression. While a variety of subtyping systems exist for defining aggression, most systems seem to be consistently defining proactive (i.e. bullying, unprovoked aggression) and reactive (i.e. impulsive, in retaliation) subtypes. Keenan and Shaw (2003) have developed a causal theory which attributes infant over or underarousal, paired with caregiving that is insensitive to the needs of the child, as setting the child on either one of the aggressive pathways. The current study tests a piece of Keenan and Shaw's theory by examining child and parent correlates of proactive and reactive aggression in an early childhood sample rated as having high levels of aggression by their parents and teachers. Child variables included emotion regulation and negative emotionality. Parent variables included corporal punishment, inconsistent discipline, punitive parenting, interparental violence, and harsh physical discipline. Other demographic variables were considered, including socioeconomic status, maternal age, and child gender. Results suggest that proactive aggression is not a frequent phenomenon in early childhood, even among aggressive children, and in our study no variables uniquely predicted the subtypes. Significant limitations of the study, as well as clinical implications and future directions for research are discussed.

THE CORRELATES OF PROACTIVE AND REACTIVE AGGRESSION IN EARLY CHILDHOOD

by

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CHAPTER I

INTRODUCTION

Of the children who are referred to mental health clinics every year, the majority are seen for externalizing problems, such as hyperactivity, defiance, and aggression. Even as early as preschool, the occurrence of such behavior has been reported at rates as high as one antisocial act per day (Willoughby, Kupersmidt, & Bryant, 2001). One specific externalizing behavior, aggression, seems to be of particular importance to children's future development. Aggressive and antisocial acts have important consequences for the child and his family, as well as for the communities in which they live.

Research over the past 25 years in this area indicates that aggression is stable in the individual over time (Campbell, 1994; Loeber & Dishion, 1983; Olewus, 1979; Tremblay et al., 2004), as previous rates of aggressive behavior are the best predictors of future juvenile delinquency and recidivism rates. Children who begin to display aggression at early ages are especially likely to continue this behavior throughout their childhood into adulthood, and this is especially true of children who are displaying more severe behaviors (Campbell, Pierce, Moore, Marakovitz, & Newby, 1996; Tremblay, 2000). Generally, adults demonstrating serious aggression did not initiate this behavior in adulthood or even adolescence. Adult serious offenders, who may have such diagnoses as Antisocial Personality Disorder (ASPD) or psychopathy

frequently have histories of conduct problems in their childhood (Ingoldsby et al., 2006; Loeber & Hay, 1997).

The problem of aggressive behavior also seems to be getting worse in society overall, with more mental health professionals reporting increasing aggression over recent years in the children with whom they have contact (McAdams, 2002). Rates of arrest for both juvenile males and females have contributed to the vast increases since the 1980's (Silverthorn & Frick, 1999). Specifically, in their 2006 report, the Office of Juvenile Justice and Delinquency Prevention found that by age 17, 33% of youth had been suspended from school; 27% had assaulted someone with the intent to hurt them, and 16% carried a handgun (Snyder & Sickmund, 2006). In 2003, one out of eight students reported participating in a fight either in or out of school.

This aggressive behavior grows more severe and varied over time, and aggressive children with stable behavior in multiple settings tend to be resistant to treatment (Dodge, Lochman, Harnish, Pettit, & Bates, 1997) and have a poorer prognosis (Loeber, 1990; Shaw, Owens, Giovanelli, & Winslow, 2001; Tremblay, 2000). The addition of aggressive behavior to the diagnosis of Attention-Deficit/Hyperactivity Disorder (AD/HD) leads to a more severe clinical presentation and poorer behavioral and emotional outcomes for the child (Lynam, 1998; Shaw et al., 2001). There have been mixed findings for treatment efficacy of interventions targeting aggression and conduct problems, with some interventions even found to compound the behavior problems (Dishion, McCord, & Poulin, 1999).

Externalizing problems, particularly aggression, have been associated with maladaptive outcomes for children and adolescents. It has been demonstrated that the poorest outcomes for aggression first manifested in childhood are associated with earlier onset of aggressive behavior that is demonstrated in a variety of contexts. In particular, aggression and other externalizing behaviors have been associated with later academic failures, juvenile delinquency, and substance abuse (Ingoldsby et al., 2006; Patterson, DeBaryshe, & Ramsey, 1989; Willoughby et al., 2001). Aggressive behavior has also been associated with a lack of social competence and low peer acceptance (Sutton, Cowen, Crean, Wyman, & Work, 1999). Difficulties in peer relations are especially problematic for children's social and emotional development, as well as school adjustment.

Aggressive behavior also has important consequences for the family and community. While the majority of preschoolers with behavior problems are known to overcome their difficulties, some young children who display externalizing behaviors are on a pathway to conduct disorders and later adult antisocial behavior (Ingoldsby et al., 2006; Loeber, 1990; Campbell, Pierce, March, Ewing, & Szumowski, 1994). This behavior leads to outcomes with implications for our society, as it includes such problems as drug use, teenage pregnancy, as well as both petty crime and violent crime. The consequences of childhood aggressive behavior can persist into adulthood, with evidence that children who had severe and persistent temper tantrums became adults who were more likely to be unemployed, less satisfied in their careers, more

likely to divorce, and more likely to be ill-tempered parents (Caspi, Elder, & Bem, 1987).

Aggression Research: Measurement and Sampling Issues

There are inherent sampling issues built into the study of aggressive behavior in childhood. Most of the studies reviewed below are based on elementary school aged samples. Thus, we do not have an understanding of how aggression and its subtypes might operate in younger children. There is a need for more studies of aggressive behavior in children up to age 5. While more studies are attempting to examine aggression in various populations, the majority of studies are conducted using samples of lower middle class boys. Generally, these boys are part of an at-risk population rather than displaying clinical levels of aggressive behavior. Thus, our knowledge of aggressive behavior in girls and different social classes is limited. While the majority of these studies are conducted with mainly Caucasian samples, many have primarily African-American samples, particularly those who examine clinically aggressive rather than at-risk boys.

Subtypes of Aggression

When studied and treated as a unitary construct, aggression yields conflicting information regarding etiology and treatment. As a result of the varying presentations of aggressive behavior, some researchers believe that distinct etiological pathways and presentations are identifiable (Ingoldsby et al., 2006; Loeber & Hay, 1997; Moffitt, 1993; Silverthorn & Frick, 1999). For this reason, many subtypes of aggression and multiple diagnostic qualifiers have been used to explain the various types of

aggression observed in clinical populations. Aggression research now focuses more on the etiology and sequelae associated with different types of aggressive groups of children rather than just classifying aggressive acts (Tremblay, 2000). Thus, aggression is seen as a stable characteristic of the child that can be observed and defined across contexts (Kempes, Matthys, de Vries, & van Egeland, 2005). If this is the case, then identifying separate trajectories that groups of children tend to follow would be the first step in determining etiological factors of subtypes of aggression, and ultimately specifying the optimal treatment modality specific to each subtype.

Proactive and reactive aggression. While many subtypes of aggressive behavior have been proposed, most classification systems seem to be tapping into variations on similar constructs. Findings for the subtypes of aggression can be split into patterns of impulsive-hostile-affective-undersocialized aggression versus a pattern of controlled-instrumental-predatory-socialized aggression (Ingoldsby et al., 2006; Kempes et al., 2005; Vitiello & Stoff, 1997). This bimodal classification has a solid foundation in the ethology literature, and many studies of human aggression make the same distinction using varying labels. The first type of aggression involves autonomic arousal, anger, defensive posturing in response to threat, and a feeling of relief after the aggressive behavior. The second type consists of organized, "cold-blooded", goal oriented aggression, which is not accompanied by irritability and anger (Dodge, 1991). In an effort to synthesize the many subtyping systems, Dodge and colleagues have researched these two types of aggressive behavior that they call *proactiv*e and *reactive* aggression. Based on observations of boys in free play with peers in the laboratory

setting, as well as naturalistic observations of playground interactions, these researchers distinguish between angry reactive behaviors and non-angry proactive behaviors (Dodge, 1991). While the hostile/instrumental distinction is based mainly on the consequence of each behavior (victim vs. object oriented), the proactive/reactive distinction takes into account instigating, maintaining, and related factors.

Reactive aggression, which is akin to the frustration-aggression hypothesis view, is associated with physiological arousal and irritation (Hubbard et al., 2002) as an angry reaction to provocation, often followed by remorse for such behavior. In childhood, temper tantrums and striking back at a perceived aggressor are examples of this behavior, which is conceptualized as an effort to remove a perceived threat. In a study of second graders, reactively aggressive children had increased physiological reactions to frustration that indicated unique problems with anger (Hubbard et al., 2002). Dodge (1991) hypothesized that brain regions involved with hyperactivity and aversiveness will be most closely linked with reactive aggression. Reactive aggression has been associated with decreased serotonergic activity (Kempes et al., 2005). Support for the innate and enduring nature of reactive aggression comes from the early onset and physiological correlates of such behavior. Children who are characterized as predominantly reactively aggressive have an earlier onset of problem behavior, are more impulsive, and tend to have more attention problems (Connor, Steingard, Anderson, & Melloni, 2003; Day, Bream, & Pal, 1992; Dodge, 1991; Dodge et al., 1997). Their angry aggressive behavior often seems out of control (Dodge, 1991). These children are also at greater risk for internalizing disorders such

as anxiety and mood disorders in adolescence (Vitaro, Gendreau, Tremblay & Oligny, 1998).

Overall, purely reactive aggressive behavior is more associated with impairment, at least in childhood (Merk et al., 2005; Waschbusch, Willoughby, & Pelham, 1998), and with higher rates of school discipline problems (Brown, Atkins, Osborne, & Millnamow, 1996). In a study of 6-9 year olds, Dodge and colleagues found that having these difficulties impairs peer relations, as evidenced by the fact that they are less popular with peers and poorer at solving social problems due to a lack of social skills (Dodge et al., 1997). Thus, much like Moffitt's (1993) life-course persistent type of conduct disorder, reactive aggression is frequently associated with constitutionally based impulsivity, diagnosis of AD/HD, and greater impairment in childhood. In terms of family variables, evidence suggests that reactively aggressive children are more likely than proactively aggressive children to be victims of maltreatment by parents (Connor et al., 2004).

The behavior of proactively aggressive children, on the other hand, is considered planned and calculated, and executed without remorse (Dodge et al., 1997). Manifestations of this type of behavior include bullying or intimidating others for some gain. In a study of adolescents, proactively aggressive behavior was found to have a later age of onset, and is maintained by reinforcement of aggressive behavior, often by aggressive role models (Smithmeyer, Hubbard, & Simons, 2000). Some research has demonstrated that proactively aggressive children are more likely to be witness to inter-parental violence (Connor et al., 2004; Kempes et al., 2005)

Proactive aggression requires forethought and planning associated with more advanced cognitive development, which could also contribute to the later onset. Thus, while reactive aggression has its roots in the frustration-aggression hypothesis, proactive aggression is thought to be a result of a social learning mechanism, such as observation and imitation. In other words, this behavior is externally rewarded, which is consistent with Dodge's hypothesis that brain regions involved in appetitive functions and reward centers are associated with proactive aggression, and is fashioned after the behavior of aggressive role models (Dodge, 1991; Dodge et al., 1997). Unlike reactive aggression, proactive aggression is not associated with concomitant physiological arousal, anger, or negative emotionality, and is thus referred to as "cold-blooded". Proactive aggression has not been associated in the literature with impulsivity or AD/HD, as is the case with reactive aggression.

Research has shown that children who are primarily proactively aggressive believe that they will receive reinforcement (e.g. popularity, material gain) for their behavior, which has been demonstrated in an early elementary, primarily Caucasian sample (Dodge et al., 1997). These proactively aggressive children also feel more efficacious in their performance of aggressive acts, and have a more positive view of aggression in general (Dodge, 1991; Smithmeyer et al., 2000). When examining data from the peers of aggressive children, it seems that proactively aggressive children may be correct in their belief that they will be rewarded and admired by their peers for their aggressive behavior. During childhood and adolescence, proactively aggressive youth typically have normal peer relations and are even viewed by their peers as

having social power and desirable traits such as leadership, a sense of humor, and access to valued resources (Dodge et al., 1997; Poulin & Boivin, 2000). Somewhat similar to Moffitt's (1993) adolescent limited offenders, the behavior of proactively aggressive children seems to be learned and maintained by reinforcement, with a later onset of disruptive behavior.

Aggressive children who demonstrate both proactive and reactive aggression are categorized as pervasive-aggressive. While these children constitute the majority of aggressive youth, little research exists which investigates their outcomes relative to purely proactive and purely reactive aggressive children. Some studies neglect this category altogether, only examining the ends of the distribution that are proactive and reactive. Others conceptualize reactive aggression as earlier developing and having more serious implications for the child, and thus view the mixed type as a form of reactive aggression. Many of these studies find evidence that pervasive-aggressive children have the same outcomes as reactive children. Still others, who examine the pervasive-aggressive as an important group, find that the pervasive-aggressive group have compounded risk factors and the most negative outcomes overall. More evidence is needed before conclusions can be drawn regarding the antecedents, behavior, and outcomes for pervasively aggressive children.

Studies examining the validity of this distinction find support for this model, and most studies are able to divide aggressive children into categories of proactive, reactive, or pervasive aggressive. Most studies consistently find that, at the beginning of adolescence, near 53% of their sample are both proactively and reactively

aggressive, or pervasive aggressive. Of the remainder, nearly 32% are reactively aggressive only, and the 15% are categorized as proactive only (Brendgen, Vitaro, Tremblay, & Lavoie, 2001). One reason for the high degree of overlap is that aggression without impulsivity is relatively rare, and so the purely proactive groups are consistently very small in elementary school children (Day et al., 1992; Waschbusch, et al., 1998). This is an issue of importance because the aggressive behavior that occurs within the context of inattention and impulsivity may differ from other types of aggression. Using confirmatory factor analysis of teacher ratings of proactive and reactive aggression of Caucasian boys in late elementary school, Poulin and Boivin (2000) found that, despite the substantial overlap, a 2-factor solution fit the data better than a 1-factor solution. Despite the substantial association between proactive and reactive aggression (Day, Bream, & Pal, 1992; Dodge et al., 1997; Poulin & Boivin, 2000; Waschbusch, Willoughby, & Pelham, 1998), it is important to note that proactive and reactive aggression can be highly correlated and still be a useful distinction. The theoretical importance of the distinction lies in its ability to make meaningful consistent patterns of predictions and recommendations for intervention (Kempes et al., 2005).

In terms of construct validity, there is considerable evidence that the two differ on a number of social, behavioral, and academic factors (Atkins & Stoff, 1993; Atkins, Stoff, Osborne, & Brown, 1993; Brown et al., 1996; Connor et al., 2003; Connor et al., 2004; Day, Bream, & Pal, 1992; Dodge & Coie, 1987; Dodge et al., 1997; Price & Dodge, 1989; Smithmeyer, Hubbard, & Simons, 2000; Vitaro, Gendreau, Tremblay, &

Oligny, 1998, Waschbush, Wiloughby, & Pelham, 1998). Studies using data from teachers find that they differentially attribute social characteristics to elementary school students based on this distinction and that they are better at identifying reactive aggression (Day et al., 1992). Intervention studies have found that treatments for elementary school children that target proactive and reactive aggression based on their different correlates are more effective (Vitaro & Brendgen, 2005). Most studies have used peer data to establish the validity of the constructs; however studies using measures of overall impairment and classroom behavior also support the validity of the proactive and reactive subtypes (Waschbusch et al., 1998). Studies on brain mechanisms also have found evidence for separate neural circuitry specific to each type (Gendreau & Archer, 2005).

While there is a good deal of evidence supporting these subtypes of aggression, there are limitations to the research that raise questions as to its utility in trying to predict which children who are aggressive in preschool may continue to persist in their aggressiveness and in developing interventions that are tailored to these subtypes. First, most of the studies were conducted with elementary and adolescent samples and thus it is not clear the degree to which these subtypes exist in preschool. Second, most of the research has been conducted with participants who are primarily Caucasian, so it is not clear the degree to which these subtypes are evident across ethnicities. Finally, most of the studies used either an at-risk or normative sample. While it is important to know how these subtypes operate across the continuum of behavior, one

important purpose of the subtypes is in predicting and intervening with those children whose aggression falls in the clinical range.

Child Correlates of Aggression

Gender differences in aggression. Rates and types of aggressive behavior differ in boys and girls. It is a well-replicated finding in the aggression literature that boys engage in more aggressive behavior than girls (Connor et al., 2003; Emery, 1988; Gottman & Fainsilber, 1989; Keenan & Shaw, 1997). The male to female ratio of Conduct Disorder diagnoses is about 4:1 (Cohen, Cohen, & Brook, 1993). Explanations for this gender difference vary, with theorists proposing that the findings reflect truly higher rates of delinquency for boys as a result of biological or socialization differences, or that they are an artifact of problematic or insensitive measurement because boys and girls manifest antisocial tendencies in different ways.

The first widely accepted possibility is that boys in fact engage in more antisocial behavior than girls. In addition to socialization influences on aggression, biological differences between the sexes could also play a role in their discrepant rates of aggression. According to Silverthorn & Frick (1999) high levels of antisocial behavior is so unusual for girls that only those with preexisting individual and environmental vulnerabilities will engage in these behaviors. These authors summarize the constitutional variability model, in which disorders are less prevalent in girls (for reasons stemming from differential prenatal development) because traits in boys have more genetic variability. In girls, aggressive and disordered behavior is more likely due to a more severe neurological problem and will thus have a more

severe presentation as well. It is likely that the complex interplay of biological and social factors is the best explanation of gender differences in aggression

Keenan and Shaw (1997) have theorized that the gender differences found in externalizing behavior are a result of the different socialization practices for boys and girls. For example, female gender roles denounce aggressive behavior, and mothers encourage their daughters but not their sons to comply with feminine stereotypes and to engage in prosocial and internalizing behaviors (Keenan & Shaw, 1997). Shaw, Keenan, and Vondra (1994) found that the familial predictors of aggression differ between boys and girls. More specifically, boys' aggressive behavior was predicted by early disruptive behavior and maternal unresponsiveness, while girls' misbehavior was predicted by low maternal education and infant noncompliance. Additional gender differences in the correlates of aggression include a higher rate of sexual and physical abuse, as well as a higher rate of suicide attempts than male delinquents (Silverthorn & Frick, 1999).

Differences in caregiving behaviors for boys and girls have also been proposed as a precursor of differences in their aggressive behavior. Boys have been found to respond more aggressively to maternal control than girls (McFayden-Ketchum, Bates, Dodge, & Pettit, 1996), and there is evidence that boys are parented with a more coercive maternal style (Miller, Cowan, Cowan, Hetherington, & Clingempeel, 1993). Stronger relationships have been found between maternal use of corporal punishment and impulsive behavior for boys than girls (Straus & Mouradian, 1998). In light of many of these findings, it has been suggested that there are stronger associations

between child behavior and maternal caregiving in boys than in girls (Gottman & Fainsilber, 1989). It could be that boys are more aggressive than girls and elicit coercive parenting from their mothers. Alternatively, mothers might view boys differently and thus parent them in different ways from girls, ways that socialize them into more aggressive behavior.

In contrast, some researchers believe that these findings of gender differences are a measurement artifact of the type of aggression that is typically assessed, and that if other types of aggression were considered, then boys and girls would be similar in their overall rates of aggression (Crick et al., 2006; Crick, 1995). It may also be possible that the presentation of aggression is different for males and females, for example, Zahn-Waxler (1993) has proposed that girls are more likely to turn their aggression inward, and Lillienfeld (1992) has even proposed that girls' antisocial tendencies take the form of somatization symptoms. Such findings could also account for the higher rates of internalizing symptoms in females. These presentations may also be due largely to the differing socialization practices for boys and girls and the tight-knit social groups preferred by females. For instance, it has been found that young girls are more likely to engage in covert and verbal types of aggression, such as spreading rumors or using social means to hurt another's feelings (Crick, 1995; Lagerspetz, Bjorkqvist, & Peltonen, 1988). These authors found that aggression is less stable in females than males, which they interpret as an indication that girls' earlier social development facilitates their aggression becoming less overt sooner than for boys. In other words, indirect and covert aggression more closely resembles the

aggressive behavior that occurs in adult society, and perhaps the earlier onset of this behavior in females signals their earlier social development (Lagerspetz & Bjorkqvist, 1994). While females are as likely to react to provocation than males, they are less likely to provoke another (Lagerspetz et al., 1988). The authors found that while boys want to be more domineering, girls wish they were less so, and have difficulty admitting to or understanding their aggressive behavior. It is also possible that it is easier to dismiss or justify indirect aggressive behavior, and it is certainly easier to hide it; these measurement issues might account for the observed gender differences in aggression reported in the literature.

Gender and subtypes of aggression. While many studies focus on gender differences in other subtypes of aggression (i.e. relational vs. physical), very little research has examined gender differences in proactive and reactive aggression. In a study of referred children and adolescents, Connor and colleagues (2003) found that the correlates of proactive aggression were very similar for males and females. These included self-reported drug use, expressed hostility, a diagnosed disruptive behavior disorder, and experiencing maladaptive parenting. For reactive aggression, however, the correlates were somewhat different for boys and girls. Reactive aggression in boys was strongly related to hyperactivity and impulsivity, and in girls was related to early traumatic stress combined with low verbal IQ. No gender differences in rates or severity of reactive and proactive aggression were noted in their sample. This is the only currently published study to examine gender differences specific to proactive and reactive aggression.

Self-regulation and aggression. When considering the etiological factors that contribute to aggression, one consistently cited aspect of child functioning thought to contribute to the development of aggression is poor self-regulation. One of the most important achievements for children's development is the ability to regulate behavior and emotions, which is thought to have a neurobiological basis (Posner & Rothbart, 2000; Rothbart & Derryberry, 1981). The child's management of emotions can take the form of self-distracting or disengaging, seeking help, or self-soothing. Infants high on the temperamental construct of effortful control are better able to focus their attention, modulate emotion and tolerate frustration, and thus adjust their behavior in necessary ways, making it easier for them to learn the foundations of compliance and setting them up for future success.

Research has linked deficits in self-regulation with children's externalizing behavior among four- to eight-year olds (Eisenberg et al., 2001; Olson, Bates, & Sandy, 2003; Oosterlan & Sergeant, 1996; Schwartz & Proctor, 2000; Valiente et al., 2003). Children who are reactive, or easily frustrated, will have more difficulty complying with parental demands, which is a source of frustration for them. Deficits in self-regulation of emotions as early as five months of age have been related to child noncompliance and defiance throughout the first few years of life (Stifter, Spinrad, & Braungart-Rieker, 1999). Children with poor self-regulatory skills also have difficulties interacting with peers (Eisenberg et al., 2001) and these deficits have been linked to the development of AD/HD (Gerrard, Anastopoulos, Calkins, & Shelton, 2000). In addition to noncompliance and defiance, self-regulation has also been

related to childhood aggression (Finkenauer, Engels, & Baumeister, 2005). Eisenberg and colleagues have found that children who do not master techniques of emotion regulation become aggressive when presented with anger-provoking stimuli (Eisenberg et al., 1999; Eisenberg et al., 2001). Aggressive behavior in childhood has also been related to infants' expressions of anger; specifically negative emotionality has been found to moderate the relationship between emotion regulation and behavior problems (Rothbart, Ahadi, & Evans, 2000; Valiente et al., 2003). Thus, children who are unable to modulate emotions and soothe themselves in frustrating situations are more likely to act out in aggressive ways.

Self-Regulation and subtypes of aggression. Some research has further delineated linkages between self-regulation and subtypes of aggression. More specifically, Eisenberg (2001) has postulated that reactively aggressive children would have *greater* difficulties with self-regulation than proactively aggressive children. It is also hypothesized that the two would have differences in emotionality, but no specific hypotheses were offered for what these differences would be. Findings from Dodge's work indicating that reactively aggressive children have difficulty managing emotions in frustrating situations, tend to support Eisenberg's hypotheses and has led him and others to conclude that reactively aggressive children have unique problems with negative emotions including anger (Day, Bream, & Pal, 1992; Dodge, 1991; Dodge et al., 1997). However, in the only published study to examine specifically the relationship between emotion regulation and subtypes of aggression in Dutch elementary school boys, aggressive boys did have poorer emotion regulation than

comparison boys, but there were no differences in the emotion regulation of proactively and reactively aggressive children (deCastro, Merk, Koops, Veerman, & Bosch, 2005).

Parent Correlates of Child Aggression

As a focus for research, parenting influences, both in terms of the parent child interaction as well as exposure to violence within parents/families have been linked to the expression of childhood aggression. There is evidence to suggest that the temperament of the child, as described above, has an influence on parenting and the strategies used. For example, children's temperament and self-regulation could be related to impulsive and aggressive behavior through their impact on parents' stress and the competent use of appropriate discipline strategies. Children with high levels of negative emotionality have mothers who are more likely to report high levels of maternal stress (Calkins & Fox, 2002) be less responsive to their children (Owens, Shaw, & Vondra, 1998) and be more intrusive (Lee & Bates, 1985). Children with negative emotionality and low levels of frustration tolerance are difficult to engage, and have been shown to have lower levels of dyadic synchrony with their mothers (Skuban et al., 2006). Thus, another way of conceptualizing the interaction between child self-regulation and aggression is to examine the effects of child emotionality and temperament on parents, specifically their ability to parent effectively.

Parental discipline and aggression. A wide variety of parent variables have been identified as causal or maintaining factors in aggressive childhood behavior. Parental warmth, family adversity, parental psychopathology and antisocial behavior

have all been implicated in the development of children's aggressive behavior. No variable, however, has been as consistently associated with children's aggression as parental punitive discipline (Connor et al., 2004; Deater-Deckard & Dodge, 1997; Del Vecchio & O'Leary, 2006; Ingoldsby et al., 2006; Loeber & Dishion, 1983). For example, among oppositional and aggressive kindergartners from an ethnically and socioeconomically diverse sample, the more severe the aggression in children (defined by number and quality of symptoms), the more likely they were to experience negative parental practices such as physical aggression, spanking, and inconsistency (Stormshak, Bierman, McMahon, & Lengua, 2000). Children of aggressive mothers have higher rates of aggression than children of non-aggressive mothers (Shaw, Owens, Giovanelli, & Winslow, 2001). Children who were spanked by their mothers between ages 6 and 9 had higher levels of antisocial behavior two years later (Straus, Sugarman, & Giles-Sims, 1997).

Parenting is linked to child aggression by both the physical and emotional aspects of parenting. Children have tendencies similar to those of their parents for managing anger and expressing that anger via aggression. Thus, independently and in concert, parents' physical aggression (spanking, harsh corporal punishment) and negative emotionality (yelling, overreactive discipline, anger) are related to children's aggressive and impulsive behavior.

The effects of parental aggression appear to be both direct and indirect. In a sample of Chinese 3-6 year olds, Chang, Schwartz, Dodge, & McBride-Chang (2003) found a direct effect of father's harsh parenting (yelling, expressions of anger,

physical threats and aggression) on their children's aggression, and that mother's harsh parenting affects children's aggression through the disruption of children's emotional regulation. Other researchers have also found that a child' self-regulation mediates the relationship between parenting and child aggression. Finkenauer and colleagues (2005) found that the link between parenting behavior and child outcomes is partially mediated by a child's behavioral regulation, but that parenting contributes to child behavior independently of the child's regulatory contribution. Thus, the relationship between parenting strategies, children's emotional regulation, and children's aggressive behavior is a complex one, and it is reasonable to suspect these interactions could result in different subtypes of aggressive behavior.

Parenting and subtypes of aggression. Less research has been conducted on the etiological factors of the different types of aggression; there are few findings regarding the particular parenting strategies associated with proactive and reactive aggression. Dodge (1991) has hypothesized that reactive aggression, with its earlier onset, has its roots in early childhood, and that rejection and maltreatment by parents will be associated with such behavior. The findings of one study by Dodge and colleagues state that reactively aggressive adolescents are more likely to have experienced histories of physical abuse than proactively aggressive children (Dodge et al., 1997). Dodge also hypothesized greater attachment disruption in reactive rather than proactively aggressive children, but research so far only demonstrates a link between insecure attachment and both types of aggressive behavior (Marcus & Kramer, 2001).

Some research has linked child impulsivity with harsh parenting and poor parental management of negative emotions (Melnick & Hinshaw, 2000), and so it makes sense that these factors would be a starting point for considering possible etiological factors of impulsive, or reactive, aggression. In a study examining the parental correlates of impulsivity and aggression, Straus and Mouradian (1998) found that, in Caucasian families, increased use of corporal punishment by mothers was associated with increased rates of antisocial behavior and impulsive behavior in their children. These relationships held even when other variables often associated with child behavior were controlled for, such as age, sex, SES, level of nurturance and use of non-corporal punishment interventions used by the mother (Straus & Mouradian, 1998). In addition to corporal punishment, the authors examined the extent to which the punishment was administered impulsively by the parent. When corporal punishment was administered by the parent in an impulsive way, the relationship between parent and child behavior was even stronger. The authors speculate that the mechanism by which impulsive punishment could lead to impulsive and antisocial behavior is the modeling of such impulsive and aggressive behavior. Evidence exists which suggests that mothers and their children respond to each other with similar types of behavior during discipline episodes (Ritchie, 1999; Skuban et al., 2006). While this study is useful in pointing out a specific parenting strategy that is linked with both impulsivity and aggression, these are still two separate constructs. It would be helpful for future research to determine antecedents of impulsive-aggressive (reactive) behavior. More research is needed, then, on the antecedents of proactive and

reactive aggression, particularly in the domain of parent-child relationships such as attachment and discipline.

Inter-parental violence and aggression. Another link between parental characteristics and childhood aggression is the child's exposure to inter-parental violence. Parents who are violent toward one another model the use of aggression to solve problems, may have their own difficulties with anger and emotional regulation, and have children with more regulatory difficulties and aggressive behavior (Holden & Ritchie, 1991). Children's distance from the violence, as well as their own emotional regulation, appear to mitigate the effects of such exposure. Using data from a national survey of families identified by child abuse and neglect investigations, Hazen and colleagues (2006) found that inter-parental violence was linked to externalizing and internalizing behavior problems, even when controlling for risk factors such as SES, child maltreatment, and parent antisocial behavior.

A variety of mechanisms have been proposed to explain the relationship between domestic violence and children's aggression, including children mimicking the behavior of their parents, changes in parenting as a result of the stress associated with domestic violence, and children using their own behavior to redirect their parents' attention from inter-parental hostility (Easterbrooks & Emde, 1988). For example, children could learn the use of aggressive behavior by observing their parents' conflict resolution techniques, consistent with social learning theory. Or, parents who engage in domestic violence might also be more likely to be violent with their own children, which has also been associated with higher levels of child

aggression. They might also be more likely to be highly stressed, and less likely to use consistent discipline and supervision of their children. It has also been proposed that children unwittingly engage in more problematic behavior in highly stressed marriages in an effort to redirect attention from their parents' conflict. No currently published research has yet examined the type of aggression demonstrated by the children of physically aggressive couples.

A New Theory of Proactive and Reactive Aggression: Keenan and Shaw (2003)

Building on the work of Dodge and colleagues, Keenan and Shaw (2003) have developed a theory outlining the early causes of proactive and reactive aggression starting in the prenatal environment. From the transactional perspective, this theory elegantly combines issues of parenting practices and children's self-regulatory capacity in revealing the pathway to aggressive behavior. According to their model, early emerging biologically based emotional and behavioral underarousal or overarousal are at the root of psychopathology, including disruptive behavior disorders. Their model posits that these early differences in arousal, combined with a caregiving environment that exacerbates deficits in regulatory abilities, lead to risk for future antisocial behavior. They view differences in childhood aggressive behavior as the result of differences in infant level of arousal and concomitant ineffective caregiving. Studies have linked both extremes of under- and over-arousal with the development of aggressive behavior, supporting the 2-pathway model (Hay, 2005). According to Keenan and Shaw's model, proactive aggression results when an underaroused infant is paired with a parent who tends to understimulate and withdraw

from their child. The pathway to reactive aggression, on the other hand, is the result of an overaroused infant paired with a parent who tends to be overly responsive to the behavioral and emotional difficulties of their child. Further elaboration of both pathways is continued below.

The pathway to reactive aggression begins with an irritable infant who has difficulty with self-soothing and regulating emotions. When paired with a parent who has difficulty reading their cues and tends to overstimulate them in an effort to try to prevent the problem, these infants never have the valuable opportunities to experience and manage their negative emotions. As toddlers, these children display a low tolerance for frustration, and tend to be overactive and demanding. If parents continue to overcompensate for the child's lack of self-regulatory competence and place few demands on the child, they could become reactively aggressive and impulsive, and also display negative emotion easily and often. There is data to support the assertion that mothers of frustrated infants are more intrusive with those infants (Calkins, Hungerford, & Dedmon, 2004). Keenan and Shaw's model, outlined below, includes caregiver and child effects during infancy and toddlerhood.

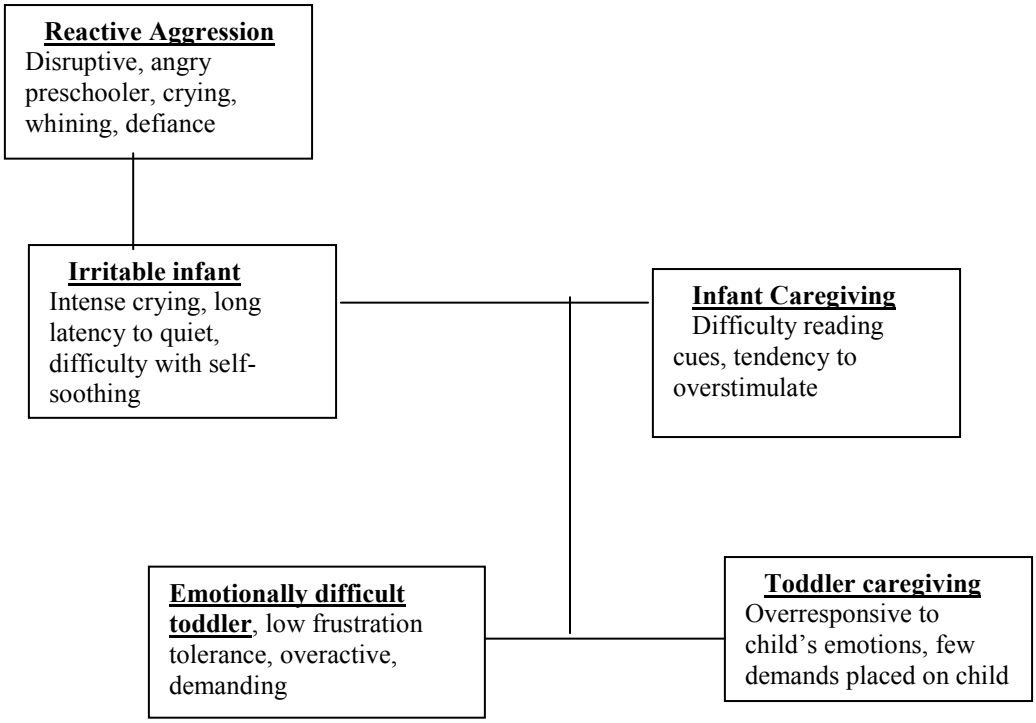

Figure 1: Pathway to Reactive Aggression

In contrast, the pathway to proactive aggression begins with an underaroused infant who the caregiver views, perhaps erroneously, as unresponsive or self-sufficient. This misreading of the infant's cues causes the caregiver to withdraw from the dyad such that the high level of stimulation needed by the infant is not provided. As toddlers, these children set out to explore their environment to get the stimulation they crave and become unresponsive to punishment. Their parents by now have become less engaged with a child they view as nonresponsive or independent, and may be inconsistent in their discipline. This pathway is thought to result in the proactively aggressive

preschooler, who deliberately and willfully violates rules, hurts others, and defies authorities.

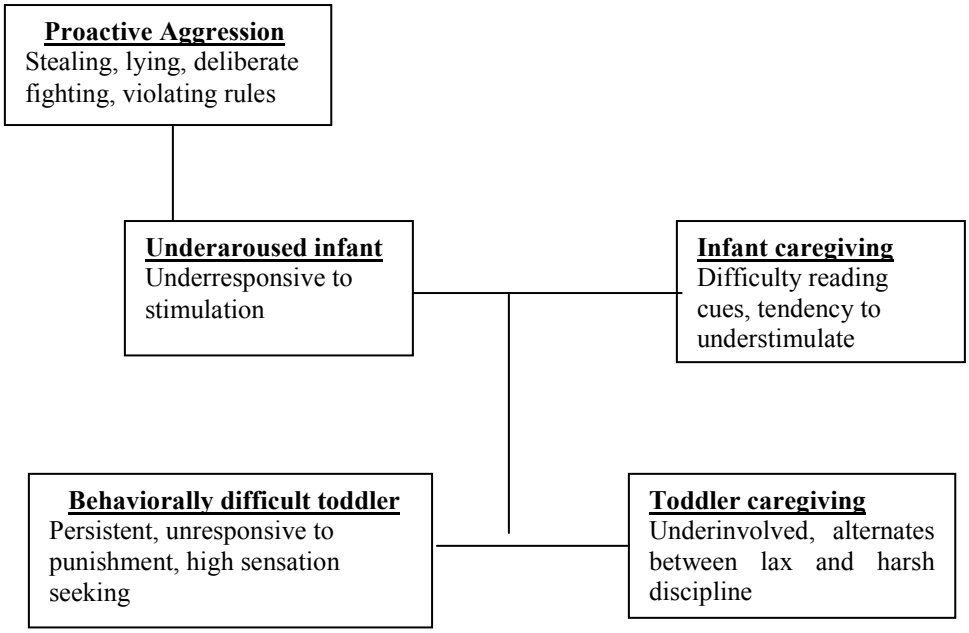

Figure 2: Pathway to Proactive Aggression

Keenan and Shaw's theory (2003) also addresses gender differences at each age and for both types of aggressive pathways. Citing evidence that the developmental trajectory for girls' aggressive behavior shows more improvement upon school entry and throughout childhood, these theorists propose that parents are more likely to socialize girls in ways that extinguish noncompliance and aggression. Since they view girls' antisocial behavior as less likely to persist over time, they hypothesize that the link between arousal level in infancy and later aggression will be weaker in girls than

in boys. The reactive pathway is proposed to be more frequently followed by girls because of evidence that their antisocial behavior tends to be accompanied by negative emotion and internalizing behavior, as on the overaroused pathway. In addition, they cite evidence that parents are successful in their greater attempts to socialize girls away from the types of behaviors characteristic of the proactive pathway (sensation seeking, persistence, nonresponsiveness to punishment). For these reasons, in addition to biological theories reviewed elsewhere (Paus, 2005; vanGoozen, 2005), it is predicted that girls will more often display reactive and pervasive aggression.

Keenan and Shaw's (2003) theory draws from the work of Dodge (1991) and outlines a testable causal theory of reactive and proactive aggression, and overlaps with previously offered hypotheses. As stated by Eisenberg, (2001) it is important to understand the relationships between emotionality, self-regulation, and different types of aggressive behavior (Eisenberg et al., 2001), specifically proactive and reactive aggression. Thus the hypotheses offered here concerning antecedents of proactive and reactive aggression should be tested so that a greater understanding of how self-regulation and parenting interact in the etiology of such behavior can be reached. One drawback of this theory, however, is that no explanation is given of the large group of children found to display both types of aggression, labeled pervasive aggressive. Since children are not born with both high levels of underarousal and overarousal, it seems that this theory cannot be interpreted as consistent with the data on aggressive children. However, in the previously stated hypotheses on the development of pervasive aggressive behavior, pervasive aggressive behavior was

conceptualized as a reactively aggressive child who has learned the use of proactive aggression through the social learning mechanism proposed as the dominant antecedent of such behavior. In this way, proactive aggression is viewed as more environmentally linked while reactive and pervasive aggression are more biologically linked and depend more on the interaction between parent and child. Interestingly, in a longitudinal study of behavioral under and overcontrol, Valiente and colleagues (2003) found that by middle childhood the two constructs were highly correlated, and that as children develop more effortful control their behavior problems appeared less reactive.

Child and Parent Correlates of Aggression Subtypes: Summary

Taking into account the review of the literature and the hypotheses set forth by Keenan and Shaw (2003), it is hypothesized here that reactive aggression is driven mostly by biological characteristics, evidenced by impulsivity and deficits in self-regulation, which are present as temperamental overarousal at birth. Children who are reactively aggressive have difficulties that are exacerbated by negative interactions with parents and the environment; interactions that are often driven by their temperamental reactivity. As cognitive processes develop, many reactively aggressive children learn how to use aggression proactively, often when exposed to aggressive role models such as parents or peers. It is possible that observing the aggression or receiving the impulsive discipline of their parents facilitates the learning of proactive aggression. If reactive aggressive behavior is already present, then these children would be categorized as pervasive aggressive. It is through such learning mechanisms

that children develop proactively aggressive behavior, whether or not in the presence of reactive aggression.

According to the current hypotheses, proactively aggressive children are born underaroused by stimuli, and their parents misinterpret this cue and disengage from them. As the children mature, parents alternate between permissiveness and harsh discipline. Consistent with social learning theory, parents of proactively aggressive children will be likely to endorse the use of violence either as a way to resolve disputes or as a means of achieving goals. They might teach their children the use of aggression in self-defense, or they might model bullying behavior to their child during daily interactions with others. They might also bully their spouse or children, and would be likely to be antisocial or violent themselves. Such parents would be likely to have psychopathology such as Antisocial Personality Disorder, and to have arrest or prison records or a history of domestic violence. As is often the case in such families, poverty can influence child outcomes through lack of access to health care, lack of access to good child care, dangerous neighborhoods, and lack of parental monitoring, and these issues play a role in the closing off of opportunities for changing negative behavior. Children who are proactively aggressive are not hypothesized to display any of the deficits associated with reactive aggression, such as impulsivity and low IQ. It is hypothesized that, consistent with underarousal that is present at birth, these children will be less responsive to punishment and seek stimulation to compensate for their low arousal threshold. In addition to these needs, these children have also learned

from their environments how to behave aggressively, and their behavior emerges later and tends to follow the developmental trends of aggressive behavior.

Children who are reactively aggressive, on the other hand, have an earlier onset of behavior and characteristics that implicate the interaction of temperamental reactivity with parental maltreatment in the development of their aggressive behavior. Heightened physiological reactions to frustration and problems regulating emotions, combined with high rates of behavioral impulsivity, make it difficult for these children to think through the consequences of their aggressive behavior. These characteristics also make parenting such a child a unique challenge, and a negative parent-child interaction can exacerbate the problem. In families where the interaction is extremely negative, or if the parents have many of the same characteristics as the parents of proactively aggressive children or reinforce aggression, a reactive child may also learn the use of proactive aggression, and thus would be categorized as pervasively aggressive. A great number of parent-child interactions for this group will be marked by negativity, lack of warmth, and physical violence. Over time, it may be difficult to distinguish these parents from the parents of other aggressive groups because they may also be engaging in parenting behaviors that are a reaction to (but in turn, reinforce) the behaviors of their child they are trying to reduce. Parents of reactively aggressive children who are extreme in their physical violence, model antisocial behavior to their children, or use impulsive discipline will be the most likely to have their reactively aggressive child become pervasively aggressive during late childhood or early adolescence.

The Current Study

The purpose of this study is to further examine the construct of aggression with regard to reactive and proactive aggression. More specifically, of interest is the degree to which different categories of aggression are associated with different child and parent variables. Identifying the correlates of proactive and reactive aggression could help us better understand the etiologies and sequelae of these subtypes. While many parent and child characteristics have been associated with aggression as a general construct, this study will focus specifically on the potential child correlates of gender and self-regulation and the potential parent contribution of discipline practices and interparental violence. While testing the entirety of Keenan and Shaw's (2003) theory is beyond the scope of this study, a subset of parent and child correlates of proactive and reactive aggression in early and middle childhood will be examined in order to provide some initial support for their model in an ethnically diverse sample of preschoolers demonstrating clinical levels of aggression.

Thus, consistent with Keenan and Shaw's conceptualization, the following hypotheses are offered:

1. It is predicted that reactive aggression, and not proactive aggression, in early childhood will be associated with emotional and behavioral overarousal in infancy, as evidenced by early deficits in self-regulation and increased negative emotionality in early childhood.

2. As proactive aggression is thought to develop through the mechanism of social learning, and particularly exposure to aggressive role models, proactive aggression in early childhood will be more strongly associated with parental aggression and reinforcement for aggressive behavior than reactive aggression. This parental aggression is thought to be manifested as inter-parental violence and hostility. Reactive aggression, as has been found in previous studies (i.e., Connor et al., 1994) is hypothesized to be associated with child maltreatment and harsh physical discipline.
3. As predicted by Keenan and Shaw (2003) and Dodge (1990), more children will demonstrate reactive aggression than proactive aggression and more boys than girls will be categorized as aggressive. However, Keenan and Shaw (2003) also predict that girls will demonstrate proportionally more reactive aggressive than boys.

CHAPTER II

METHOD

Participants

The participants for the current study (n = 75) were recruited from daycare centers and Head Start centers as well as other nonprofit agencies providing services for preschoolers in Guilford County. Parents of children ages 3 through 5 who gave consent were asked to complete the Behavior Assessment System for Children, Second Edition (BASC II 2 -5). Nearly 600 children were screened in two screening efforts (n = 578). Children whose T-score on the aggression subscale on the BASC exceeded 65 were selected as participants, and families were asked to complete the full assessment packet. The 2004-2005 screening yielded 53 eligible participants. Additional qualified participants were recruited from a second screening and from other agencies, with a total of 117 families contacted. Of those, 75 agreed to participate. No differences were noted in aggression levels based on BASC T-score or the age of the child for responders versus non-responders.

Once informed consent was obtained, measures of child behavior and child self-regulation were collected from parents of the selected participants. Parents provided information on parenting strategies and levels of inter-parental violence in the home. Teachers of the 75 identified participants were also invited to provide ratings on the child's aggression and self-regulation, with 32 teachers providing those ratings.

Child Measures

Aggression. Aggressive behavior was measured in all participants using the Behavior Assessment System for Children Second Edition (BASC-2) parent report for preschool children (Reynolds & Kamphaus, 2004). Parents rated the child's behavior on 4-point scale (never, sometimes, often, almost always) for 109 child behavior items. The BASC subscales include among others Aggression, Anxiety, and Hyperactivity. The BASC is a psychometrically sound, well-validated instrument standardized in large national clinical and community samples. High internal consistency exists for both the subscales and the composite scores, and construct validity T-scores on the aggression subscale were used as the outcome variable. This scale measures both physical and verbal aggression, and includes such items as "Talks back to teachers/parents" and "Threatens to hurt others". Children whose parents rated their aggressive behavior as clinically elevated (T-score > 65) were selected for further participation in the study.

Subtypes of aggression. In order to measure proactive and reactive aggression, the items of the original Coie and Dodge (1987) measure were administered to both parents and teachers. These six items are scored on a Likert scale from 0 (never) to 3 (often). Total scores were derived for each aggressive type by summing responses across the three items for each type.

Emotion regulation. Children's ability to regulate emotions and self-soothe distress was measured by the Emotion Regulation Checklist (ERC), a 24-item parent report measure (Shields & Cicchetti, 1997). Raters chose answers on a 4-point Likert

scale (1=almost always, 4=never) to what extent each statement is characteristic of the child. Two factor scores were derived: Lability/Negativity and Emotion Regulation. Both scores were used in testing the first hypothesis: Lability/Negativity scores served as indicators of negative emotionality and the Emotion Regulation score is an indication of the level of emotion regulation of participants. Both parents and teachers rated children's emotion regulation using this measure.

Caregiver Measures

Parenting strategies. Parents rated their own parenting behavior and strategies using the Alabama Parenting Questionnaire (Frick, 1991). The APQ is a 42-item self-report measure that asks parents to rate, on a scale of 1 (never) to 5 (always) how often they engage in each parenting strategy. Five scale scores are derived from the APQ, including parental Involvement, Positive Parenting, Poor Monitoring/Supervision, Inconsistent Discipline, and Corporal Punishment. Inconsistency of discipline and harshness of corporal punishment were measured using scores derived from this scale.

Parental violence. To provide a measure of more serious parental violence, the Parent-Child Conflict Tactics Scale (Straus, Hamby, Finkelhor, & Runyan, 1998) was used. This measure presents the parent with 22 items and asks them to rate how often they have engaged in each behavior with their child, ranging from once in the past year to more than 20 times in the past year. Items assess the domains of Non-violent Discipline, Psychological Aggression, and Physical Assault ranging from minor to severe assault. Examples of items include “slapped him/her on the hand, arm, or leg”. The Physical Assault score was used as a measure of parental violence.

Interparental violence. To investigate the hostility and aggression between parents in the home, the revised Conflict Tactics Scale (Straus, Hamby, Boney-McCoy, & Sugarman, 1996) was used. This measure rates the extent to which parents have engaged in reasoning, psychological aggression, and minor and severe assault to manage conflict with their spouse or others in the home besides the children (i.e., a partner or the child's grandparent). Domain scores were derived for each of the above strategies by summing the responses across scales. A total score for Physical Assault (minor and severe assault) was used as the measure of inter-parental violence.

Parenting strategies. The Coping with Children's Negative Emotion Scale (CCNES, Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002) was completed by parents to report their typical response style to the display of emotions by their child. The measure consists of twelve vignettes describing events which evoke negative emotions in young children, and parents were asked to rate on a 7-point Likert scale (1= very unlikely, 7= very likely) the likelihood that they would respond in one of six ways. For each vignette, parents rate the likelihood of response for three possible negative responses and three possible positive responses, and the measure yields a composite score for supportive and nonsupportive responses. Positive responses include a) emotion-focused responses (e.g., "comfort my child to make him feel better"); b) problem-focused responses (e.g., "help my child figure out how to get his bike fixed"); and c) expressive encouragement (e.g., "encourage my child to talk about his angry feelings"). The three negative response styles were a) punitive responses (e.g., "tell my child that if he starts crying he'll have to go to his room right away"); b)

minimizing responses (e.g., “tell my child that he is overreacting”); and c) parental distress reactions (e.g., feel upset and uncomfortable because of my child’s reaction”). The punitive responses scale was used as a measure of parents’ tendency to respond punitively to their child’s emotional displays. This measure has been demonstrated to have good construct and external validity, and correlates with various measures of children’s social and emotional functioning and measures of parental socialization practices (Eisenberg & Fabes, 1994; Eisenberg, Fabes, & Murphy, 1996).

CHAPTER III

RESULTS

Participant Demographics

Demographic information for the sample (n= 75) are included in Table 1. Males (n= 52) outnumbered females (n= 23), which is consistent with gender differences found in the aggression literature. Information was gathered on mother's marital status, age, and education attained. Mean maternal age was 32 years (sd = 8), and mean child age was 3.9 years (sd = .61). Most mothers were high school graduates (39%) or had attended some college (39%). Despite efforts to collect data from a variety of racial and socioeconomic backgrounds, the majority of the sample was African American and in poverty. In terms of racial/ethnic background, most participants were African American (73%), with 23% of the sample Caucasian and 3% Hispanic. These demographics differ from Guilford County, which is 64% Caucasian and 30% African American. Most children live with single mothers (47%) with 26% living with mothers who are married. Twelve percent of the sample identified themselves as living with a partner, 13% as divorced or separated, and 1% as widowed. In terms of monthly income, 28% of the sample reported a monthly income under $500. Twenty-one percent reported an income between $500 and $999, and 20% of families made between $1000 and $1499 monthly. A full 85% of the sample reported a monthly income less than $2000.

Missing Data

Because of missing data with respect to teacher ratings and ratings of interparental violence, independent samples T-tests were conducted to determine if there were any demographic differences among those with or without those data. With respect to teacher BASC-2 ratings, no significant differences were detected between the groups in terms of gender, race, socioeconomic status, or mother's marital status. T-tests were also conducted to determine if any differences between participants with and without measures of interparental violence. Again, no significant differences were detected.

Descriptive Statistics and Correlation of Measures

Means and standard deviations of parent and child measures are included in Table 2. Cronbach's alpha was calculated for each measure, and ranged from .48 to .89. All measures were normally distributed, with the exception of the violence measures (CTS and PC-CTS).Both measures were positively skewed, with a large number of respondents scoring 0. More information on variable distribution and internal consistency can also be found in Table 2.

Consistent with the selection criteria, (general aggressive behavior as rated by the BASC) parents and teachers indicated significant levels of aggression, with parents and teachers rating similar levels of proactive and reactive aggression (PA and RA) in this sample. As predicted, both teachers and parents indicated higher levels of reactive than proactive aggression. Only one boy was rated as purely proactive aggressive, and more boys than girls were rated as reactively and pervasively aggressive (see Table 3

for aggression group by gender). A group of 10 participants were classified as "no group" due to PA and RA scores of 0. An independent samples T-test was conducted to determine if any differences existed between this group and those who scored at least 1 on the Proactive and Reactive Aggression Scale. This group differed from the others only in terms of gender; the "no group" was predominantly female.

Child Correlates of Aggression Subtypes

Age. Although the age range of the participants was fairly narrow, developmental literature highlights that aggression, lability/negativity and emotion dysregulation all tend to improve as the child gets older. To determine if there were any such age differences, correlations between gender and the child correlates of interest were examined. Age of the child was not significantly correlated with any of the other measured variables.

Reactive aggression. For the first hypothesis, significant negative correlations were expected between reactive aggression and emotion regulation, with lower levels of emotion regulation (as measured by the ERC) associated with higher levels of reactive aggression. Reactive aggression was also hypothesized to be associated with higher levels of negative emotionality, as measured by the Lability/Negativity score of the ERC. In contrast, nonsignificant correlations were expected between proactive aggression and emotion regulation and lability/negativity. This hypothesis was only partially supported. Reactive aggression was significantly and positively associated with lability/negativity ($r = .40$, $p < .01$) such that higher levels of reactive aggression

were associated with higher levels of lability and negativity. However, reactive aggression was not significantly associated with parent ratings of emotion regulation ($r = -.20$, ns), although the association was in the expected direction (e.g., higher levels of reactive aggression associated with less emotion regulation). In contrast, teacher ratings of reactive aggression were significantly and negatively associated with emotion regulation ($r = -.42$, $p<.05$).

Given the literature highlighting potential gender differences in the expression of aggression, separate correlations were calculated for boys and girls. As predicted, reactive aggression was significantly and negatively related to emotion regulation as rated by parents ($r = -.28$, $p < .05$) and by teachers ($r = -.50$, $P < .05$). In contrast, the correlations between reactive aggression and emotion regulation were nonsignificant for girls ($r = -.02$, ns), although this could have been due to the small number of girls in the study.

Proactive aggression. It was predicted that there were not be a significant relationship between proactive aggression and the child variables of emotion regulation and lability/negativity. As predicted, proactive aggression was not significantly related to emotion regulation ($r=-.16$, ns). In contrast, proactive aggression scores were significantly and positively related to lability/negativity in the overall sample for parents ($r = .36$, $p<.01$).and teachers ($r = .36$, $p< .01$). As with reactive aggression, separate correlations were run for boys and girls. Proactive aggression was not significantly associated with emotion regulation for boys ($r = -.17$, ns) or girls ($r = -.07$, ns). Contrary to the hypothesis, it was significantly and positively

correlated with lability/negativity for boys for parent ratings (r=.34, p. <.05) and teacher ratings (r = -.02, ns). For girls, proactive aggression was not related to either lability/negativity in parent (r = .36, ns) or teacher ratings (r = -.27, ns).

Parental Correlates of Aggression Subtypes

Reactive aggression. It was hypothesized that reactive aggression would be significantly and positively correlated with harsh/punitive parental discipline. Consistent with predictions, harsh corporal punishment was significantly and positively associated with levels of reactive aggression as rated by both parents (r = .41, p<.01) and teachers (r = .36, p<.05). Reactive aggression as rated by both parents and teachers was also associated with inter-parental violence (r = .26, p<.05 parent; r = .36, p<.05 teacher). Children rated by teachers as reactively aggressive had higher levels of parent rated harsh discipline (r = .38, p<.05).

Proactive aggression. A significant positive correlation was expected between proactive aggression and the parental variables of harsh discipline and inter-parental violence, such that harsher discipline and more hostility and overt aggression between parents would be associated with higher levels of proactive aggression. Again, the hypothesis was only partially supported. In the overall sample, parent rated proactive aggression was associated with harsh physical discipline (r = .38, p<.01) but not inter-parental violence (r = .21, ns).

Gender and Aggression Subtypes

The third set of hypotheses related to gender differences in proactive and reactive aggression. As expected, more children were classified as reactive than proactive aggressive (see Table 3) and consistent with the literature, more boys were identified than girls as having clinical levels of aggression. With regard to subtypes of aggression, it was hypothesized that girls would be proportionally more reactively aggressive than boys. This was tested by a paired samples t-test comparing means of boys' and girls' proactive and reactive aggression. The means are as follows: boys had a higher mean level of proactive aggression (m = 1.8) than girls (m = 1.3) and also had higher mean reactive aggression scores (m = 3.3) than girls (m = 2.7). These differences were not significant, however: proactive aggression ($t = .99$, $p>.05$) and reactive aggression ($t = 1.05$, $p>.05$).

Each case was categorized as proactive, reactive, or pervasive aggressive in the following way (from Connor et al., 2004). If the child had a score of zero on both scales, they were labeled "no group" (n = 10). If they scored higher than the mean on both types of aggression, they were labeled pervasive aggressive (n = 19). For the remaining cases, the higher score, proactive or reactive, determined their group status, with significantly more reactively aggressive children (n = 45) than proactively aggressive children (n = 1). See Table 3 for group membership by gender. A Complex Chi-square was calculated for group membership by gender and was significant (Complex chi-square = 8.71, $p<.05$), reflecting the small numbers of participants categorized as proactively aggressive. As predicted, girls were more likely to be

reactive than proactive aggressive, although gender was not a significant predictor of aggression subtype.[1] To further investigate gender differences in aggression, correlations were run separately for boys and girls (see Tables 6 and 7). Given the small number of girls in the overall sample as well as number of girls who were proactively aggressive, the significance of these correlations and magnitude of differences between boys and girls should be interpreted with caution. Further analyses comparing the magnitude of correlations in boys versus girls were not undertaken due to lack of power.

Reactive aggression. For boys, reactive aggression was significantly correlated with higher levels of lability/negativity ($r = .45$, $p < .01$) and less emotion regulation as rated by parents ($r = -.28$, $p < .05$) and teachers ($r = -.50$, $p < .05$). In terms of parent variables, reactive aggression was significantly and positively correlated with higher levels of inconsistent discipline ($r = .32$, $p < .05$), greater use of corporal punishment ($r = .45$, $p < .01$), more punitive parenting strategies ($r = .40$, $p < .01$), harsher physical discipline ($r = .46$, $p < .01$), and higher levels of inter-parental violence ($r = .36$, $p < .05$). Among girls, reactive aggression was significantly and positively correlated with harsh physical discipline but no other parent or child variables ($r= .48$, $p < .05$).

Proactive Aggression. For boys, proactive aggression was significantly and positively correlated with higher levels of lability/negativity ($r = .34$, $p < .05$). In terms of parent variables, it was also significantly and positively correlated with greater use of corporal punishment ($r = .46$, $p < .01$), more punitive parenting ($r = .32$, $p< .05$), harsher physical discipline ($r = .38$, $p< .01$), and greater inter-parental violence ($r =$

.32, P < .05), a pattern very similar to reactive aggression. Thus, for boys, reactive aggression was uniquely associated with inconsistent parenting and poor emotion regulation as rated by both parents and teachers. In contrast, for girls, the only significant correlation among proactive and other child and parent variables was a significant and positive correlation with harsh physical discipline ($r = .50$, $p < .05$). Again, this may be due to the overall smaller number of girls who were participants and the lower scores of proactive aggression among girls.

Overlap of Proactive and Reactive Aggression

One notable aspect of the data that has implications for the analyses is the high degree of correlation between proactive and reactive aggression in this sample in both parent ($r = .82$, $p < .01$) and teacher ($r = .85$, $p < .01$) ratings. While a high degree of overlap has been noted in other studies, this correlation is particularly high- to the point where we may not be measuring independent entities. As mentioned previously, the two can be highly correlated and still be useful to the point that theoretically consistent predictions can be made based on correlates of each subtype. However, in this sample, proactive and reactive aggression have similar parent and child correlates, without the differential pattern of correlates found in the literature. Thus, the subtypes of proactive and reactive aggression are presented here with caution.

Prediction of Aggression Subtypes

Next, the variables that correlated significantly with proactive and reactive aggression scores were included in the regression analysis. Before conducting regression analysis, the assumptions for regression analysis were examined. Each

dependent variable was shown to have a linear relationship with the others and to fall into a roughly normal distribution. No outliers were noted. The 10 cases in which participants were rated 0 on both proactive and reactive aggression were eliminated from the analyses. Power analyses indicated that, with four predictors, detecting a medium effect size would require 84 cases and detecting a large effect size would require 38 cases. Thus it was determined that 65 cases would be sufficient to conduct the analyses, although the power might be limited to detect a smaller effect size. Once it was established that no violations of the assumptions were present and there was moderately sufficient power to conduct the analyses, three multiple linear regressions were conducted. Proactive aggression, reactive aggression, and an interaction term PA x RA to approximate pervasive aggression each functioned as the dependent variable. Before creating the interaction term, PA and RA were standardized into z-scores in order to center the variable. For the regression predicting proactive aggression, the predictors entered were corporal punishment, lability/negativity, and child gender. For the regression predicting reactive aggression, the predictors entered were corporal punishment, lability/negativity, inter-parental violence, and maternal age. The preceding four variables were also entered as predictors in the regression analysis predicting the interaction between proactive and reactive aggression.

For the first regression model predicting proactive aggression, child gender was entered in the first block, followed by corporal punishment and lability/negativity. The overall model was a poor fit (adjusted R-square = -.02) but the overall relationship was significant ($F_{3, 60} = 7.43$, $p<.01$). Gender did not predict proactive aggression (t =

.51, ns), but corporal punishment (t = 3.6, p<.01) and lability/negativity (t = 3.1, p<.01) were significant predictors of proactive aggression. See Table 9 for full model results.

For the second regression predicting reactive aggression, maternal age was entered in the first step. In the next step, the child variable lability/negativity was entered, followed by a block of parent variables (corporal punishment and inter-parental violence). The overall model was again a poor fit (adjusted R-square = .19) but the overall relationship was significant ($F_{4, 49} = 4.2$, p<.01). Maternal age (t = .17, ns) and inter-parental violence (t = .65, ns) were not significant predictors of reactive aggression. Again, corporal punishment (t = 2.48, p < .01) and lability/negativity significantly predicted levels of reactive aggression (t = 2.74, p<.01).

The third regression model predicting the interaction of proactive and reactive aggression, or pervasive aggression, included the same four variables as entered above: maternal age followed by child lability/negativity, then a block of parent variables (corporal punishment, inter-parental violence). As with the previous two models, the overall model fit was poor (adjusted R-square = .07). However, the overall relationships between variables were not significant ($F_{4, 49} = 1.93$, p>.05). Inter-parental violence (t = .34, ns) maternal age (t = .60, ns), and child lability/negativity (t = 1.13, p > .05) were not significant predictors of pervasive aggression, but corporal punishment (t = 2.12, p<.05) was a significant predictors of levels of pervasive aggression. Thus the overall results of the regression analysis are as follows: levels of proactive and reactive aggression were predicted by corporal punishment and

lability/negativity. While corporal punishment was a significant predictor of pervasive aggression, the overall model was not significant. Unfortunately, no set of variables uniquely predicted levels of the subtypes of aggression.

CHAPTER IV

DISCUSSION

The purpose of this study was to examine child and parent correlates of proactive and reactive aggression in an early childhood sample and to test parts of Keenan and Shaw's (2003) theory regarding the developmental trajectories of proactive and reactive aggression. Hypotheses regarding the associations among child gender, emotionality and regulation skills, parenting and inter-parental violence were partially supported, although significant limitations of the study prevent us from drawing firm conclusions regarding these hypotheses. Other unanticipated but notable findings will be discussed, as well as clinical implications and future directions for research.

According to Keenan and Shaw (2003), it is the miscommunication between an overaroused and emotional child and an overinvolved parent that leads to deficits in self-regulatory competence and, ultimately, to reactive aggression. The first hypothesis, that reactive and not proactive aggression would be associated with deficits in self-regulation and increased negative emotionality was partially supported. While reactive aggression was found to be associated with negative emotionality and self-regulation deficits, these associations were not unique to reactive aggression. Proactive aggression was also associated with negative emotionality. However, the hypothesis that reactive aggression would be uniquely associated with deficits in

emotion regulation was supported when examining teacher ratings of emotion regulation. Also, unique associations between reactive aggression and poor emotion regulation were found in boys, but not in girls. More discussion of tentative findings for boys and girls continues below. Thus, in this test of hypotheses related to emotionality and self-regulatory capacity of proactive and reactive aggressive preschoolers, we did find evidence to support the assertion that self-regulation deficits are specific to reactively aggressive children, particularly boys, supporting the hypothesis and Keenan and Shaw's theory.

Both aggressive groups appeared to have difficulties with negative emotionality. This could be attributed to the developmental level of our sample. As preschoolers age, they develop more internal controls of their emotional expression. It could be that children who will become more proactively aggressive will develop such controls, while the children who become more reactively aggressive will not. Again, this could be related to the age range studied and that at a later developmental stage more differences in emotional functioning will be present. Keenan and Shaw propose that proactive children will have low levels of fear, but high levels of oppositionality and defiance (2003). Perhaps our measure of negative emotionality was not precise enough to determine specific differences in the negative emotionality of the groups. Future research should examine more specific negative emotions (i.e., fear versus anger) in proactive and reactive aggression

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Consistent with the work of Dodge (Dodge, 1991; Dodge et al., 1997), we hypothesized that proactive aggression would be associated with inter-parental violence and reactive aggression would be associated with harsh physical discipline. This hypothesis was also partially supported. Reactive aggression was associated with harsh physical discipline, but so was proactive aggression. In fact, both types of aggression were significantly correlated with both corporal punishment and harsh physical discipline, and corporal punishment was a significant predictor in the regression analysis for proactive, reactive, and pervasive aggression. Thus, harsh physical discipline was not uniquely associated with reactive aggression as was expected. In addition, it was reactive aggression, not proactive aggression, which was correlated with inter-parental violence. However, inter-parental violence was not a significant predictor of proactive or pervasive aggression in the regression analysis.

Therefore, in the overall sample it was reactive and not proactive aggression that was found to be associated with inter-parental violence, with both parent and teacher rated reactive aggression associated with higher levels of parent rated domestic violence. Both types of aggression were related to harsh parental discipline when rated by parents. See Table 8 for expected and actual correlates of proactive and reactive aggression in the overall sample. When looking at only the boys in the sample, both types of aggression are significantly correlated with inter-parental violence, the use of punitive parenting strategies, corporal punishment, and harsh physical discipline.

Correlational analysis revealed that, in the overall sample, proactive aggression was not associated with inter-parental violence as predicted. However, when looking at correlations for boys, inter-parental violence was correlated with both types of aggression. Reactive aggression was correlated with all of the expected variables (corporal punishment, harsh physical discipline, low self-regulation, and high lability/negativity). However, the relationships among these variables were not specific to reactive aggression; in fact, proactive aggression was correlated with many of the same variables, which could possibly reflect the high degree of overlap between PA and RA in this sample. The only variables that were correlated uniquely with reactive aggression were teacher rated low self-regulation, younger maternal age, and inconsistent discipline. In boys, reactive aggression was correlated uniquely with inconsistent discipline ($r = .32$, $p < .05$) and low emotion regulation as rated by parents ($r = -.28$, $p < .05$) and teachers ($r = -.50$, $p < .05$). No unique correlations were found for PA or RA in girls. Contrary to predictions, exposure to inter-parental violence was related to reactive and not proactive aggression in the overall sample, but was related to both types of aggression in boys.

Past studies have found that proactive aggression is more related to children's exposure to domestic violence while reactive aggression is correlated with a history of physical abuse. Our findings, somewhat contrary to these, were that both types of aggression are related to harsh physical discipline. While it could be argued that parents who are aggressive towards their children are more likely to be aggressive toward one another, in our sample the two were not significantly correlated. Our

results could reflect the clinically significant level of aggression of our sample; Dodge et al. (1997) found that for psychiatric samples both aggressive groups had experienced high levels of early trauma and family problems. Additionally, in this sample it was reactive and not proactive aggression that was related to inter-parental violence. It should be noted that the measure relied on parents' self-report of domestic violence and did not use other measures such as police reports or ask about the child's exposure to violent episodes. In addition, for parents who did not currently have a partner, they were asked to complete the ratings based on their last relationship. It is possible that parents could have high rated levels of inter-parental violence that the targeted child was ever aware of or exposed to. Also, both measures of violence (CTS, PC-CTS) were negatively skewed, with most raters reporting low or no violence. Outliers were noted in both measures. This could be a result of the stigma associated with reporting violence in the home, or a result of parent concern that such behavior would be reported to authorities. Consistent with IRB recommendations, parents were made aware in the consent form that reports of behavior consistent with child abuse would be reported to child protective services. Parents may have been hesitant to report violence if it was in fact ongoing in their home.

According to Keenan and Shaw (2003), aggressive preschool girls are more likely to follow the reactive pathway because their aggression tends to be associated with negative emotionality and their parents are more focused on socializing them away from behaviors associated with the proactive pathway, such as persistence and sensation seeking. Hypotheses concerning gender and aggression were partially

supported, although they are tentatively offered here due to issues with power and sample size. More males than females were rated as aggressive, and when participants were classified into aggressive subtypes, more children were classified as reactive than proactive. As hypothesized, aggressive girls were more often categorized as reactively aggressive. These findings support Keenan and Shaw's (2003) contention that girls are predisposed to more reactive types of aggression. More research is needed to examine the trajectories of aggressive girls and the extent to which parental socialization might account for differences in aggressive behavior by gender. In this study, the small number of girls that were aggressive may have limited the investigation of correlates with gender. Perhaps examination of other types of aggressive behavior, such as relational aggression, will further elucidate differences in the aggression of boys and girls. The research into girls' aggression focuses more frequently on the relational aggression of school age girls, and has lately begun to focus on the preschool antecedents of such behavior (Crick et al., 2006; Pelligrini & Roseth, 2006).

Relationships between aggressive subtypes and parent and child variables were examined separately for boys and girls, although the small number of participants requires us to examine these correlations with caution. Different patterns were noted in the correlations for boys and girls. For boys, proactive and reactive aggression were associated with a host of parent and child variables. However, for girls, proactive and reactive aggression were only associated with harsh physical discipline. Thus in boys, there were some unique relationships with reactive aggression and emotion regulation and inconsistent discipline that supported the hypothesis. As has been found in other

studies, maternal behavior is more salient to the behavior of boys than girls (Gottman & Fainsilber, 1989; Keenan & Shaw, 1997) and so it should be no surprise that these differences might also be found in an aggressive sample. For boys, then, it appears that the combination of punitive parenting, harsh corporal punishment, and inter-parental violence is associated with proactive aggression, whereas the combination of these variables with inconsistent parenting and poor emotion regulation on the part of the child leads to reactive aggression. For girls, however, only harsh physical discipline was related to their aggressive behavior, and no unique relationships were found for the subtypes. Again, these correlations are tentatively presented here due to the small number of girls. More research should focus on different parenting styles and strategies of aggressive boys and girls, specifically proactive and reactive groups.

Other findings that were not hypothesized include the relationship between reactive aggression and inconsistent parenting and maternal age. Higher levels of reactive aggression were associated with more inconsistent parenting and younger maternal age. This study is one of the first to link reactive but not proactive aggression with maternal age, and this relationship was only true of the boys in the sample. Younger mothers were less likely to be married or living with a partner and had lower incomes than older mothers. Other variables, such as number of children or amount of parenting experience could account for younger mothers rating their children as more reactively aggressive. Research has linked mother's age at first childbirth with poor outcomes for the identified child (Tremblay et al., 2005), but we measured current maternal age rather than age at first childbirth. Perhaps older mothers possess

parenting strategies and have access to supports (i.e., co-parents, financial support) that help them parent in more consistent ways that are related to lower levels of reactive aggression in their children. It is not surprising that this relationship between younger mothers and reactive aggression held only for boys, given the importance of maternal variables to boys behavior demonstrated here. Given the emphasis on parenting behaviors in Keenan and Shaw's theory (i.e., reading of infant cues, appropriate response, setting of limits) it would be important to understand what resources make it easier for mothers to communicate and interact with their infants and toddlers effectively.

Inter-parental violence was also related to inconsistent and punitive parenting. Parents who rated their relationships as higher in violence also rated themselves as more likely to use corporal punishment (but not harsh physical discipline). Teachers also recognized reactive but not proactive aggression in the children of these parents. Thus, parents who have been involved in domestic violence are less consistent in their discipline and more punitive in their responses to their children, who are also more reactively aggressive. These findings lend support to theories that view disrupted parenting as the link between domestic violence and child aggression. Perhaps parents who were stressed by the violence in their home found it more difficult to be consistent in their discipline, and were more punitive and physical with their children when they did intervene, as is consistent with the stress model proposed by Straus (1997).

This study is the first to find that reactive but not proactive aggression is related to inconsistent parenting. This makes sense given previous findings that parents of aggressive children are more likely to use lax or overreactive discipline (del Vecchio & O'Leary, 2006). This also fits with Keenan and Shaw's conceptualization of reactive aggression as a result of parenting that is not attuned to the needs of the child. They theorized that parents of these reactive children would avoid situations that would result in behavioral and emotional outbursts; often failing to set limits to avoid conflict. Perhaps this parenting behavior was measured here as inconsistency. Additionally, reactively aggressive children are conceptualized as having higher levels of impulsivity, which could also be true of their parents and contribute to the use of less stable and consistent parenting strategies.

In summary, the results of this study are somewhat consistent with the data on proactive and reactive aggression in early childhood, with the exception that proactive aggression was unexpectedly related to negative emotionality and it was reactive, but not proactive aggression that was related to inter-parental violence. Harsh physical discipline was related to both types of aggression. Unexpectedly, young maternal age and inconsistent discipline were related uniquely to reactive aggression. In terms of Keenan and Shaw's theory, many of their hypotheses were supported here. As predicted, aggressive preschool girls were more reactive than proactive. Though the correlations should be interpreted with caution due to the small sample size, different patterns of parent and child correlates were present for boys versus girls. This is also consistent with previous work by Keenan and Shaw (1997). Reactive aggression was

associated with parent characteristics that would make it difficult to read cues and interact in synchrony with an overaroused infant (i.e., young maternal age, inconsistent parenting, inter-parental violence). It was also associated with the predicted child characteristics, such as poor emotion regulation and negative emotionality, but not uniquely and not by both raters in the overall sample. However, for boys, reactive aggression was uniquely associated with poor emotion regulation as rated by both teachers and parents, and with inconsistent discipline. Proactive aggression was marked by parents' efforts at gaining control over a child they perhaps viewed as difficult to discipline by using physical and sometimes harsh means, although again this was not unique to proactive aggression. In terms of pervasive aggression, no correlates uniquely predicted pervasive aggression. Given the pattern of the correlations, it appears to be more related to the reactive than proactive subtype, which is consistent with other studies that have demonstrated an overlap in the correlates of reactive and pervasive aggression and theories that view pervasive aggression as a form of reactive aggression. However, given the small number of participants with high levels of proactive aggression, firm conclusions about the relationships among the three subtypes cannot be drawn here.

Limitations of the Current Study

The results obtained here are offered as a tentative explanation of the phenomena studied given the significant limitations of this study. While the results could reflect valid findings regarding the subtyping of aggressive behavior in preschoolers, it is equally likely that the characteristics of our sample, lack of

statistical power, or other methodological issues are responsible for the findings. These limitations are discussed below.

Construct Validity/Measurement Issues. A major limitation of this study was the difficulty with grouping participants as proactive and reactively aggressive due to the low levels of proactive aggression in this sample. As noted in previous studies, physical aggression is a widespread problem in preschool. While subtypes of proactive and reactive aggression are easily established in school-age populations, that was not the case in our sample of 3-5 year olds. Because so few children were rated as proactively aggressive (n = 1), analyses requiring groups were not undertaken. This low level of proactive aggression could be measurement artifact. The proactive and reactive aggression scale used in this study raised some measurement issues. In our sample, 10 participants with parent-rated aggression in the clinically elevated range had scores of 0 on this measure. Only one participant was categorized as proactively aggressive. One possible explanation is that the BASC-2, which was used as a screening tool to select the sample, may sample more children with reactive than proactive aggression. While items on the BASC aggression subscale do relate to both subtypes, they more heavily favor reactive types of aggressive behavior. Thus, our sample may have been selected using a measure that was more sensitive to one type of aggression, which could also account for the low number of proactively aggressive children in the sample. Perhaps in future studies a measure of proactive and reactive aggression should be used as a screening tool so that both subtypes are equally likely to be identified if present.

Another possible explanation for the low number of children that exhibited proactive aggression is the scale used for measuring subtypes. The proactive and reactive aggression scale constructed by Dodge has been widely used in school-age populations. However, some of the items may not be appropriate for preschoolers. For example, the item "gets others to gang up on a peer" is less applicable to younger children. In addition, while the scale does have adequate reliability data, it is a 6-item scale with 3 items per subscale. This may have posed a problem for data analysis and contributed to the challenge in specifying proactive and reactive aggressive groups in this sample.

Construct validity could also be at issue in the measurement of proactive aggression in this age range. Another difficulty with the identification of proactive and reactive aggression in preschoolers is that preschoolers are by nature physical and are still learning behavioral and emotional regulation skills. As noted by Valiente et al. (2005), children's behavior looks less reactive with age as they learn more emotional control. Most children who aggress in preschool do so in a physical and impulsive manner due to their developmental level. Proactive aggression, on the other hand, is thought to be more cognitively linked and thought to be learned from role models, resulting in later onset of this behavior. Preschoolers may not yet have had the experience of the volitional use of aggression for advantage over their peers. These issues might make it difficult to distinguish subgroups at this age. It could be that our current sample is too young to have large numbers of children identified as proactively aggressive, which would account for the small size of this group.

Thus, it is possible that preschool is too early an age range to be examining this distinction, but rather, a good time to obtain baseline and observe the trajectories of aggressive behavior unfolding. It is also possible, that with more appropriate items and a more psychometrically sound measure geared to the developmental level of preschoolers, proactive and reactive aggression is a valid and measurable distinction. Given the significant limitations of our study, we are unable to answer this question. Further research, particularly longitudinal data, is needed to clarify this issue. It could be that by identifying parental and community level correlates during this age range, we could be identifying children who are at risk for developing proactive aggression in middle childhood, and better predict the trajectory of their aggressive behavior.

Sample Characteristics. While efforts were made to collect an ethnically and socioeconomically diverse sample, our sample was mostly minority and living in poverty. Links between poverty and child behavior are often found in research in this area (McLoyd, 1998) perhaps through relationships with other variables such as dangerous neighborhoods and poor supervision (Yoshikawa, 1994). While monthly income was not correlated with any parenting measure or measure of child behavior in our sample, the fact that our aggressive sample was mainly minority and living in poverty again demonstrates the association between SES, parenting stress, and child behavior. Recent research indicates that neighborhood disadvantage, in addition to family level correlates such as parenting and interparental violence, combine to place children at risk for antisocial behavior (Ingoldsby et al., 2006). The family stress model states that economic pressure leads to depression and anger in caregivers, and

then to caregiver conflict and parenting that is lower in nurturance and involvement (Conger et al., 2002). While neighborhood disadvantage and economic pressure were not directly measured here, our sample has many of the same characteristics as samples in the aforementioned studies (i.e., mostly poor, minority, single mothers).

Efforts were also made to include multi-informant data collection, however, more teacher ratings would have been helpful in understanding emotion regulation and aggressive behavior in the context of the classroom, which for many children is where the majority of aggressive behavior occurs. It is also a limitation of this study that parents were the only rater of both independent and dependent variables. Had another informant or observer corroborated these behaviors, the issue of having a single rater would have been mitigated. Other caregivers, such as fathers and grandmothers, could also provide important perspective on the aggressive behavior of these children. In measuring issues such as parental violence and punitive parenting, father's ratings would be particularly important as studies have demonstrated a unique link between these variables in fathers and their children's externalizing behavior (Chang et al., 2003; Hazen et al., 2006).

The results obtained here differ from those found generally in the aggression literature, which could be a result of the characteristics of our sample. In many ways, the sample obtained for this study is different from those found in the aggression literature. Our sample measured aggression in both boys and girls, in a primarily African-American, low SES sample. Most of the studies reviewed here used samples of middle class Caucasian boys. Rather than being at-risk for aggression, or a

normative sample, the children studied here were identified as exhibiting clinical levels of aggressive behavior. Also, most studies are examining aggressive behavior in school-age children or adolescents. The current study looks at preschoolers, and uses measures and hypotheses that are based on research with older children.

Study Design. Another limitation of this study is the correlational nature of the data. A correlational study is not capable of assessing directionality, and thus it is unknown if proactive and reactive aggression are caused by the measured parent and child variables. It is equally likely that the causal direction is reversed or another unmeasured variable accounts for the relationships demonstrated here. As students of parent-child interactions are keenly aware, there is complex interplay between parenting and child variables, such as temperament. Only well designed longitudinal studies can begin to untangle the intricacies of parenting and child outcomes.

In addition, we were constrained by the number of participants and could not include a number of important variables in the data analysis. Measures of maternal psychopathology, the use of positive discipline strategies, child attachment, and other key variables might have provided valuable insights into the differences between these two aggressive subgroups. Given the significant relationship between maternal variables and child aggression, maternal psychopathology would be particularly important to measure in future studies. Even though some of the variables chosen did have a significant relationship in predicting proactive, reactive, and pervasive aggression, the tested models were a poor fit and other variables are surely important

to include. Given the low levels of proactive aggression at this age, our small sample size was unable to detect some, but not all, of the hypothesized relationships.

Strengths of the Current Study

A major strength of this study is the inclusion of only aggressive participants. Many studies examine correlates and subtypes of aggressive behavior within a normative sample or those at risk for aggression; however, it is likely that using a normative sample might obscure important features of groups of reactive and proactive aggressive children. In fact, the usefulness of theories such as Keenan and Shaw's is the prediction of which children will develop clinically significant aggression, not mild levels of aggression. Patterns of proactive and reactive aggression might look different within groups of aggressive children versus a normative sample, and thus for identification and intervention purposes, the study of such behavior in an aggressive sample is important.

The current study is one of the first to examine hypotheses regarding emotion regulation, negative emotionality, and subtypes of aggression. These hypotheses have been offered elsewhere, but not yet tested. While the findings presented here only partially support these hypotheses, they provide a valuable initial test and reference point for future studies. The causal theory of proactive and reactive aggression presented by Keenan and Shaw provides many tentative hypotheses to be tested, and this study is a step in that direction.

A strength of this study is the multi-informant data collection, for those participants for whom teacher data was obtained. Teachers and parents agreed about

reactive aggression, but not proactive aggression. Consistent with the literature (but not the parents in this study), teachers' rating showed a negative association between reactive aggression and emotional regulation skills such that children who were more reactively aggressive were less emotionally regulated. Had more teachers participated, their ratings could have also been used for the regression analysis. Unfortunately, too few teacher ratings were collected for those analyses. While other studies have examined the links between parental discipline, childhood physical aggression, and child self-regulation, this study is one of the first to examine how these variables relate specifically to proactive and reactive aggression. Despite finding only limited support of the hypotheses, the unanticipated findings discovered here might serve as a starting point for future studies regarding the parent and child correlates of proactive and reactive aggression.

Clinical Implications

One of the principal goals of delineating subtyping systems such as the present system for proactive and reactive aggression is to enhance prediction and treatment utility. With this goal in mind and the presentation of each type outlined thoroughly, researchers have speculated on treatments that could be more effective when distinguishing between predominantly proactive or reactive aggressive behavior and matching interventions to the particular deficits of each subtype (Smithmeyer et al., 2000). For instance, proactively aggressive children have been shown to hold more positive views of aggressive behavior, feel that they will be more favorably viewed by peers for engaging in aggressive behavior, and feel more confident about behaving in

such ways (Dodge et al., 1997; Waschbusch, Willoughby, & Pelham, 1998). The most efficacious treatment of these children would target such beliefs and modify the environmental conditions that reward aggressive behavior, perhaps by helping them learn new behaviors for achieving their desired outcome through psychoeducational interventions or cognitive behavioral therapy. On the other hand, reactively aggressive children do not hold positive views of aggressive behavior, and such an intervention would be inadequate. An effective intervention for these children would include social skills and problem solving training, as well as enhancing their cognitive and behavioral self-control (de Castro et al., 2005; Day, Bream, & Pal, 1992).

In addition to considering intervention strategies, it is also important to establish correlates of these subtypes of aggression for the purpose of evaluating psychopathology. The current findings suggest that an evaluation of a child who presents with aggressive behavior might not be complete without consideration of the child's negative emotionality and the level of violence in the home. Should Keenan and Shaw's theory prove viable, assessment of parent-infant and parent-toddler interactions could prove to be the first step in evaluating and treating early aggression problems. Prevention programs starting during a child's infancy would be dependent on evaluation for selecting families for intervention. These evaluations could be driven by Keenan and Shaw's theory and findings for correlates of proactive and reactive aggression.

Interventions are only useful if they are applied to the appropriate families; thus identifying these families in need is vital. As research continues to explore the

relationships between family stress, parenting, and child outcomes, families under stress need intervention that is appropriate and efficacious. Thus, disadvantaged neighborhoods should be targets for intervention, especially families at risk for violence through high stress and economic pressure. The theory presented by Keenan and Shaw also holds implications for intervening with parents during their child's infancy. Since earlier intervention has been shown to be more effective, it will be important to continue to test their theory and consider the implications for clinical work with parents of infants and toddlers.

Future Directions

In addition to clinical considerations, the current research raises important issues for future research. In testing unexamined hypotheses set forth here and in other sources, it was determined that reactive aggression was not uniquely associated with deficits in emotion regulation and negative emotionality. Again, this was the first study to test hypotheses regarding emotion regulation and aggression subtypes. More studies are needed to confirm or refute these findings.

This study is also the first to associate young maternal age and inconsistent parenting with reactive aggression. Further study is needed to determine if this is specific to our data or is a generalizable finding. Links between inconsistent parenting, harsh parenting, and interparental violence hold great promise for elucidating the pathways to proactive and reactive aggression. Determining the mechanism by which these variables are related will help researchers better understand the nature of parent's contributions to children's aggression.

Research is lacking in terms of exploring longitudinal outcomes for proactively and reactively aggressive children. Longitudinal research covering the onset of aggressive behavior, the normative period of adolescent antisocial behavior, and following individuals to determine which become antisocial adults, is sorely needed. The few studies that exist have findings that are inconclusive or contradictory. An issue raised by this study is the difficulty of subtyping the aggression of preschoolers. Since the differentiation of aggressive behavior into subtypes may happen at a later age as the development of emotion regulation unfolds, longitudinal studies will be vital to our understanding of aggressive behavior trajectories.

Given the nature of the problem of aggressive behavior in preschool and beyond, research in this domain will surely continue. The attention of aggression researchers has turned to the etiology and sequelae of subtypes of aggressive behavior. The current state of the literature suggests that early intervention, links to self-regulation, and consideration of the parent-child relationship will be fruitful areas of inquiry. This study has attempted to tie together some of these parent and child domains while testing new hypotheses related to proactive and reactive aggression in preschoolers.

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FOOTNOTES

1. Regressions were also conducted entering gender as a predictor of each type of aggression. Gender was not found to be a significant predictor of aggression subtype in any of the analyses.

APPENDIX: TABLES

Table 1: Demographic Data

Gender			**Race**					
Male	n = 52	69%	Caucasian	n = 17	23%	Hispanic	n = 2	3%
Female	n = 23	31%	African American	n = 55	73%	Other	n = 1	1%
Maternal Education			**Marital Status**					
Some High School	n = 14	19%	Single	n = 35	47%	Widowed	n = 1	1%
HS Graduate	n = 29	39%	Living together	n = 9	12%			
Some college	n = 29	39%	Married	n = 20	26%			
College grad. and beyond	n = 2	3%	Divorced/separated	n = 10	13%			

Table 2: Means and Standard Deviations of Measures

Measure	mean	sd	min	max	skewness
APQ Inconsistent Discipline	13.32	4.15	6	22	.23
APQ Corporal Punishment	5.03	1.66	3	9	.60
ERC Lability/Negativity	9.99	2.35	4	14	-.77
ERC Emotion Regulation	16.65	2.32	10	20	-.67
CCNES- Punitive Responding	30.21	11.73	12	67	.81
PC-CTS	9.37	14.72	0	109	4.88*
CTS	4.95	10.15	0	53	2.94*
Proactive Aggression	1.63	2.14	0	8	1.28
Reactive Aggression	3.07	2.27	0	9	.69
Teacher ERC Lability/Negativity	9.15	2.80	4	15	.22
Teacher ERC Emotion Regulation	15.12	3.09	10	19	-.39
Teacher Proactive Aggression	1.85	2.70	0	9	1.25
Teacher Reactive Aggression	3.09	3.08	0	9	.83
Maternal Age	31.73	8.23	21	68	1.69

Table 3: Group membership by gender

Group	**Males**	**Females**
Non-aggressive	n =3; 5.8%	n = 7; 30.4%
Proactively aggressive	n = 1; 1.9%	n = 0; 0%
Reactively aggressive	n = 34; 65.4%	n = 11; 47.8%
Pervasive aggressive	n = 14; 26.9%	n = 5; 21.7%
Total	n = 52	n = 23

Table 4: Correlation of Measures and Parent Ratings of PA/RA

		1	2	3	4	5	6	7	8	9	10
1.	Proactive aggression	-	.82**	.35**	.16	.36**	-.16	.38**	.21	.13	-.14
2.	Reactive aggression	-	-	.31**	.26*	.40**	-.20	.41**	.26*	.20	-.23*
3.	APQ Corporal punishment	-	-	-	.06	-.01	.04	.41**	.49**	.25	-.20
4.	APQ Inconsistent Discipline	-	-	-	-	.21	-.17	.12	.26*	.44**	.02
5.	ERC lability/negativity	-	-	-	-	-	-.48**	.04	.06	.04	-.12
6.	ERC emotion regulation	-	-	-	-	-	-	.04	-.16	-.08	-.13
7.	PC-CTS	-	-	-	-	-	-	-	.25	-.02	-.13
8.	CTS	-	-	-	-	-	-	-	-	.38**	-.21
9.	CCNES punitive parenting	-	-	-	-	-	-	-	-	-	-.02
10.	Maternal age	-	-	-	-	-	-	-	-	-	-

Table 5: Correlation of Measures and Teacher Ratings of PA/RA

		1	2	3	4	5	6	7	8	9
1.	Proactive aggression	-	.82**	.34	.21	.36**	.00	-.22	.38**	.21
2.	Reactive aggression	-	-	.50**	.37*	.40**	.19	-.42*	.41**	.26*
3.	Teacher PA	-	-	-	.85**	.38*	.59**	-.32	.25	.28
4.	Teacher RA	-	-	-	-	-	.73**	-.39**	.38*	.36*
5.	ERC lability/negativity	-	-	-	-	-	.32	-.23	.04	.06
6.	Teacher Lability/negativity	-	-	-	-	-	-	-.67**	.24	.27
7.	Teacher emotion regulation	-	-	-	-	-	-	-	-.29	-.12
8.	PC-CTS	-	-	-	-	-	-	-	-	.25
9.	CTS	-	-	-	-	-	-	-	-	-

Table 6: Correlations for Boys

		1	2	3	4	5	6	7	8	9	10
1.	Proactive aggression	-	.78**	.46**	.20	.34*	-.17	.38**	.32*	.32*	.02
2.	Reactive aggression	-	-	.45**	.32*	.45**	-.28*	.46**	.36*	.40**	-.04
3.	APQ Corporal punishment	-	-	-	.03	.12	- .09	.43**	.52**	.25	-.25
4.	APQ Inconsistent Discipline	-	-	-	-	.14	-.25	.09	.30*	.41**	.18
5.	ERC lability/negativity	-	-	-	-	-	-.43**	-.00	.13	.14	.08
6.	ERC emotion regulation	-	-	-	-	-	-	.07	-.23	-.24	-.30*
7.	PC-CTS	-	-	-	-	-	-	-	.29	-.02	-.10
8.	CTS	-	-	-	-	-	-	-	-	.38**	-.21
9.	CCNES punitive parenting	-	-	-	-	-	-	-	-	-	-.01
10.	Maternal age	-	-	-	-	-	-	-	-	-	-

Table 7: Correlations for Girls

		1	2	3	4	5	6	7	8	9	10
1.	Proactive aggression	-	.91**	.11	.03	.36	-.07	.50*	-.17	-.35	-.30
2.	Reactive aggression	-	-	.11	.14	.31	-.02	.48*	.06	-.21	-.36
3.	APQ Corporal punishment	-	-	-	.17	-.17	.36	.62**	.41	.16	-.21
4.	APQ Inconsistent Discipline	-	-	-	-	.27	.09	.30	.15	.60*	-.10
5.	ERC lability/negativity	-	-	-	-	-	-.54**	.06	-.06	-.08	-.17
6.	ERC emotion regulation	-	-	-	-	-	-	.07	.10	.23	-.09
7.	PC-CTS	-	-	-	-	-	-	-	.10	.21	-.21
8.	CTS	-	-	-	-	-	-	-	-	.37	-.43
9.	CCNES punitive parenting	-	-	-	-	-	-	-	-	-	-.17
10.	Maternal age	-	-	-	-	-	-	-	-	-	-

Table 8: Expected and actual correlates of proactive and reactive aggression, overall sample.

Type	Expected	Actual
Proactive	inter-parental violence	corporal punishment
		Lability/negativity
		Harsh physical discipline
Reactive	corporal punishment	corporal punishment
	harsh physical discipline	harsh physical discipline
	Low self-regulation	Low self-regulation*
	High lability/negativity	high lability/negativity
		inconsistent discipline
		Inter-parental violence
		Younger maternal age

* only as rated by teachers

Table 9: Regression Analysis Results

	R-square	F	sig	t	sig
1. Proactive Aggression	.27	7.43	.00		
Corporal punishment				3.60	.00
Lability/negativity				3.12	.00
Gender				.51	.61
2. Reactive Aggression	.26	4.18	.00		
Corporal punishment				2.48	.02
Lability/negativity				2.74	.01
Inter-parental violence				.65	.52
Maternal age				.17	.86
3. Pervasive Aggression	.22	3.41	.02		
Corporal punishment				2.60	.01
Lability/negativity				2.14	.04
Inter-parental violence				.37	.71
Maternal age				.51	.61