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The Role of Emotion in the Aggressive Behavior of Juvenile Offenders

Katherine Aucoin
University of New Orleans

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THE ROLE OF EMOTION IN THE AGGRESSIVE BEHAVIOR OF JUVENILE
OFFENDERS

A Dissertation

Submitted to the Graduate Faculty of the
University of New Orleans
in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
In
Applied Developmental Psychology

by

Katherine J. Aucoin

M.S., University of New Orleans, 2003
B.A., Loyola University, 1999

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Abstract

This study examined the roles of emotion regulation, negative emotional reactivity, callous-unemotional traits, and socioemotional competence (i.e., identity, self-esteem, communication skills, work orientation, empathy) in overt aggression in a sample of detained juvenile offenders. Clusters were formed based on type and level of overt aggression exhibited: reactive, proactive/reactive, and low aggression. The proactive/reactive distinction failed to provide differential relationships with dependent variables when compared to an overall level of overt aggression. Results indicate that adolescents high in overall overt aggression exhibit higher levels of callous-unemotional traits and negative reactivity, as well as lower levels of self-concept and self-esteem when compared to those low in overt aggression. Additionally, youth with high levels of both overt aggression and callous-unemotional traits displayed significantly lower levels of empathy. No significant findings for overt aggression and emotion regulation emerged. Implications for interventions with adolescent offenders as well as future research directions are discussed.

Introduction

Adolescents, especially males, commit higher rates of most criminal acts than any other age group, but even arrest statistics grossly underestimate the prevalence of adolescent criminal activity (Henggeler, 1991). However, adolescence is a transitional time during which there are rapid and dramatic changes in physical, intellectual, emotional, and social capabilities. Some children engage in minor delinquent acts for excitement or adventure. For these youth, offending may be considered as part of the framework of child development in which youngsters learn prosocial behaviors by trial and error (Loeber & Farrington, 2000). Moreover, judgment in adolescents is different from adult judgment in that the development of socioemotional factors, such as self-concept and self-esteem, that are presumed to influence decision-making lag behind the development of the cognitive capacities that are required to act as mature and responsibly as adults (Fried & Reppucci, 2001).

When determining whether an adolescent should be tried as an adult, courts consider, among other issues, the youth's level of maturity, including emotional development (Ewing, 1990). Research suggests that aggressive and risk-taking behaviors are associated with deficits in emotional development. Studies show that the inability to regulate emotions and emotionally driven behaviors are central characteristics of risky or problem behavior during adolescence (Cooper, Wood, Orcutt, & Albino, 2003). Savitsky and Czyzewski (1978) found that male adolescent offenders were less accurate in labeling their own and others' emotion states. Additionally, Moriarty and colleagues (2001) found that juvenile sex offenders were less clear about their feelings, and less capable to repair unpleasant moods and prolong positive ones. Bischof and colleagues (1995) found that adolescent offenders had difficulty in controlling their anger and were raised in families that were emotionally disengaged (Moriarty, Stough,

Tidmarsh, Eger, & Dennison, 2001). Additionally, Dadds and colleagues (2005) found that callous-unemotional (CU) traits (i.e., lack of empathy and guilt) significantly improved in the prediction of antisocial behavior, and Vincent and colleagues (2003) suggest that disregarding the presence of CU traits in juvenile delinquents will likely result in high false positive rates when predicting persistent offending. Despite this research, more work is needed on the mechanisms through which emotional development, CU traits, and related behaviors affect the development of aggression.

Juvenile offending is a problematic phenomenon in our society that endures from generation to generation (Loeber & Farrington, 2000). In response to growing fears about violent and aggressive juvenile crime, many policy makers and politicians have even called for lowering the age at which juveniles can be transferred to adult court and exposed to adult penalties (Cauffman & Steinberg, 2000). Increasingly, scholars have realized that juvenile aggression, like many other forms of child problem behavior that wax and wane with age, can best be studied from a developmental point of view (Loeber & Farrington, 2000). The current proposal aims to examine the roles of emotion regulation, negative reactivity, callous-unemotional traits, and socioemotional competence in aggression for juvenile offenders. This work has the potential to inform intervention and prevention efforts aimed at reducing adolescent aggression and offending, and to aid in courts' interpretation and assessment of emotional development and its role in adolescent crime.

Aggression

Subtypes of Aggression

When examining juvenile offending, aggression is often a common component of delinquent acts, delinquency being a legal term that may or may not include aggressive behavior.

Research indicates that juvenile aggression places youth at risk for adult crime, alcoholism and drug abuse, and mental illness (Loeber & Stouthamer-Loeber, 1998). While there are many forms of aggression, overt physical aggression, such as fist fighting and assault with a weapon, is more common among delinquent boys and carries a greater risk of legal sanctions (Coie, Dodge, & Kupersmidt, 1990; Prinstein, Boergers, & Vernberg, 2001). There exist two subtypes of overt aggression (among others) exhibited by juvenile offenders and other aggressive individuals: reactive and proactive (Dodge & Coie, 1987). Reactive aggression is characterized by impulsive, defensive, and angry responses to perceived provocations or threats (Dodge & Coie, 1987; Eisenberg & Fabes, 1992). The goal of this type of aggression is to defend oneself against perceived threat or frustration or to inflict harm on its source (Connor, 2002). Unlike reactive aggression, proactive (also known as instrumental) aggression is not associated with provocation, but is defined as aggression in pursuit of an instrumental goal (e.g., territory, objects, social dominance; Dodge, Lochman, Harnish, Bates, & Pettit., 1997). Youth who engage in proactive aggression tend to value aggression as an effective means of acquiring their desired goals and they anticipate positive outcomes for their aggressive behavior (Dodge et al., 1997). Social information processing models have shown deficits in children who exhibit reactive aggressive responses, such that they show a hostile bias in their attributions in provocative or ambiguous social situations at an early age (Connor, 2002). However, children with proactive aggression demonstrate biases at a later age, expecting significantly more positive uses and results for their aggressive behavior. While reactive aggression appears to be more associated with early developmental experiences, proactive aggression may have its origins in social learning during the elementary school years (Dodge et al., 1997).

Proactive aggression also differs from reactive aggression in its prediction of antisocial behaviors. For boys, proactive aggression during pre-adolescence predicts delinquency and violence during mid-adolescence, and criminal behavior in adulthood (Brendgen, Vitaro, Tremblay, & Lavoie, 2003; Pulkkinen, 1996; Vitaro, Brendgen, & Tremblay, 2002; Vitaro, Gendreau, Tremblay, & Oligny, 1998). In contrast, reactive aggression does not have this predictive value for antisocial outcomes (Pulkkinen, 1996; Vitaro et al., 2002; Vitaro et al., 1998). The emotional aspects of proactive and reactive aggression tend to differ in that low emotion regulation is usually an essential component for most reactive aggressive acts (Loeber & Stouthamer-Loeber, 1998). Also, research indicates that those who engage in proactive aggression also often engage in reactive aggression, although the reverse has not been shown (Dodge et al., 1997). In fact, many studies have failed to distinguish a purely proactive aggressive group (Pitts, 1997; Cornell, Warren, Hawk, Stafford, Oram, & Pine, 1996; Frick, Cornell, Barry, Bodin & Dane, 2003). Interestingly, Hubbard and colleagues (2002) found a strong positive relationship between proactive and reactive aggression ($r = .77$), and others have similarly found high correlations (Brendgen et al., 2003; Vitaro et al., 2002; Vitaro et al., 1998). Therefore, this study hypothesized that those youth who exhibit proactive aggression would also exhibit reactive aggression as described above. Subsequently, this study also proposed that these different types of aggression would be influenced by social and emotional competence.

Age-of-Onset and Callous-Unemotional Traits

Interestingly, the offenses committed by youths who begin exhibiting problem behaviors in adolescence and whose behavior is often limited to adolescence (i.e., adolescent-limited or adolescent-onset) tend to show less aggressive forms of antisocial behavior (Moffitt, 2003). However, those who begin exhibiting problems much earlier in development tend to show much

greater rates and severity of aggression (i.e., life-course persistent or childhood-onset; Moffitt, Mednick & Gabrielli, 1989). Several studies exist demonstrating the pathways that juvenile offenders may take depending on the age of onset of behavioral problems, with much of this research based on a theory put forth by Moffitt and colleagues (Frick & Morris, 2004; Kjelsberg, 2002; Moffitt, 1993, 2003; Moffitt & Caspi, 2001; Moffitt, Caspi, Dickson, Silva, Stanton, 1996). According to this theory, childhood-onset offenders' antisocial behavior begins in early childhood, has its origins in neurodevelopmental processes, and the behavior continues to worsen into adolescence and adulthood. In contrast, adolescence-limited or adolescent-onset offenders' antisocial behavior begins in adolescence, has its origins in social processes, and desists in young adulthood. According to the theory, childhood-onset antisocial youths are few, behaviorally persistent, and pathological, while adolescent-onset antisocial behavior is common, relatively short-lived, and near normative (Moffitt, 1993, 2003).

Within the childhood-onset group, research suggests that there may be two sub-groups. The callous-unemotional types are characterized by low levels of fearful inhibitions that can place a child at risk for showing severe antisocial and aggressive behavior (Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003; Frick & Morris, 2004; Moffitt, 2003). It is this sub-group who tend to exhibit both reactive and proactive aggressive behavior (Frick & Morris, 2004; Moffitt et al., 1989). These youth begin showing conduct problems early in development and possess a temperament of low fear that could lead directly to these conduct problems by making them more likely to engage in novel and dangerous behavior or indirectly by hindering the development of guilt and empathy, as indicated by a callous/unemotional style and poverty of emotions (Frick, Cornell, Bodin, et al., 2003; Frick & Morris, 2004). The presence of callous (e.g., lack of empathy, manipulateness) and unemotional (e.g., lack of guilt, emotional

constrictedness) traits, which appear to be under strong genetic influence, places a child at risk for antisocial and aggressive behavior (Frick, Cornell, Bodin, et al., 2003; Viding, Blair, Moffitt, & Plomin, 2005). Frick and colleagues (2003) have found that children with both CU traits and conduct problems had a greater number and variety of conduct problems over time than those with only conduct problems, as well as higher levels of aggression, especially proactive aggression, and self-reported delinquency (Frick, Cornell, Barry, Bodin, & Dane, 2003). It is likely that those with CU traits exhibit more proactive aggression due to their lack of behavioral inhibition and lack of empathy, while children with conduct problems only tend to have more difficulties with emotion regulation (Frick, Cornell, Barry, et al., 2003; Pardini, Lochman, & Frick, 2003). Furthermore, children with CU traits have been shown to be less distressed by their behavior problems, and experience less emotional distress overall. It is these children high in CU traits that demonstrate features typically associated with psychopathy, such as a lack of fearfulness and a reward-dominant response style, and are at high risk of developing Antisocial Personality Disorder as adults (Barry, Frick, & DeShazo, 2000; Loeber, Burke, & Lahey, 2002).

However, the sub-group of youth with childhood-onset problems, but who do not show callous-unemotional (CU) traits, shows temperamental and emotional characteristics that can hinder the development of emotion regulation abilities. The resulting problems in emotion regulation for adolescents who do not have CU traits can directly (through aggression in the context of high emotional arousal) and indirectly (through impaired social relationships) place a child at risk for increased impulsivity and aggression, and as a result they typically display reactive aggressive behavior but not proactive (Frick, Cornell, Barry, et al., 2003; Frick & Morris, 2004; Moffitt, 1993). Therefore, there appears to be three primary pathways to serious antisocial aggressive behavior, with youth in each pathway showing several distinct

characteristics: those who begin in adolescence and exhibit difficulties with social processes and engage in less aggressive behavior; those who begin in childhood and exhibit difficulties in emotion regulation and engage in primarily reactive aggression; and those who begin in childhood and exhibit low fearful inhibitions and proactive and reactive aggression. By studying the reactive and proactive subtypes of aggression, we can simultaneously examine the pathways that juvenile offenders may take by age of onset. In the current study we will not specifically examine age of onset, but will study proactive and reactive types of aggression with the understanding that individuals high in aggression, particularly proactive, most likely represent the early-onset group.

Emotion

Emotion is defined as a functional reaction to an external stimulus event, temporarily integrating physiological, cognitive, phenomenological, and behavioral networks to facilitate an environment-shaping response to a situation (Keltner & Shiota, 2003). Some theorists have argued that emotions are the primary motivational system for human behavior (Izard, 1971; Tomkins, 1963). Emotions directly affect what we perceive, how fast we process information, and what we think and how we act in response (Crick & Dodge, 1994; Zajonc, 1980). Multiple factors determine whether emotions motivate cognition and action that reflect successful adjustment, or move the individual along a pathway toward maladaptive outcomes. Work by researchers such as Cicchetti, Sroufe, and Rutter in developmental psychopathology has led to an emphasis on the importance of emotional processes in normative and non-normative development (Stoutham-Gerow & Kendall, 2002). Emotions serve to aid judgment, by potentially routing thoughts in the correct direction, and emotional reactions can help to focus one's cognitive resources on the problem at hand. The experience of negative emotions is widely

viewed as an antecedent to multiple forms of risky or problematic behaviors, in that engaging in risky or problematic behaviors may serve as one way to avoid or escape painful negative mood states (Pizaro & Salovey, 2002). According to Westen (1994), individuals who experience frequent or intense negative emotions are more likely to rely on avoidant coping mechanisms that alter emotions directly and operate quickly.

The transition through adolescence is accompanied by many physical, psychological, and social changes that elicit new experiences of emotional arousal. Studies indicate that adolescents experience more frequent and intense emotions than younger or older individuals (Larson, Csikszentmihalyi, & Graef, 1980). Many of the hormonal, neural, and cognitive systems thought to affect the regulation of emotion appear to mature throughout this period of development (Spear, 2000). The occurrence of various forms of psychopathology, including affective and behavioral disorders, increases dramatically during the adolescent period as well. A better understanding of socioemotional development during adolescence may help to understand individual differences in adjustment and behavior during this period of increased risk. However, research on emotion regulation during adolescence to date is scarce, as most work on emotion regulation has focused on younger children (see Eisenberg & Morris, 2002). Adolescent research has focused more on behavioral regulation rather than emotion regulation specifically, and understanding the role of emotional development and regulation are critical for developing prevention programs aimed at reducing juvenile aggression and offending (Frick & Morris, 2004).

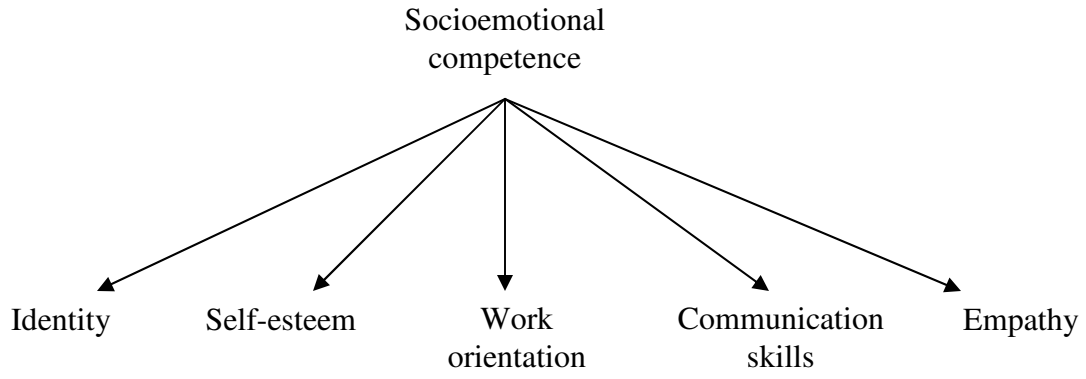
Socioemotional Competence and Its Components

Socioemotional development in adolescence involves many attributes and capacities, including the emergence and continued development of self-reliance, identity, trust, self-esteem,

work orientation, communication skills, knowledge of roles, and empathy (Greenberger, 1984). While there are many factors involved in socioemotional development, the current study focused on specific constructs we believe to be related to delinquent offending and aggressive behavior. Within socioemotional development, many researchers examine socioemotional competence, deficits in which have been found to be associated with different types of aggressive behavior (Arsenio, Cooperman, & Lover, 2000; Bohnert, Crnic, & Lim, 2003; Casey, 1996; Eisenberg et al., 1996; Shields & Cicchetti, 1998).

Saarni (1990, 1999) defines socioemotional competence by outlining several skills that aid in the ability to react in appropriate ways: awareness of one's own emotional state, a vocabulary of emotions, empathy and sympathy for others' emotions, the development of coping skills for dealing with strong and/or unpleasant emotions, and a sense of comfort with one's own emotions. In the current study, we examine emotion regulation as a separate construct, arguing that emotion regulation affects socioemotional competence, or is a precursor to socioemotional competence. In the proposed model, socioemotional competence is defined as the ability to successfully interact, in socially appropriate ways, in a social context, such as with peers or at work. Variables implicated in this definition include identity (or a strong sense of self), self-esteem, work orientation/achievement motivation, communication skills, and empathy (see Figure 1). These components of socioemotional competence also are chosen as indicators of the construct, as research indicates that these factors are closely linked with the development of aggression (Brier, 1995; Capaldi & Stoolmiller, 1999; Cohen & Strayer, 1996; Connor, 2002; Ellis, 1982; Hansen, St. Lawrence, & Christoff, 1988; Hay, 2000; Moretti, Holland, & McKay, 2001; Loesel & Bliesener, 1994; Miller & Eisenberg, 1988; Moffitt & Lynam, 1994).

Figure 1
The Model of Socioemotional Competence



Identity (or self-concept) is a relatively stable schematic of oneself that is defined as the ways in which an individual perceives him/herself across time and space (van Hoof, 1999). During adolescence, individuals explore different alternatives and arrive at specific adult roles. Perceiving oneself in a particular role helps an adolescent to construct an identity (Nurmi, 2004). When adolescents have a concept of their own worth as individuals, they will be better able to function adequately on their own compared to people who lack these qualities (Greenberger, 1984). Identity formation also assists in the ongoing clarification of self-esteem (Greenberger, 1984). Self-esteem involves the ways in which individuals evaluate themselves according to normative or self-related standards (Nurmi, 2004). Self-esteem is a recognition of personal worth developed through a sense of competency, efficacy, connection to others, and mutual respect. Like confidence, self-esteem is tied to the ability to self-validate, and act based on self-perception or an inner voice.

Another indicator of socioemotional competence in adolescence includes a positive work orientation. This consists of general work skills, aspirations for competent work performance, and a capacity to experience pleasure in work (Greenberger, 1984). These features are crucial in that they prepare adolescents for day-to-day living. Daily living also dictates that to be effective in dealing with others, individuals must be able to express facts, opinions, ideas, and desires in a manner that is understood (Greenberger, 1984). The ability to be assertive and communicate well involves conveying verbal and nonverbal messages, as well as receiving them. Effective interpersonal communication is also related to empathy, defined as being able to identify with another person's feelings, motives, and situations. This allows adolescents to adopt the role or point of view of others, enabling them to anticipate thoughts and ideas the listener may have and thereby to form and convey messages more effectively (Greenberger, 1984).

Socioemotional Competence and Aggression. The five constructs described above are essential in the development of socioemotional competence. Indeed, when development is deficient or lagging behind peers in these domains, some youth are at risk for antisocial and aggressive behavior. Specifically, research has found that youth with low or negative self-concepts (identity) are more likely to experience persistent behavior problems and engage in delinquent behavior (Hay 2000; Svobodny, 1982). Moretti and colleagues (2001) found that negative self-identities predicted overt aggression and assaultive behavior in adolescents, while more positive self-concepts were found in children who did not exhibit serious behavioral and emotional problems (Loesel & Bliesener, 1994). Additionally, low self-esteem has been found to be associated with externalizing behavior, conduct problems, and reactive aggressive behavior in children (Barry, Frick, & Killian, 2003; Capaldi & Stoolmiller, 1999; Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Frankel & Myatt, 1996; Sutherland & Shepherd, 2002). Simons, Paternite, and Shore (2001) found that higher self-esteem was associated with lower aggression and higher prosocial behavior in adolescents. Therefore, poor identity and low self-esteem both contribute to reactive aggressive behaviors in adolescents in that these youths do not have the confidence in themselves or beliefs that aid in acting in socially appropriate ways when confronted with provocation or hostile environment.

While no studies exist specifically addressing work orientation and aggressive behavior in adolescents, much of their “work” takes place in school. Academic competence and achievement have been found to be protective factors against antisocial behavior, while academic failure, including negative school attitudes, has been found to act as a risk factor and is associated with adolescent antisocial behaviors and aggression (Brier, 1995; Connor, 2002; Davis, Byrd, Arnold, Auinger, & Bocchini, 1999). Youth who lack adequate work orientation

may also lack aspirations to be positive contributors to society, and therefore do not (or are unable to) curb their aggressive behaviors.

Some academic failure may be related to poor verbal skills. Consequently, low verbal IQ has consistently been found to be associated with antisocial behavior, while high verbal IQ acts as a protective factor (Lahey, Waldman, & McBurnett, 1999; Moffitt & Lynam, 1994; White, Moffitt, & Silva, 1989). Griffin, Epstein, and Botvin (2001) found better communication skills in adolescents who reported less smoking and drinking, while Hansen and colleagues (1988) found that conduct-disordered youths were significantly deficient in their use of a variety of conversational skills and behaviors. Dumas, Blechman, and Prinz (1994) found that aggressive youths exhibited less effective communication skills and more disruptive communication than non-aggressive youths. More specifically, some research links deficits in verbal processing and verbal IQ with impulsive or reactive aggression (Stanford, Greve, & Gerstle, 1997; Vitiello, Behar, & Hunt, 1990). These deficiencies in communication skills may lead adolescents to use aggression as their way of communicating.

Finally, many youth with behavioral disorders have been found to be lacking in empathy, especially those diagnosed with conduct disorder (CD; Miller and Eisenberg, 1988; Schonert-Reichl, 1993). Youth with CD, especially those who are undersocialized and aggressive, may express little empathy and little concern for the emotions, well-being, wishes, and concerns of others (Connor, 2002). Therefore, they do not think about or are not bothered if they hurt others by acting aggressively toward them. Cohen and Strayer (1996) found that empathy was lower among conduct-disordered than comparison youth and was related inversely to antisocial and aggressive attitudes for all youth tested. Aggressive delinquents tend to be significantly lower in empathy level than non-aggressive delinquents, while non-delinquents exhibit age-related

increases in empathy during the adolescent period (Ellis, 1982). Although deficits in other components of socioemotional competence, namely identity, self-esteem, work orientation and communication skills, appear linked to reactive aggression only, research indicates that deficits in empathy are more closely linked with those who exhibit proactive aggression. Studies on youth who lack appropriate empathy or exhibit callous and unemotional traits show that these children not only use more proactive and premeditated forms of aggression, but also more overall aggression (Blair, 1999; Christian et al., 1997; Frick, Cornell, Barry, et al., 2003; Frick, Lillienfeld, Ellis, Loney, & Silverthorn, 1999).

Adolescents must remain flexible so that they can alter their emotional expressions and behavior in response to different social contexts and situations (Shipman, Zeman, & Stegall, 2001). Implemented in socioemotional development and psychological adjustment, there also exists evidence of a link between emotion dysregulation and aggressive behavior that is common in juvenile offenders (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Davidson, Putnam, Larson, 2000; Henry, Caspi, Moffitt, & Silva, 1996; Pulkkinen, 1996; Rothbart et al., 1994).

Emotional Regulation and Reactivity

Emotion regulation is defined as the regulation of both internal and external experiences of emotion, involving initiation, modulation, or maintenance of these internal states and their physiological components (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg, Morris, & Spinrad, 2004; Thompson, 1994). These skills allow individuals to strengthen or hinder their socioemotional development. However, when there are deficits in regulation, aggression and behavioral problems in children are likely to emerge (Rothbart et al., 1994). There is also evidence that early problems with regulation may lead to problems in later adjustment and the development of adult psychopathology (Caspi, 2000; Pulkkinen & Hamalainen, 1995). Eisenberg

and Fabes (1992) argue that self-regulation arises from the interaction between emotional intensity and internal regulatory processes (such as attentional shifting, approach, and inhibitory mechanisms). Their model predicts that individuals who experience negative emotions very intensely and have poor regulatory skills are easily aroused and prone to aggressive outbursts.

Emotion regulation and related processes are closely linked with temperament. While temperament is believed to have a biological origin (Larsen & Diener, 1987; Rothbart & Derryberry, 1981), it can be affected to some degree by social influences. A principal dimension of temperament that has consistently been associated with socioemotional development and is closely linked to emotion regulation is effortful control. Effortful control, a widely used indicator of emotion regulation, is the ability to restrain one's emotional reactivity and is reflected in attention shifting and refocusing and inhibitory control processes (Rothbart & Derryberry, 1981). These attentional mechanisms allow a person to shift attention away from an emotion-eliciting stimulus. While attention refocusing and shifting involves changing the direction or object of one's primary attention, inhibitory control involves the capacity to plan and to suppress inappropriate action. Inadequate inhibitory control is often revealed by impulsive behaviors and is believed to play a role in the development of psychopathology in both children and adults (Rothbart, Ahadi, & Evans, 2000). Kochanska, Murray, and Coy (1997) found individual differences in inhibitory control to have important implications for active inhibition of antisocial behavior and acquisition of prosocial behavior. Youth who can effectively use attentional abilities to regulate behavior are better able to inhibit prepotent responses. They are better able to consider the effect of their actions on others, facilitating internalizations of standards for prosocial behavior.

Effortful control is also reflected in inhibitory and activation control, or the abilities to effortfully inhibit inappropriate behavior and activate appropriate behavior (Eisenberg & Morris, 2002). In general, people with low effortful control are predicted to be relatively low in social competence and prone to externalizing behavior problems. Externalizing youth score consistently lower on attentional regulation and inhibitory control and higher on impulsivity than are control youth, and are less regulated on some of the behavioral measures of effortful regulation (Eisenberg et al., 2001). Caspi and colleagues (1997) found that high impulsivity and high negative emotionality predicted involvement in multiple risk behaviors, including risky driving, problem drinking, risky sexual behavior, and violence.

Orobio de Castro and colleagues (2003) found that monitoring and regulation of one's emotions reduced aggressiveness in a group of highly aggressive boys. Eisenberg and colleagues (1996) found that low emotion regulation and high emotional intensity (negative, positive, and general) predicted behavior problems and that emotion regulation buffered the effects of negative emotional intensity. Additionally, there is evidence that many children with aggressive or delinquent behavior show problems regulating their display of negative emotions. A study by Silk and colleagues (2003) provides support for the idea that emotion regulation is a central link between behavioral and emotional problems among adolescents (Silk, Steinberg, & Morris, 2003). The similarity of findings across different aspects of emotion regulation (i.e., intensity, lability, regulation patterns, strategy use) and symptom measures supported the idea that adolescents who had problems regulating their emotions were more vulnerable to externalizing problems. In this study, adolescents who were less likely or less able to regulate negative affect during real-life emotional experiences reported more symptomatology compared with those who recovered from negative experiences more easily. Adolescents who were able to recover from

feeling sad, angry, or anxious were much less likely to report problem behavior than adolescents who were not able to alter these negative emotions. Intensity of emotion and variability in levels of emotion from moment to moment were also related to behavior problems (Silk et al., 2003).

Henry and colleagues (1996) found that a factor labeled Lack of Control, characterized by aspects such as emotional lability, restlessness, impulsiveness, and negativism, to be associated with teacher and parent reports of externalizing behavior problems in children (Caspi et al., 1995). The findings of this study suggested that childhood family factors place individuals at a generalized risk for criminal conviction, whereas measures of childhood temperament (Lack of Control) appeared to be specifically associated with having at least one *violent* conviction by the age of 18 (Henry et al., 1996). The data indicated that it is the combination of lack of social regulation and self-regulation that sets the stage for serious offending.

Although strategies of emotional self-regulation originate in young infants' simple efforts to cope with distress, they quickly become integrated into a network of behavioral strategies by which children and adults seek to maintain personal well-being, manage their relations with others, behave consistently with their self-image, manage their self-presentation to the social works, and achieve a variety of other goals (Thompson & Calkins, 1996). However, emotion *dys*regulation produces emotional, cognitive, and/or behavioral outcomes that are maladaptive for the individual in a given situation, specifically aggressive, antisocial and possibly criminal behavior (Underwood, 1997). Data suggest that deficiencies in regulating negative emotions and emotionally driven behaviors are core features of problem behaviors during adolescence (Cooper et al., 2003). A youth who shows intense dysregulated displays of negative emotions is more likely to be rejected by peers (Rubin, Bukowski, & Parker, 1998). This rejection can lead a child to miss out on important socializing experiences that take place within the peer group, such as

learning effective and appropriate social skills. This rejection can also place the child at risk for associating with antisocial and aggressive peers (Keenan, Loeber, Zhang, Stouthamer-Loeber, & Van Kammen, 1995). While there is no evidence directly linking deficits in emotional regulation and reactivity to criminal activity in adolescent offenders, the literature provides ample evidence for a link to aggressive, antisocial behavior, and a majority of adolescent offenders possess antisocial characteristics that put them at risk for a life of crime (Caspi et al., 1995; Davidson et al., 2000; Henry et al., 1996; Pulkkinen, 1996).

Negative Reactivity. While emotional reactivity appears to be a characteristic that generalizes to both the positive and negative affect domains, negative reactivity represents an individual's tendency to react strongly and consistently to contextual events with negative emotions, including anger, fear, sadness, anxiety, frustration, or irritability (Frick & Morris, 2004; Larsen & Diener, 1987). In separating a youth's level of negative reactivity from his/her effortful control of this reactivity, there is evidence that effortful control strategies are also linked to aggression and conduct problems in children (Eisenberg et al., 1996, 2001; Rothbart et al., 1994). However, research also has consistently related high levels of negative emotional reactivity to conduct problems (Eisenberg et al., 2001; Frick, Cornell, Bodin, et al., 2003; Frick et al., 1999; Loney, Frick, Clements, Ellis, & Kerlin, 2003; Morris, Silk, Steinberg, Sessa, Avenevoli, & Essex, 2002) and with antisocial behavior and delinquency later in adolescence and young adulthood (Caspi, 2000; Pulkkinen & Hamalainen, 1995). Research has also demonstrated a relationship between high levels of negative emotional reactivity and aggression (Hubbard et al., 2002; Shields & Cicchetti, 1998). In addition, Rothbart and colleagues suggested that emotion regulation may control the reactive tendencies underlying emotional reactivity, thereby controlling these aggressive tendencies (Rothbart et al., 1994). Finally, the findings of

one study by Loney and colleagues (2003) support previous research in suggesting that different patterns of emotional reactivity may be critical for understanding the different causal pathways through which children and adolescents develop behavior problems. When examining the role of emotional reactivity and CU traits in relation to antisocial behavior, youth who are antisocial but without CU traits tend to be more highly emotionally reactive than those with CU traits (Loney, et al., 2003).

Emotion and Adjustment

It is clear from the literature cited above that deficits in socioemotional competence, emotion regulation, and negative reactivity can lead to the development of antisocial and aggressive attitudes and behaviors in youth. Youth who optimally develop identity, self-esteem, work orientation, communication skills, and empathy tend to be more prosocial and mentally healthy. Additionally, for optimal adjustment, emotion regulation skills are important. Eisenberg (2001) states that emotion regulation is, in some ways, the core of socioemotional competence, as managing one's emotions contributes considerably to competence in both the ability to receive and send emotional messages, as well as to social behavior.

The regulation of emotions may facilitate positive affect in the evaluative process of self-esteem in that better emotional regulation is associated with greater self-esteem (Schutte, Malouff, Simunek, McKenley, & Hollander, 2002). Situational threats to self-concept contribute to one's tendency to regulate emotions such that regulating emotions in emotion-producing circumstances allows for emotion/self-concept compatibility (Mendolia, 2002; Scherer, 1982). Stucke and Sporer (2002) found that those with low self-concept clarity reacted to failure with high levels of aggression, while those with high self-esteem did not. However, over-regulation of emotion has been found to disrupt communication, contribute to reduced rapport, and inhibit

formation of relationships (Butler, Egloff, Wilhelm, Smith, Erickson, & Gross, 2003). Moreover, emotion regulation in the classroom is related to measures of academic achievement and makes a unique significant contribution to students' GPA, providing support for the role of socioemotional factors in students' work performance and orientation (Gumora & Arsenio, 2002; Howse, Calkins, & Anastopoulos, 2003).

Adolescents must remain flexible so that they can alter their emotional expressions and behavior in response to different social contexts and situations (Shipman, Zeman, & Stegall, 2001). Implemented in socioemotional development and psychological adjustment, there also exists evidence of a link between emotion regulation and negative reactivity to antisocial and aggressive behavior that is common in juvenile delinquency (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Davidson, Putnam, Larson, 2000; Henry, Caspi, Moffitt, & Silva, 1996; Pulkkinen, 1996; Rothbart et al., 1994). In most situations, negative reactivity is negatively associated with socioemotional competence (Coie, Dodge, & Kupersmidt, 1990; Dodge, 1991; Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994). Empathy has been found to be negatively associated with aggression and negative reactivity, as individuals who show more anger also tend to have lower rates of empathic responses (Hughes, White, Sharpen, & Dunn, 2000; Strayer & Roberts, 2004). Negative reactivity is also related to self-concept confusion (Lavalley & Campbell, 1995). Individuals may direct anger outward as a way of avoiding a downward change in their self-concept (Baumeister, Smart, & Boden, 1996). Finally, some youths report using forms of negative reactivity (i.e., anger) and mild aggressive methods to communicate their feelings (Zeman & Shipman, 1996).

Thompson and Calkins (1996) hypothesized that for reactively aggressive boys who tend to construe hostile intent in seemingly benign encounters with peers, problems of emotional

regulation may both arise from and contribute to their impaired skills. This pattern of results is consistent with findings indicating that both negative emotionality and low regulation predict reactive aggression (Caspi et al., 1995; Pulkkinen, 1996). Indeed, emotion dysregulation seems to be primarily related to reactive forms of aggression (Hubbard et al., 2002; Shields & Cicchetti, 1998). Therefore, the current study hypothesized that youths with low levels of competence in the areas of identity, self-esteem, communication skills, and work orientation would also have low levels of emotion regulation, and therefore exhibit higher levels of reactive aggression. However, variations in youths' emotion regulation may also underlie some of the individual differences that have been found in empathy (Arsenio & Lemerise, 2001). Several studies have implicated empathy-related responding to better emotion regulation (Eisenberg, Wentzel, & Harris, 1998; Rothbart, Ahadi, & Hershey, 1994). However, youth with low emotional reactivity or lack of negative emotional responses also measure high on emotion regulation, which may produce an inability to self-generate empathy when utilizing and planning aggressive acts (Hubbard et al., 2002; Kochanska, 1997). Those youth with a lack of empathy typically do not show deficits in emotion regulation (Frick & Ellis, 1999; Frick & Morris, 2004). Therefore, this study hypothesized that youths with low levels of empathy would exhibit higher levels of both reactive and proactive aggression, while those with low levels of emotion regulation and high levels of negative reactivity would display higher levels of reactive aggression only.

The Current Study

The current study adds to the extant literature by examining the roles emotion regulation, negative reactivity, callous-unemotional traits, and socioemotional competence play in aggression for juvenile offenders. Specifically, the study examined if youth exhibit different levels of these variables based on whether they show high levels of reactive aggression only,

both reactive and proactive aggression, or low levels of aggressive behavior. Previous studies have failed to address how emotion regulation, negative reactivity, CU traits, and socioemotional competence specifically influence adolescents who engage in different types of aggressive behavior, and whether deficits in these constructs place them at risk for continued illegal behavior.

The results of this study will be helpful in addressing emotional development when creating intervention programs for antisocial youths. Currently, an array of effective interventions exists that deal with anger management in order to reduce aggressive behavior; however, an *increased* focus on emotion may be beneficial (Stoutham-Gerow & Kendall, 2002). Specifically, enhancing the understanding of the role of emotion regulation and negative reactivity in the development of aggressive behavior could be critical for developing different interventions for a child who has problems in regulating emotions and is highly reactive, as well as if they display high levels of CU traits and their level of development in the areas of socioemotional competence, such as self-esteem, identity, work orientation, empathy, and communication skills.

Some youth are not only troubled by difficult situations and problematic thoughts, but by their own emotions, such as controlling negative emotions like anger. The current research also may be able to inform new programs on how to involve an improved and explicit focus on understanding and better regulating negative emotions, in part through encouraging adolescents either to face and not avoid, or to not completely give in to and tone down, negative emotional experiences. While recognizing and labeling emotions can be helpful in learning to regulate emotions, especially negative ones, being able to identify those who are lacking in socioemotional competence may also help in learning to regulate emotions. Additionally, the

distinction between reactive and proactive aggression suggests specific treatment interventions, and paired with the roles of emotion regulation, negative reactivity, CU traits, and socioemotional competence, these interventions can become more targeted and explicit for each youth in order to obtain the best possible outcome (Dodge, 1991). An intervention for a youth exhibiting a lack of empathy, high levels of CU traits, and both reactive and proactive forms of aggression will likely be different from an intervention for a youth exhibiting deficits in emotion regulation, self-esteem, identity, communication skills and work orientation, and exhibiting high levels of negative reactivity and reactive aggression.

Hypotheses

The current study aimed to examine the roles of emotion regulation/effortful control (i.e., attention and inhibitory control), negative reactivity, callous-unemotional traits, and socioemotional competence in aggressive behavior (see Table 1).

- 1) It was hypothesized that adolescents who exhibit reactive aggression only (reactive only group) would display the lowest levels of emotion regulation and the highest levels of negative reactivity compared to those who exhibit high levels of both proactive and reactive aggression (proactive/reactive group) and those who exhibit low levels of both types of aggression (low aggression group). It was also hypothesized that adolescents in the proactive/reactive aggression group would report the highest levels of callous-unemotional traits when compared to the reactive only group and the low aggression group. Thus, it was hypothesized that poorer emotion regulation and high negative reactivity places a youth at risk for higher rates of reactive aggressive behavior, while high levels of CU traits place a youth at risk for proactive and reactive aggressive behavior.

Table 1
Hypothesized Relationships between Study Variables and Types of Aggression

	Reactive & Proactive	Reactive Only	Low Aggression
Emotion Regulation	>	<	<
Negative Reactivity	<	>	>
CU Traits	>	=	=
Self-Esteem	>	<	<
Communication Skills	>	<	<
Work Orientation	>	<	<
Identity	>	<	<
Empathy	<	=	=

Note. CU = Callous-Unemotional Traits; All variables coded as strengths.

1a) It was also hypothesized that when combining proactive and reactive aggression (due to their likely high correlation) for a level of overall overt aggression, adolescents high on overt, or overall aggression would display higher levels of emotional problems (i.e., high CU traits, high negative reactivity, low emotion regulation) than those with low levels of overt aggression.

2) It was hypothesized that the components of socioemotional competence would be differentially related to type of aggression exhibited. Specifically, it was hypothesized that the levels of the components of socioemotional competence, excluding empathy, would be significantly lower for those in the reactive only group when compared to those in the proactive/reactive group and those in the low aggression group. Additionally, it was hypothesized that empathy would be significantly poorer for those exhibiting both reactive and proactive aggression when compared to those who exhibit reactive aggression only or low aggression.

2a) It was also hypothesized that when combining proactive and reactive aggression for a level of overall overt aggression, adolescents high on aggression would display lower levels of all components of socioemotional competence than those low on aggression.

3) In order to further explore patterns of aggression and emotionality, high and low levels of overall aggression combined with high and low levels of callous-unemotional traits and high and low levels negative reactivity were also examined. These factors were investigated in relationship to the five components of socioemotional competence and emotion regulation. It was expected that adolescents exhibiting both high levels of CU traits and high levels of aggression would report the lowest levels of empathy. It was also expected that adolescents exhibiting high levels of aggression and high levels of negative

reactivity would report the lowest levels of emotion regulation, as well low levels for the four remaining components of socioemotional competence (i.e., self-esteem, work orientation, communication skills, and identity).

Method

Participants

This study examined adolescent boys in a pretrial detention facility. As described above, adolescence is a significant time of social and emotional development, key variables in the current study (Steinberg, 1999). However, few studies have examined emotion regulation in adolescence (Eisenberg & Morris, 2002). Few studies have examined the proactive/reactive distinction in adolescent samples (Boxer, Tisak, & Goldstein, 2004; Prinstein et al., 2001), while those who have examined adolescents have generally used community samples which tend to produce considerably lower rates of overall overt aggression, especially severe forms of aggression, as opposed to delinquent samples where severe aggressive behavior is more common (Boxer et al., 2004; Prinstein et al., 2001). As noted earlier, overt aggression is more typically evidenced by boys when compared to girls, therefore the current study focused on boys only, and overt, rather than relational, aggression (Boxer et al., 2004; Loeber & Stouthamer-Loeber, 1998; Prinstein et al., 2001; Rutter & Giller, 1983).

Participants for the current study were drawn from L. Roberts Rivarde Memorial Home (Rivarde). Rivarde is a pretrial juvenile detention facility serving Jefferson Parish, Louisiana. It provides temporary secure treatment and confinement for serious, chronic, juvenile offenders who pose a threat to the community or themselves while awaiting court hearings. The detention center is a modern pod design with fifty-two individual resident rooms, licensed capacity for

fifty-four residents, and Federal court ordered maximum population of fifty-five residents (Thomas, 1998). According to a 1998 report, there were 1,697 admissions, where the average daily population was 50.3 youths and the average stay was 11.6 days. Residents at Rivarde range in ages from ten years to twenty-plus years, with 15.2 years being the average age, and fifteen to sixteen years accounting for 55% of all detainees. In the current study, the mean age of participants was 15.7, with a range from 13 to 18 years, and an average school grade of 8th (see Table 2). In 1998, 67% of the youth were male, 33% were Euro-American, 63% African-American, and 4% were Other. In the current study, 23% were Euro-American, 68% were African-American, and 9% were Hispanic, Native American or Other (see Table 2). Center data indicate that serious offenses (e.g., murder, rape, arson, etc.) accounted for 22% or 581 admissions, and lesser offenses (e.g., disturbing the peace, resisting a police officer, etc.) accounted for 78% or 2239 admissions, while property offenses accounted for 16% or 439 admissions (Thomas, 1998). In the current sample, youths had an average of six prior arrests and three prior detentions. A majority of the participants were being detained for property offenses (41%) and violent offenses (31%), with the remainder detained for drug offenses (11%), status offenses (9%) or other offenses (8%).

In the current study, in order to avoid any literacy difficulties, participants were administered a brief intelligence test and questionnaires were read to all participants. Consequently, youth obtaining a Standard Score of 65 or below ($n=13$) on the Peabody Picture Vocabulary Test (Dunn & Dunn, 1997) were excluded from the study, bringing the final number of participants to 88, ages 13 to 18 ($M = 15.57$, $SD = 1.28$).

Table 2
Demographic Variable Descriptive Statistics and Frequencies

	N	Min	Max	Mean	Std. Dev.	Percent
Age	88	13	18	15.57	1.28	
Grade	85	5	11	8.08	1.29	
PPVT (Standard Score)	88	66	123	85.60	13.50	
Family Income	86	\$19,768	\$80,895	\$37,732	\$12,886	
Ethnicity	88	African-American				68.2
		Caucasian				22.7
		Hispanic				4.5
		Native American				2.3
		Other				2.3
Current Offense	88	Property				40.9
		Violent				30.7
		Drug				11.4
		Status				9.1
		Other				8.0
Parent Marital Status	88	Never Married				40.9
		Divorced				24.1
		Currently Married				9.2
		Separated				3.4
		Widowed				2.3

(Table 2 continued)

Who Currently	88	Biological Mother Only	43.2
Live With		Biological Mother & Stepfather	25.0
		Other	11.4
		Biological Mother & Father	8.0
		Biological Father & Stepmother	8.0
		Biological Father Only	4.5
Psychiatric Med	88	Yes/No	19.3/80.7
Special Ed	88	Yes/No	51.1/48.9
MH Services	88	Yes/No	69.3/30.7
Mother Works	88	Yes/No	67.5/32.5
Father Works	88	Yes/No	80.0/20.0

Note. PPVT = Peabody Picture Vocabulary Test (Dunn & Dunn, 1997), Med = Medication; Ed = Education, MH = Mental Health.

Procedure

In the fall of 2004 and spring of 2005, this study was conducted along with two other projects, all of which were approved by the University of New Orleans' Institutional Review Board and the Director of L. Roberts Rivarde Memorial Home. An employee at Rivarde, Dr. John Ryals, contacted parents of youth at the facility. A graduate student researcher contacted those who agreed, and consent forms were read to parents over the phone and verbal consent was recorded. For those who gave verbal consent, a copy of the consent form was mailed to the parent. Following oral parental consent, and within the detention center setting, the research was described to the youth in order to obtain assent.

Overall, 126 families were contacted, 117 agreed to have their child participate, with 16 adolescents either declining or having been released prior to data collection. During a six-month period, 101 youths completed a packet of self-report questionnaires in small groups within the facility regarding their emotional development and aggressive behavior, in addition to more questionnaires for the other studies also being conducted. Total participation for each youth took approximately one hour for the questionnaire portion of the project. All identifying information was kept confidential, with all subjects classified with an identification number.

Measures

See Table 3 for a breakdown of constructs and measures.

Aggression. The Form and Function Aggression Scale (Marsee, Kimonis, & Frick, 2004) was used to measure reactive, proactive, and overall overt aggression. A number of measures have been developed to assess reactive, proactive, overt, and relational aggression (i.e., the Aggressive Behavior Rating Scale, the Direct and Indirect Aggression Scales);

Table 3
Constructs and Measures

- I. Aggression
 - a. Form and Function Aggression Scale
 - i. Overt proactive aggression
 - ii. Overt reactive aggression
- II. Socioemotional Competence
 - a. BarOn Emotion Quotient Inventory: Youth Version (Selected scales) & Psychosocial Maturity Inventory: Form D (Selected scales)
 - i. Identity
 - ii. Self-esteem
 - iii. Work orientation
 - iv. Communication skills
 - v. Empathy
- III. Emotion Regulation
 - a. Early Adolescent Temperament Questionnaire-Revised (Short Form)
 - i. Attention
 - ii. Inhibitory control
- IV. Negative Reactivity
 - a. Early Adolescent Temperament Questionnaire-Revised (Short Form)
 - i. Frustration
- V. Callous-Unemotional Traits
 - a. Inventory of Callous-Unemotional Traits

however, none of these measures include all four dimensions of aggression and those that include multiple dimensions only include a few items in each. Also, many of the existing aggression scales do not limit the items to acts harming another person and include many items that assess conduct problems in general (i.e., Brown, Atkins, Osborne, & Milnamow, 1996). First, all items assessing reactive, proactive, overt, and relational aggression from existing scales, including the Aggressive Behavior Rating Scale (Brown et al., 1996), the Aggressive Subtypes Scale (Dodge & Coie, 1987), the Direct and Indirect Aggression Scales (Bjorkqvist, Lagerspetz, & Osterman, 1992), and aggression scales created by Little and colleagues (Little, Jones, Henrich, & Hawley, 2003), Crick and Grotpeter (1995), and Galen and Underwood (1997) were pooled and items that were not clearly related to harming others were deleted. Second, items were reworded to ensure that there was direct correspondence between overt and relational items, such that for each overt reactive item there was an analogous relational reactive item, and for each overt proactive item, there was an analogous relational proactive item. These items were then reviewed to ensure that the wording was simplified and developmentally appropriate. This process led to the creation of the child report that includes ten items in each of the four categories, two of which were used in the current study: overt proactive (“I carefully plan out how to hurt others”) and overt reactive (“Sometimes I have hurt others when I am angry and I feel bad about it”). Mean scores were calculated, with higher scores indicating more aggression. Cronbach’s alphas were .76 for proactive aggression, .86 for reactive aggression, and .89 for overall overt aggression in the current study.

Socioemotional Competence. A questionnaire combining several scales from two measures, the BarOn Emotion Quotient Inventory: Youth Version, and the Psychosocial Maturity Inventory: Form D, totaling 44 items, was used to measure socioemotional competence

(Bar-On & Parker, 2000; Greenberger, 1984). The BarOn Emotion Quotient Inventory (EQI) is a self-report, measuring emotionally and socially intelligent behavior (Bar-On & Parker, 2000). Alphas for the EQI range from .73 to .90 for adolescents, indicating sufficient internal consistency (Bar-On & Parker, 2000). The items used from this measure came from the Interpersonal (communication skills), Intrapersonal (empathy), and General Mood (self-esteem) scales of the EQI. The Psychosocial Maturity Inventory (PSM) is also self-report, measuring the optimal growth of the individual, and attributes of individuals required to make a society function smoothly (Greenberger, 1984). Alphas for the PSM range from .70 to .82, indicating adequate internal consistency (Greenberger, 1984). The items used from this measure came from the identity, communication skills, and work orientation scales of the PSM. The combined measure was on a four-point Likert scale, from “Agree Strongly” to “Disagree Strongly,” with higher scores indicating better socioemotional competence. Example items from these measures used are: “I can’t really say what my interests are” (identity), “I like the way I look” (self-esteem), “I often don’t finish work I start” (work orientation), “People find it hard to figure me out from what I say” (communication skills), “I have trouble telling others about my feelings” (communication skills), and “I can tell when one of my close friends is unhappy” (empathy). Mean scores were calculated for each scale, with higher scores indicating better competence. For the current study, Cronbach’s alphas were .62 for communication skills, .65 for empathy, .74 for identity, .85 for self-esteem, and .71 for work orientation.

Emotion Regulation and Negative Reactivity. The Early Adolescent Temperament Questionnaire-Revised (Short Form) was designed to tap experiences common to adolescents to assess temperament and self-regulation (Capaldi & Rothbart, 1992; Ellis & Rothbart, 2001). To measure emotion regulation, the following scales totaling 11 items from the EATQ-R were used:

attention (e.g., “I find it hard to shift gears when I go from one class to another at school.”) and inhibitory control (e.g., “When someone tells me to stop doing something, it is easy for me to stop.”) To measure negative reactivity, the following scale totaling 7 items from the EATQ-R was used: frustration (e.g., “It really annoys me to wait in long lines” and “I get very upset if I want to do something and my parents won't let me.”) This measure is on a five-point Likert scale, from “Almost Always Untrue” to “Almost Always True.” Mean scores were calculated, with higher scores indicating better emotion regulation and poorer negative reactivity. Due to low Cronbach’s alphas indicating poor reliability in the current study, two items were removed from the Attention scale, and three items were removed from the Inhibitory Control scale. Consequently, the final Cronbach’s alphas for the current study were .59 for attention and .43 for inhibitory control. For the current study, Cronbach’s alpha for negative reactivity was .63, indicating adequate reliability within the sample.

Callous-Unemotional Traits. The Inventory of Callous-Unemotional Traits (ICU; Frick, 2004) is a 24-item self-report scale designed to assess callous and unemotional traits in youth. The ICU was derived from the CU scale of the Antisocial Process Screening Device (APSD; Frick & Hare, 2001). The CU component of the APSD has emerged as a distinct factor in both clinic and community samples (Frick, Bodin, & Barry, 2000) and has been shown to identify a distinct subgroup of children with conduct problems that are more severe than other children with conduct disorder (Christian, Frick, Hill, Tyler, & Frazer, 1997).

However, the self-report CU scale has demonstrated only moderate internal consistency in past studies (e.g., Loney et al., 2003) which is likely due to its small number of items ($n = 6$) and three-point rating system. Also, 5 out of the 6 items are worded in the same direction, increasing the possibility of response bias. The ICU was developed to overcome these

limitations. It was constructed based on a factor analysis of parent and teacher ratings on the APSD, using the four items that loaded significantly on the CU scale in both clinic-referred and community samples (Frick et al., 2000). These four items (“is concerned about the feelings of others,” “feels bad or guilty,” “is concerned about schoolwork,” and “does not show emotions”) were restructured into four positively and four negatively worded items and placed on a four-point scale (0 = “not at all true,” 1 = “somewhat true,” 3 = “very true,” and 4 = “definitely true”). Two items (“What I think is “right” and “wrong” is different from what other people think,” and “I do not let my feelings control me”) showed poor relations with the other items on the scale (corrected item total correlations were -.04 and -.27, respectively), and thus were removed. The ICU score was the sum of the remaining 22 items (reverse-scoring 12 of the items), with higher scores indicating high levels of CU traits. The scale showed adequate internal consistency for the current study (Cronbach’s alpha = .69).

Results

A moderate effect size was expected based on past research examining reactive and proactive aggression and various social and emotional outcomes within normal and delinquent samples (e.g., Prinstein et al., 2001; Vitaro et al., 2002), as well as research examining emotion regulation and behavior problems (e.g., Henry et al., 1996; Silk et al., 2003). Power analyses indicated that at a power of .80, the needed sample size to detect a moderate sized effect (e.g., .30) would be 23 participants in each group, therefore requiring approximately 69 participants total (Kirk, 1982).

Descriptive Statistics

The means, standard deviations, and frequencies for demographic variables are reported in Table 3. The means and standard deviations of the main study variables are reported in Table 4 and indicated sufficient variability on measures to detect hypothesized associations. Internal reliabilities using Cronbach's alpha for the socioemotional competence, negative reactivity, callous-unemotional traits and aggression scales, also included in Table 3, were calculated and it was determined that the measures were adequately reliable within this sample. The initial alphas for the emotion regulation scales were considerably low (e.g., .31 for attention and .13 for inhibitory control). Therefore, several items were removed from both scales, leaving three items for the attention scale with an alpha of .59 and three items for the inhibitory control scale with an alpha of .42.

The zero-order correlations among study variables are reported in Table 5. Most components of socioemotional competence were correlated in expected directions, except communication skills and empathy ($r = -.194$). However, this correlation was not significant ($p = .07$). For the socioemotional components, attention was significantly and positively correlated with only communication skills ($r = .251, p < .05$), while inhibitory control was significantly and positively correlated with all components except communication skills. Surprisingly, the two subscales for emotion regulation/effortful control (attention and inhibitory control) were negatively correlated with each other, although not significantly ($r = -.130, p = .228$). Therefore, these scales were not combined for an overall measure of emotion regulation but rather were kept separate for all analyses.

Table 4
Main Study Variable Descriptive Statistics

	N	Min	Max	Mean	Std. Dev.	Cronbach's α
Proactive Aggression	88	0.00	1.50	0.27	0.35	0.75
Reactive Aggression	88	0.00	2.90	1.04	0.66	0.86
Overt Aggression	88	0.00	2.00	0.65	0.46	0.89
Communication Skills	88	1.44	3.44	2.50	0.41	0.62
Empathy	88	1.80	4.00	3.20	0.53	0.65
Identity	88	1.70	4.00	2.94	0.57	0.74
Self-Esteem	88	1.77	4.00	3.40	0.51	0.85
Work Orientation	88	1.30	4.00	2.56	0.54	0.71
Attention	88	1.00	5.00	3.14	0.99	0.59
Inhibitory Control	88	1.33	5.00	3.78	0.76	0.43
Negative Reactivity	88	1.43	5.00	3.33	0.72	0.63
Callous-Unemotional Traits	88	6.00	45.00	25.68	7.75	0.69

Table 5
Main Variable Correlation Matrix

	Reactive Agg	Overt Agg	Comm Skills	Emp- athy	Identity	Self- Esteem	Work Orient	Attent	Inhib Control	Neg React	CU Traits
Proactive Aggression	.684**	.853**	-.130	-.161	-.250*	-.088	-.135	-.127	.007	.341**	.292**
Reactive Aggression	-	.964	-.121	-.128	-.338	-.215	-.134	-.145	-.014	.310	.326**
Overt Aggression		-	-.134	-.151	-.333*	-.186	-.145	-.149	-.008	.346**	.338**
Comm Skills			-	-.194	.476**	-.032	.464**	.251*	-.004	-.265*	-.021
Empathy				-	.280**	.468**	.165	-.057	.273*	.011	-.534**
Identity					-	.470**	.511**	.182	.256*	-.090	-.333**
Self- Esteem						-	.165	.053	.308**	.122	-.341**
Work Orientation							-	.108	.250*	-.142	-.312**
Attention								-	-.130	-.496**	-.006
Inhibitory Control									-	.309**	-.384**
Negative Reactivity										-	.012

(Table 5 continued)

Note. Agg = Aggression, Comm = Communication, Orient = Orientation, Attent = Attention, Inhib = Inhibitory, Neg React = Negative Reactivity, CU = Callous-Unemotional.

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

Reactive, proactive, and overall overt aggression were not significantly correlated with attention or inhibitory control. The only significant correlations among aggression and socioemotional competence were between both proactive and overall overt aggression and identity ($r = -.250, p < .05$; $r = -.333, p < .05$, respectively). As expected based on previous research, reactive and proactive aggression were significantly and positively correlated with each other ($r = .684, p < .01$). Negative reactivity was significantly correlated with attention in the expected direction ($r = -.496, p < .01$) but positively with inhibitory control ($r = .309, p < .01$). Negative reactivity was also significantly and positively correlated with proactive and overall overt aggression ($r = .341, p < .01$; $r = .346, p < .01$, respectively). CU traits were significantly negatively correlated with the components of socioemotional competence except communications skills, while negative reactivity was significantly negatively correlated with only communication skills ($r = -.265, p < .05$). CU was not correlated with negative reactivity or attention, but was significantly and negatively correlated with inhibitory control ($r = -.384, p < .01$). CU traits were also significantly and positively correlated with all forms of aggression ($r = .292, p < .01$ for proactive; $r = .326, p < .01$ for reactive; $r = .338, p < .01$ for overall overt).

Correlations among study variables and demographic variables are reported in Table 6. No significant correlations emerged. However, not surprisingly, youth age and school grade were positively significantly correlated ($r = .38, p < .01$). Additionally, family income and PPVT Standard Score were also significantly positively correlated ($r = .27, p < .05$).

Cluster Analysis and Group Formation

The formation of groups was determined by a k-means cluster analysis, performed on the standardized (converted to z-scores) ratings of overt reactive and proactive aggression.

Table 6
Demographics and Main Study Variable Correlation Matrix

	Age	Grade	PPVT	Income
Proactive Aggression	.115	.069	-.006	-.112
Reactive Aggression	.025	-.016	.016	.068
Overt Aggression	.060	.014	.009	.005
Communication Skills	-.107	-.026	.100	-.109
Empathy	.165	.113	.081	.033
Identity	-.192	.044	.145	-.020
Self-Esteem	.007	.084	-.053	.015
Work Orientation	-.097	-.107	.107	-.080
Attention	-.115	.045	.041	-.113
Inhibitory Control	-.040	-.036	.075	-.065
Negative Reactivity	-.034	.025	.042	-.076
Callous-Unemotional Traits	.037	-.052	-.010	.091
Age	-	.375**	-.012	-.077
Grade		-	.125	.021
PPVT (Standard Score)			-	.265*

Note. PPVT = Peabody Picture Vocabulary Test (Dunn & Dunn, 1997).

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

A two-stage approach was used to ascertain whether distinct types of aggressive groups could be identified based on the standard scores. The k-means cluster analysis is a non-hierarchical iterative-partitioning technique which aims to maximize distances between cluster centers while minimizing distances between cases within clusters, identifying the number of clusters that have the smallest ratio of within-group to between-group variance (Aldenderfer & Blashfield, 1988; Clark, Steer, Haslam, Beck, & Brown, 1997). In order to determine the optimal number of groups to be specified before analyses were computed, three groups were expected to emerge based on cluster analyses in previous research involving clinical and community samples (e.g., Kochenderfer-Ladd, 2003; Vitiello et al., 1990), specifically reactive only, reactive/proactive, and low-aggression. Therefore, a three-cluster solution was compared to a two-cluster solution, four-cluster solution, and five-cluster solution. Change in the cubic clustering criterion and expected overall R^2 are shown in Figures 2 and 3 for all four k-means cluster analyses. The cubic clustering criterion is an index that is based on the amount of variance explained by a cluster relative to the amount of variance that would be expected if the clusters were drawn from a random, uniform hyper-rectangular distribution. Based on these indices (i.e., fit statistics), the four-cluster solution was chosen because the expected overall R^2 (i.e., amount of variance explained by the cluster; Figure 3) and the cubic clustering criterion (Figure 2) increased significantly from the specified three- (.68 and 2.87) to four- (.77 and 5.35) cluster result, and a five-cluster solution ceased to account for significant reductions in within-cluster variation and resulted in a decrease in the cubic clustering criterion. Data were also sorted three times based on grade, whether the participant was on medication or not, and whether the participant was in special education or not, and the same clusters were obtained for all number solutions.

Figure 2
The Cubic Clustering Criterion for Aggression Group Cluster Iterations

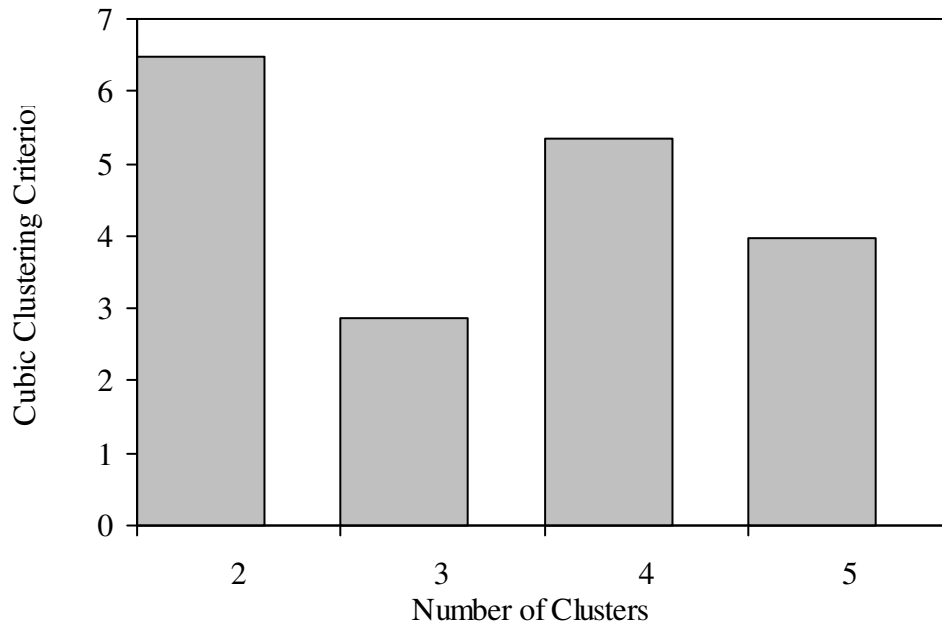
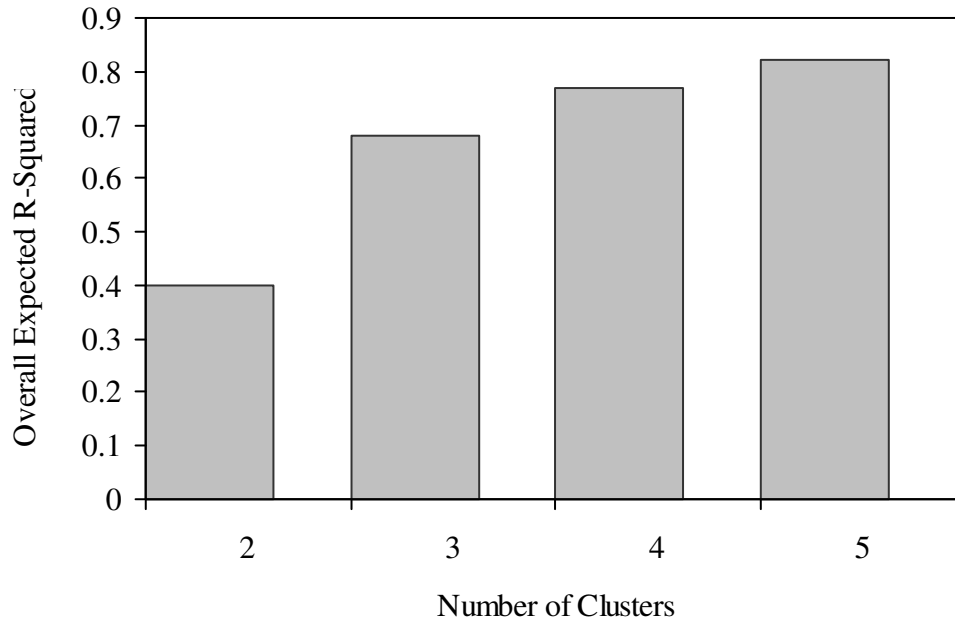


Figure 3
The Overall Expected R-Squared for Aggression Group Cluster Iterations



The four-cluster solution revealed a reactive only cluster (n=30), a low-aggression cluster (n=40), and two proactive/reactive clusters (n=5 and n=13). This solution resulted in a pseudo F statistic of 154.20 and expected overall R^2 of .77, indicating that the k-means cluster analyses had produced distinct types that adequately explained a large proportion of the covariation among the scores. However, examination of the cluster characteristics illustrated two mixed clusters that differed mostly in the severity of their aggression but were relatively high on both types. Based on the previous research cited above that three clusters are commonly found, these two mixed clusters were combined and a three-cluster solution was ultimately used. Additionally, one of the mixed clusters contained only five members, and no meaningful analyses could be performed with an n of that small size.

The final three clusters contained adolescents high on reactive aggression (n=30), adolescents high on both reactive and proactive aggression (n=18), and adolescents low on both reactive and proactive aggression (n=40). Means of the three groups on demographic variables are presented in Table 7. No significant differences were found on age, ethnicity, PPVT score, family income, special education placement, use of psychiatric medication, or history of violence. A one-way ANOVA revealed that the three groups differed on reactive and proactive aggression ($F(2,85) = 124.94, p < .01$; $F(2,85) = 90.28, p < .01$, respectively; see Table 8). Post-hoc comparisons using Tukey's HSD demonstrated that the reactive/proactive group had significantly higher means on both types of aggression than the reactive-only group, who had significantly higher means on both types of aggression than the low-aggression group.

Table 7
Aggression Group Means and Percentages for Demographic Variables (ANOVA and Chi Square)

	Low Aggression (n=40)	Reactive Only (n=30)	Reactive- Proactive (n=18)	<i>F</i> or χ^2 (2, <i>N</i> = 88)
Age	15.6	15.3	15.9	(2, 85) 1.48
PPVT Score	85.7	84.8	86.7	(2, 85) 0.10
Family Income	\$37625	\$39185	\$37733	(2, 83) 0.46
Minority	37.5%	26.1%	13.6%	1.78
Psychiatric Meds	8.0%	10.2%	1.1%	4.47
Special Education	20.5%	17.0%	13.6%	2.36
Violence History	23.9%	14.8%	12.5%	1.48

Note. PPVT = Peabody Picture Vocabulary Test (Dunn & Dunn, 1997); Meds = Medication.

Table 8
Aggression Group Means for Main Study Variables (ANOVA)

	Low Aggression (n=40)	Reactive Only (n=30)	Reactive-Proactive (n=18)	<i>F</i> (2, 85)
Proactive Aggression	.07a (0.11)	.21b (0.21)	.82c (0.31)	90.28**
Reactive Aggression	.45a (0.22)	1.36b (0.28)	1.85c (0.57)	124.94**
Attention	3.15 (0.93)	3.31 (1.05)	2.87 (1.02)	1.12
Inhibitory Control	3.79 (0.79)	3.72 (0.76)	3.89 (0.74)	.26
Negative Reactivity	3.14a (0.58)	3.20a (0.79)	3.96b (0.54)	10.58**
CU Traits	23.12a (7.27)	27.37ab (7.34)	28.55b (8.06)	4.45*
Communication Skills	2.54 (0.40)	2.54 (0.38)	2.39 (0.47)	1.01
Empathy	3.26 (0.52)	3.24 (0.51)	3.02 (0.57)	1.39
Identity	3.11a (0.53)	2.94a (0.59)	2.58b (0.48)	6.03**
Self-Esteem	3.53 (0.48)	3.30 (0.51)	3.31 (0.52)	2.25
Work Orientation	2.67 (0.53)	2.53 (0.57)	2.38 (0.46)	1.92

Note. CU = Callous-Unemotional. Standard deviations are in parentheses. Means with the same letters per row are not significantly different at the .05 level using Tukey's procedure for pairwise comparisons.

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

Test of Hypothesis 1

In order to test this hypothesis that attention, inhibitory control, negative reactivity, and callous-unemotional traits are related to type of aggression, a one-way ANOVA was performed comparing the three groups (reactive only, reactive/proactive, and low aggression; see Table 8). Contrary to the hypothesis that those in the reactive only group would report the lowest levels of emotion regulation, results showed that the three groups did not significantly differ on level of attention ($F(2,85) = 1.12, p = n. s.$) or inhibitory control ($F(2,85) = .26, p = n. s.$).

However, results showed that the three groups significantly differed on level of negative reactivity ($F(2,85) = 10.58, p < .01, \eta^2 = .20$) and CU traits ($F(2,85) = 4.45, p < .05, \eta^2 = .10$). Pairwise comparisons using Tukey's HSD revealed that the reactive/proactive group was significantly higher than the other two groups on negative reactivity, refuting the hypothesis that adolescents who exhibit only reactive aggression would exhibit the highest levels of negative reactivity. Pairwise comparisons using Tukey's HSD also revealed that the reactive/proactive group was significantly higher than only the low aggression group on CU traits, supporting the hypothesis that high levels of CU traits place a youth at risk for proactive and reactive aggressive behavior but contradicting the hypothesis that the proactive/reactive group would be significantly higher on CU traits when compared to both the reactive only group and the low aggressive group.

It was also hypothesized that when combining proactive and reactive aggression (due to their likely high correlation) for a level of overall overt aggression, adolescents high on overall overt aggression would display higher levels of negative reactivity and callous-unemotional traits, and lower levels of attention and inhibitory control than those with low levels of overall overt aggression. Results are reported in Table 9. Significant results supporting the hypotheses

Table 9
High and Low Overt Aggression Means for Main Study Variables (ANOVA)

	Low Overt (n=44)	High Overt (n=44)	<i>F</i> (1, 86)
Attention	3.20 (0.94)	3.10 (1.05)	.22
Inhibitory Control	3.76 (0.84)	3.82 (0.69)	.14
Negative Reactivity	3.11 (0.60)	3.55 (0.78)	8.80**
Callous-Unemotional Traits	23.16 (7.10)	28.20 (7.61)	10.32**
Communication Skills	2.54 (0.39)	2.48 (0.43)	.39
Empathy	3.30 (0.52)	3.11 (0.53)	2.99
Identity	3.12 (0.51)	2.77 (0.58)	9.06**
Self-Esteem	3.52 (0.47)	3.30 (0.53)	4.52*
Work Orientation	2.66 (0.51)	2.46 (0.55)	3.07

Note. Standard deviations are in parentheses.

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

emerged for negative reactivity ($F(1,86) = 8.80, p < .01, \eta^2 = .09$) and CU traits ($F(1,86) = 10.33, p < .01, \eta^2 = .11$), such that those with high levels of overall overt aggression reported significantly higher rates of negative reactivity and CU traits compared to those with low levels of overall overt aggression.

Test of Hypothesis 2

In order to test the hypothesis that different components of socioemotional competence are related to type of aggression, a one-way ANOVA was performed comparing the three groups (reactive only, reactive/proactive, and low aggression). Results showed that the three groups significantly differed only on identity ($F(2,85) = 6.03, p < .01, \eta^2 = .12$; see Table 8). Pairwise comparisons using Tukey's HSD revealed that the reactive/proactive group was significantly lower than the other two groups on identity. Contrary to hypotheses, no significant differences emerged for empathy based on group membership.

It was also hypothesized that when combining proactive and reactive aggression for a level of overall overt aggression, adolescents high on overt aggression would display lower levels of all components of socioemotional competence. Results are reported in Table 9. Significant results supporting the hypotheses emerged only for identity ($F(1,86) = 9.06, p < .01, \eta^2 = .10$) and self-esteem ($F(1,86) = 4.52, p < .05, \eta^2 = .05$) indicating that youth displaying high levels of overt aggression exhibit poor identity and poor self-esteem.

Test of Hypothesis 3

In order to test the hypothesis that adolescents exhibiting both high levels of CU traits and high levels of aggression would report the lowest levels of empathy, and that those exhibiting high levels of aggression, a 2x2 between-subjects ANOVA was performed on attention, inhibitory control, negative reactivity and socioemotional competence with two levels

of CU traits and two levels of overall overt aggression (i.e., high and low using median split). Results of the ANOVA are reported in Table 10. Significant main effects emerged for aggression with identity ($F(1,84) = 7.56, p < .01$) and negative reactivity ($F(1,84) = 8.45; p < .01$), indicating that regardless of level of CU traits, those exhibiting high levels of aggression display lower levels of identity formation and higher levels of negative reactivity. Other significant main effects emerged for CU traits with inhibitory control ($F(1,84) = 9.23, p < .01$), empathy ($F(1,84) = 17.70, p < .001$), self-esteem ($F(1,84) = 5.17, p < .05$), and work orientation ($F(1,84) = 4.80, p < .05$). These results indicate that, regardless of level of aggression, adolescents who exhibit higher rates of CU traits display lower levels of inhibitory control, and lower levels of empathy, self-esteem, and work orientation. These main effects support the results found among the zero-order correlations. Additionally, a significant interaction emerged between CU traits and aggression for empathy as hypothesized ($F(1,84) = 8.12, p < .01$). Post-hoc comparisons using Tukey's HSD demonstrated that those exhibiting high levels of both aggression and CU traits displayed significantly lower means on empathy than other group combinations of low and high on CU traits and aggression. This interaction is graphed in Figure 4.

In order to test the hypothesis that youth with high levels of negative reactivity would report the lowest levels of emotion regulation and low levels of the four remaining components of socioemotional competence, a 2x2 between-subjects ANOVA was also performed on attention, inhibitory control, callous-unemotional traits and socioemotional competence with two levels of negative reactivity and two levels of overt aggression (i.e., high and low using median split). Results of the ANOVA are reported in Table 11. Significant main effects emerged for aggression with CU traits ($F(1,84) = 10.32, p < .01$), identity ($F(1,84) = 9.48, p < .01$), and self-esteem ($F(1,84) = 6.09, p < .05$), indicating that regardless of level of negative reactivity, those

Table 10

2x2 ANOVA for Level of Overt Aggression and Callous-Unemotional Traits on Study Variables

	Low Overt Aggression		High Overt Aggression		Effects
	Lo CU (n=29)	Hi CU (n=15)	Lo CU (n=20)	Hi CU (n=24)	
Communication Skills <i>SD</i>	2.52 (0.41)	2.57 (0.35)	2.48 (0.43)	2.48 (0.44)	
Empathy <i>SD</i>	3.35 (0.52)	3.21 (0.53)	3.50 (0.35)	2.78 (0.43)	CU ^a CUxAgg ^b
Identity <i>SD</i>	3.14 (0.54)	3.08 (0.46)	2.97 (0.53)	2.60 (0.58)	Agg ^c
Self-Esteem <i>SD</i>	3.55 (0.48)	3.47 (0.44)	3.51 (0.41)	3.11 (0.55)	CU ^d
Work Orientation <i>SD</i>	2.71 (0.50)	2.57 (0.52)	2.66 (0.52)	2.30 (0.54)	CU ^e
Attention <i>SD</i>	3.15 (0.95)	3.29 (0.95)	3.05 (1.08)	3.14 (1.03)	
Inhibitory Control <i>SD</i>	3.87 (0.75)	3.53 (0.97)	4.17 (0.63)	3.53 (0.62)	CU ^f
Negative Reactivity <i>SD</i>	3.12 (0.56)	3.09 (0.70)	3.61 (0.82)	3.50 (0.74)	Agg ^g

Note. CU = Callous-Unemotional Traits, Agg = Aggression.

^a $F(1,84) = 17.70, p < .001$; ^b $F(1,84) = 8.12, p < .01$; ^c $F(1,84) = 7.56, p < .01$; ^d $F(1,84) = 5.17, p < .05$; ^e $F(1,84) = 4.80, p < .05$; ^f $F(1,84) = 9.23, p < .01$; ^g $F(1,84) = 8.45, p < .01$.

Figure 4

The Interaction between Callous-Unemotional (CU) Traits and Aggression for Empathy

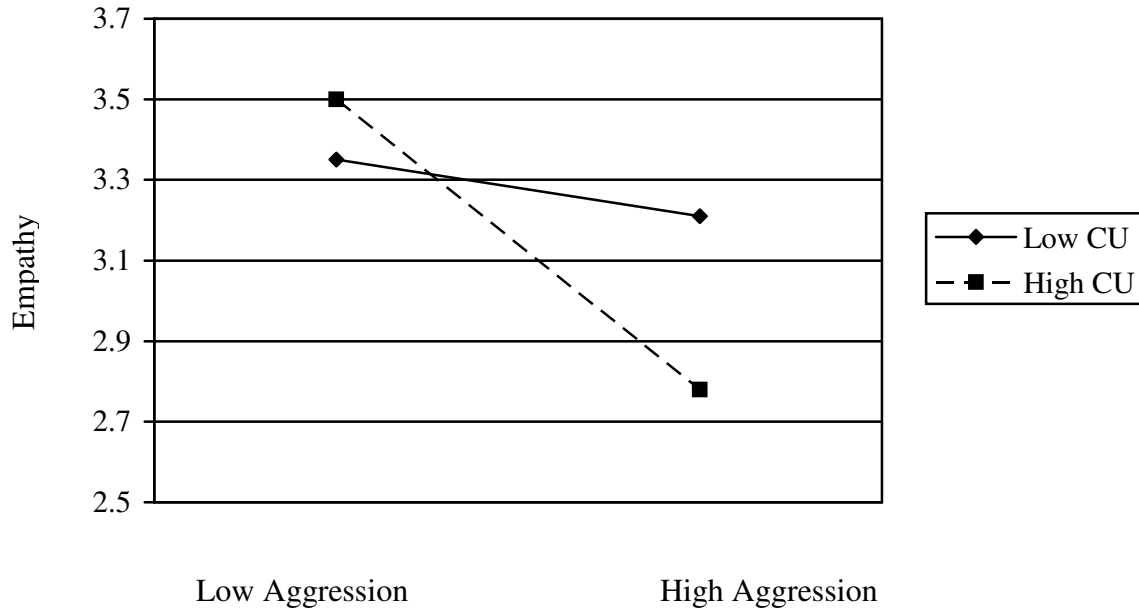


Table 11

2x2 ANOVA for Level of Overt Aggression and Negative Reactivity on Study Variables

	Low Overt Aggression		High Overt Aggression		Effects
	Lo NR (n=28)	Hi NR (n=16)	Lo NR (n=18)	Hi NR (n=26)	
Attention <i>SD</i>	3.43 (0.94)	2.79 (0.83)	3.54 (0.79)	2.79 (1.10)	NR ^a
Inhibitory Control <i>SD</i>	3.56 (0.95)	4.10 (0.42)	3.54 (0.71)	4.01 (0.62)	NR ^b
CU Traits <i>SD</i>	22.96 (6.06)	23.50 (8.85)	29.72 (8.74)	27.15 (6.71)	Agg ^c
Communication Skills <i>SD</i>	2.57 (0.38)	2.47 (0.41)	2.51 (0.50)	2.46 (0.38)	
Empathy <i>SD</i>	3.27 (0.56)	3.36 (0.44)	3.10 (0.60)	3.11 (0.50)	
Identity <i>SD</i>	3.10 (0.50)	3.16 (0.54)	2.69 (0.62)	2.82 (0.56)	Agg ^d
Self-Esteem <i>SD</i>	3.47 (0.52)	3.62 (0.35)	3.16 (0.48)	3.39 (0.55)	Agg ^e
Work Orientation <i>SD</i>	2.69 (0.55)	2.61 (0.45)	2.42 (0.60)	2.49 (0.53)	

Note. NR = Negative Reactivity, Agg = Aggression, CU = Callous-Unemotional Traits.

^a $F(1,84) = 11.03, p < .01$; ^b $F(1,84) = 10.02, p < .01$; ^c $F(1,84) = 10.32, p < .01$; ^d $F(1,84) = 9.48, p < .01$; ^e $F(1,84) = 6.09, p < .05$.

exhibiting high levels of aggression display lower levels of identity formation and self-esteem, and higher levels of CU traits. Other significant main effects emerged for negative reactivity with attention ($F(1,84) = 11.03, p < .01$) and inhibitory control ($F(1,84) = 10.02, p < .01$), indicating that regardless of level of aggression, those exhibiting high levels of negative reactivity display lower levels of attention and higher levels of inhibitory control. These main effects also supported the results found among the zero-order correlations. No significant interactions emerged as hypothesized.

Discussion

The primary focus of this study was to examine the relationships between type of aggressive behavior and emotion regulation, negative reactivity, callous-unemotional traits, and socioemotional competence. It was predicted that in a sample of adolescent delinquent boys, three groups would emerge based on the type of aggression exhibited: a low aggression group, a reactive aggression only group, and a mixed proactive and reactive aggression group. Although proactive and reactive aggression were highly correlated, four groups emerged based on a series of k-means cluster analysis: two mixed proactive and reactive aggression groups of differing severities, a reactive aggression only group, and a low aggression group. The two mixed aggression groups were combined to create a single proactive/reactive aggression group. The three-group classification is consistent with previous research (Dodge et al., 1997) specifying the predicted three-group distinction that did not include a group high on proactive aggression only.

Differences were found for the three groups, with similar patterns emerging when combining proactive and reactive aggression groups. Youth high in overall overt aggression, both proactive and reactive, suffered from lower identity formation/self-concept and lower self-

esteem, but not other components of socioemotional competence as expected. These results support previous findings indicating that an under-developed or negative identity place an adolescent at risk for aggressive behavior (Benjamin, 2001; Moretti, Holland, & McKay, 2001), and previous research linking high levels of aggression with low levels of self-esteem (Donnellan et al., 2005; Frankel & Myatt, 1996; Sutherland & Shepherd, 2002). Results also show that youth who are high in overt aggression experience higher levels of negative reactivity, as well as higher levels of callous-unemotional traits.

The constructs of CU traits and negative reactivity emerged as important factors to consider in examining patterns of aggression and socioemotional competence. The results of the current study support previous findings relating high levels of CU traits to low levels of empathy and high levels of overt aggression, both proactive and reactive (Blair, 1999; Christian et al., 1997; Cohen & Strayer, 1996; Frick, et al., 1999; Kaukiainen et al., 1999; Pardini, Lochman & Frick, 2003), placing adolescent offenders at an even greater risk for future violent antisocial behavior (Jolliffe & Farrington, 2004). Deficiencies in self-esteem were also characteristic of those high in callous-unemotional traits, as was work orientation. While previous research has linked poor self-esteem, poor work orientation, and callous-unemotional traits with aggression (Barry et al., 2003; Brier, 1995; Connor, 2002; Davis et al., 1999; Frick et al., 2003), this is one of very few studies to link poor self-esteem and poor work orientation specifically with high levels of callous-unemotional traits. Interestingly, high levels of CU traits were also significantly related to low levels of inhibitory control, somewhat supporting previous research indicating that individuals who are callous and unemotional are often characterized by high levels of impulsive behavior (Frick & Morris, 2004). The hypothesis that lower levels of empathy would be related to proactive aggression was not confirmed in the initial analyses involving the aggression

groups; however, when examining overall overt aggression, those with high levels of overt aggression in addition to high levels of CU traits emerged with the lowest levels of empathy.

Adolescents high in negative reactivity also reported higher levels of overt aggression, as well as lower identity. These results support previous findings suggesting that individuals high in negative emotional reactivity are often highly aggressive and have difficulty with identity formation (Lavallee & Campbell, 1995; Shields & Cicchetti, 1998). While those high in negative reactivity were also found to be high in CU traits, the two variables were not correlated in the current study, suggesting that more research is needed to examine their complex relationship. However, these findings indicate that adolescents with emotional difficulties as evidenced by high levels of CU traits and high levels of negative reactivity are at risk for high levels of aggression and deficits in certain aspects of socioemotional competence (i.e., empathy, self-esteem, identity, work orientation), which in turn place them at risk for future conduct problems and offending (Dadds, Fraser, Frost, & Hawes, 2005; Frick et al., 2003).

High levels of negative reactivity were also found to be related to low levels of attention, supporting previous research linking negative emotionality with components of emotion dysregulation (Caspi et al., 1997; Rothbart et al., 1994). However, high levels of negative reactivity were found to be related to high levels of inhibitory control. While this does not support previous research, these results must be interpreted with caution as the current measure of emotion regulation was not proven highly reliable within the sample as evidenced by their poor alphas and negative correlation between the two scales. As a result, it is not surprising that the main hypotheses regarding emotion regulation were not confirmed. Indeed, although discrete aggression groups were able to be delineated in the current sample, the distinction between

reactive and proactive aggression failed to reveal significant findings for emotion regulation. Specifically, adolescent offenders who exhibited predominantly reactive aggression did not display lower levels of attention and inhibitory control when compared to those who exhibited high and low levels of both proactive and reactive aggression. Hypothesized findings also failed to emerge for emotion regulation when combining proactive and reactive aggression for an overall overt aggression score. However, it is too soon to disregard the hypotheses, as there are indications to support the relationship between emotion regulation and aggression (see Orobio de Castro, 2005), and findings from the current study indicate strong associations between negative emotionality and aggression.

In the current study, the Early Adolescent Temperament Questionnaire (EATQ), the measure of emotion regulation, did not provide acceptable results in terms of reliability for the two scales of attention and inhibitory control. It is unclear whether the wording of the items was difficult for the participants to understand or whether a different measure entirely would have been more appropriate (e.g., observational measures). Because the two scales were negatively correlated, they could not be combined as has been done in previous studies that have used this measure (Eisenberg, Fabes, & Shepard, 1997), which also may have affected the results found in the current study. Additionally, the EATQ was developed as a measure of temperament, and some may argue that emotion regulation was not actually measured in this study, but merely aspects of adolescents' temperament (i.e., attention and inhibitory control; Cole, Martin & Dennis, 2004). While the subscales used in this study have frequently been used in emotion regulation research (Eisenberg et al., 1997; Morris, Silk, & Steinberg, 2002), there has also been support for individual observational measures of emotion regulation (Eisenberg et al., 2001), as

well as peer interaction observations (see Hubbard & Coie, 1994), noting that peers have been shown to strongly influence delinquent behavior in boys (Galbavy, 2003; Parker & Asher, 1987).

Although this study was unique in its examination of emotional development in a delinquent sample, there exist weaknesses to address in future research. The sample consisted of primarily African-American males from a southern United States urban population. The current investigation relied solely on self-report of all indices, presenting an important limitation due to the overall Low Average IQ of the sample. These questionnaires have not been validated using a delinquent sample, as evidenced by the poor reliability scores obtained on the measure of emotion regulation. It is possible that the adolescents in the current sample lacked the aptitude to adequately comprehend the questions and scales. Or, the adolescent may have lacked adequate insight or psychological-mindedness in order to answer questions about their own social and emotional development. No other data, such as parent report, was obtained to corroborate the self-report questionnaires. Also, a control group would have provided vital information regarding normative levels of study variables in order to compare with the offender sample.

Additionally, it is imperative in future studies to also employ physiological measurement when examining emotion regulation and reactivity. In the current study, negative reactivity was positively correlated with proactive aggression, contradicting previous research linking proactive aggression with lower levels of negative reactivity and reactive aggression with higher levels of reactivity (Hubbard et al., 2004; Scarpa & Raine, 1997). However, previous studies have also shown that some children who exhibit proactive aggression may report high levels of reactivity but their physiological response indicates low reactivity as evidenced by lower heart rates and skin conductance levels (Hubbard et al., 2002). Additionally, as reported, proactive and reactive aggression are correlated, therefore it is not surprising that proactive youth are also highly

reactive. It is also important to measure the presence of CU traits, as high levels have been linked to psychophysiological underarousal, regardless of type of aggression exhibited (Loney et al., 2003).

One of the most important findings in the current study is the lack of support for using a proactive and reactive aggression distinction, a sentiment put forth by Bushman and Anderson (2001). Although there exists a great deal of evidence supporting the existence of these two separate types of aggression (Vitaro et al., 1998, 2002), they are often highly correlated, as in the current study. Current findings also suggest that they do not differentially predict the variables examined. Results indicate that difficulties in identity, self-esteem, empathy, and reactivity in adolescent offenders are characteristic of overall overt aggression, be it reactive or proactive. Additionally, Orobio de Castro and colleagues (2005) found that emotion regulation in a sample of at-risk pre-adolescent boys was negatively related with both reactive and proactive aggression. The current study also hypothesized that the proactive/reactive distinction would identify the combined group as having higher levels of CU traits when compared to the reactive only and low aggression groups. However, the proactive/reactive and reactive only groups did not significantly differ on level of CU traits. A possible explanation for this is that the reactive only group was not purely reactive, reporting low levels of proactive aggression that were higher than those for the low aggression group. In fact, previous studies have decided membership for the proactive/reactive group requires any use of proactive aggression, even if it is only one instance, and have found low levels of CU traits in a purely reactive group (e.g., Cornell et al., 1996). Interestingly, in light of these results, we were unable to fully confirm the comparison between proactive/reactive aggression groups, and this calls into question evidence for proactive aggression as an indicator of early-onset conduct problems. While those high in both types of

aggression displayed poorer adjustment when compared to those low in aggression, there were no meaningful differences between those who displayed only reactive aggression and those who displayed both types. However, the presence of CU traits was able to denote significant difficulties different from the difficulties shown in those high in overt aggression, including lower self-esteem, work orientation, empathy, and inhibitory control. Therefore, it is likely that future studies will have more success if examining overall overt aggression and CU traits rather than proactive and reactive aggression.

While the hypotheses regarding the proactive/reactive distinction were not confirmed, other interesting findings were detected examining overall overt aggression, CU traits, negative reactivity, and elements of socioemotional competence. It is important for future researchers to address the limitations of the current study in order to build on the current findings as this line of research has important implications for treating juvenile delinquent behavior. Specifically, while many successful intervention programs exist addressing the role of the family and individual cognitive and behavioral aspects of aggressive and antisocial behavior in adolescents (see Connor, 2002), few address the emotional aspects, and, thus, adolescent aggression and offending remain high. Also, although parent training techniques alone using social learning models have been shown to work well with younger, less severe aggressive children (McMahon & Wells, 1998), more is needed when treating older, more severe offenders. The current findings suggest that adolescent offenders with high rates of overt aggression and callous-unemotional traits would benefit from treatments that address improving their self-concept and self-esteem through increased social skills and involvement in prosocial peer activities; decreasing negative emotional reactivity through anger management training; and empathy training involving effective social perspective taking and rewards for behaviors that do not violate the rights of

others like violence and aggression. However, in order to determine if the relationships among variables found in the current study could inform *prevention* efforts, more research is needed on a younger at-risk population prior to delinquent and illegal behavior examining these relationships, as is currently being done by Frick and colleagues (Frick & Morris, 2004). Indeed, by identifying the many risk factors of aggressive children, and by becoming more skilled in understanding the complex interplay among developmental and contextual factors in the etiology of aggressive and antisocial behavior, we can design conceptual models that facilitate the assessment and treatment of these adolescents (McMahon & Wells, 1998).

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Appendix

IRB Approval Form

University Committee for the Protection
of Human Subjects in Research
University of New Orleans

Form Number: 04oct04-r

(please refer to this number in all future correspondence concerning this protocol)

Principal Investigator Kimonis, Munoz, Aucoin Title: Graduate Student

Faculty Supervisor: Paul Frick (if PI is a student)

Department: Psychology College: Science

Project Title: Emotional adjustment in adjudicated boys

Date Reviewed:

Dates of Proposed Project Period From 10/01/04 to 08/31/05

**approval is for one year from approval date only and may be renewed yearly.*

Note: Consent forms and related materials are to be kept by the PI for a period of three years following the completion of the study.

Approval Status

Date

Full Committee Approval

Expedited Approval

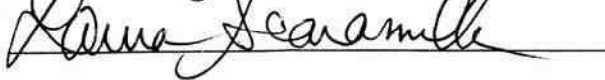
Continuation

Rejected

The protocol will be approved following receipt of satisfactory response(s) to the following question(s) within 15 days:


11-17-04

Committee Signatures:



Laura Scaramella, Ph.D. (Chair)

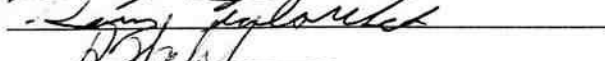
Pamela Jenkins, Ph.D.



Anthony Kontos, Ph.D.




Richard B. Speaker, Ph.D.



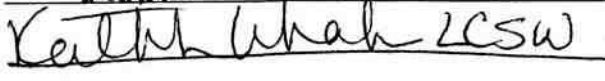
Gary Talarchek, Ph.D.



Kari Walsh



L. Allen Witt, Ph.D.



Kathleen Whalen, LCSW

Vita

Katherine Aucoin was born in New Orleans, LA and received her B.A. from Loyola University in New Orleans with a major in Psychology. Following her undergraduate education, Ms. Aucoin worked as grant coordinator for Dr. Paul Frick at the University of New Orleans and as a research associate for Dr. Joy Osofsky at LSU Health Sciences Center. She began the Applied Developmental Psychology program at the University of New Orleans in August, 2001 where Ms. Aucoin earned her M.S. in 2003. She also worked with Dr. Jill Hayes Hammer in the area of forensics and neuropsychology. Ms. Aucoin is currently employed as a Developmental Psychologist with Jefferson Parish Human Services Authority in Louisiana working with children and adolescents.