

**Predicting Reactive and Proactive Relational Aggression in Early Adolescence as a
Function of Individual Differences in Machiavellianism, Empathy, and Emotion
Regulation**

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Abstract

Relational aggression encompasses behaviour meant to hurt others by destroying their friendships and reputation (Crick & Grotpeter, 1995). As peer relationships take on greater importance in early adolescence, relational aggression becomes more accepted and prevalent, yet perceived as equally or more harmful to its targets than physical aggression. The present study explored whether reactive and proactive subtypes of relational aggression were associated with an inability to empathize with others, regulate emotional states, and hold attitudes that it is acceptable to manipulate and harm others. Empathy, emotion regulation, and Machiavellianism's roles in predicting reactive and proactive relational aggression was examined using Crick and Dodge's (1994) reformulated Social Information-Processing Theory's framework. Reactive relational aggression was expected to be associated with low empathy and high emotion dysregulation. Proactive relational aggression was expected to be predicted by high empathy, low emotion dysregulation, and high Machiavellianism. Low empathy was expected to predict overt aggression indices. One hundred and thirty-three children (73 females, 60 males, $M_{age} = 12.84$ years) in grades 6 through 8 from five schools in a public Ontario schoolboard were recruited. Caregivers completed a measure of their child's emotions and behaviours (The Emotion Regulation Checklist; Shields & Cicchetti, 1995). Participating students completed four self-report measures assessing relational and overt aggression (Children's Social Behaviour Scale – Self-Report; Crick & Grotpeter, 1995), proactive and reactive subtypes of aggression (Little, Jones, Henrich, & Hawley, 2003), empathy (Interpersonal Reactivity Index; Davis, 1980), and Machiavellianism (Kiddie Mach Scale; Christie & Geis, 1970) during one 60 minute session. Empathy, Machiavellianism, and emotion dysregulation scores were associated with total, reactive, and

proactive relational aggression scores. When contrasting subtypes of aggression were controlled, however, these emotional and cognitive variables did not predict total and reactive relational aggression. There was a non-significant trend for higher levels of empathy to predict proactive relational aggression. Low empathy significantly predicted total and reactive overt aggression indices. Machiavellianism predicted reactive and proactive overt aggression. Emotion regulation was not a significant predictor in analyses. Results provide support for the role of Machiavellianism and empathy in relational aggression, particularly proactive or goal-oriented instances.

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An Introduction to Aggression

Aggression has been defined as behaviour intentionally aimed at harming another person (Dodge, 1991). Research on the origins of this behaviour suggests that human beings have a genetic predisposition towards aggressive acts, and that this predisposition is further influenced by experience (Tremblay & Nagin, 2005). Twin studies support the idea of a relatively equal accounting of variance in aggression by genetic and environmental factors (e.g., Dionne, Tremblay, Boivin, LaPlante, & Perusse, 2003). Genetically based factors such as gender and early “difficult” temperament qualities (e.g., negative emotionality) have been associated with aggressive behaviours both concurrently and into the future (Rubin, Burgess, Hastings, & Dwyer, 2003; Shaw, Owens, Giovannelli, & Winslow, 2001). In contrast, environmental factors such as parents’ modeling of interaction patterns appear to have a special significance for the emergence of aggression in their children. For instance, interparental conflict strategies (Underwood, Beron, Gentsch, Galperion & Risser, 2008) and parental attributions about aggressive behaviour (Johnston & Ohan, 2005) are thought to be important determinants of childhood aggression. Parents of aggressive children are more directive, commanding, and authoritarian than parents of non-aggressive children. The families of aggressive children are often characterized by inconsistent discipline, lack of parental involvement, lack of warmth in parent-child exchanges (e.g., Pfiffner, McBurnett, Rathouz & Judice, 2005), and coercive family processes (Patterson, 1982; Patterson, 2002). Further familial determinants of higher levels of aggression include such maternal variables as depressed mood, younger age at the birth of a child, and maternal hostility towards the child (Romano, Tremblay, Boulerice & Swisher, 2005).

Negative Consequences of Aggressive Behaviour

A number of negative psychosocial and societal consequences have been consistently associated with aggression. Aggressive behaviours in children are associated with diverse indicators of maladjustment, such as anxiety, depression, emotion dysregulation, and attentional difficulties (Card, Stucky, Sawalani, & Little, 2008). Research has also documented the wide-reaching socioeconomic and health consequences of aggressive behaviour. For example, childhood aggression has been found in longitudinal studies to be predictive of low family income, poor health outcomes, and more frequent use of health services in adulthood (Serbin et al., 2011; Temcheff et al., 2011).

While the variety of negative outcomes linked to the use of aggression in general is beyond the scope of this paper, what does appear to be key among the consequences of using aggression as a social strategy is peer rejection (Crick, Ostrov, & Werner, 2006). The interpersonal skills developed in early childhood social interactions (e.g., prosocial skills, conflict resolution, emotion regulation, and empathy) are often carried into early adolescence and beyond (Ostrov & Godleski, 2007). Aggressive children tend to associate with deviant peers (Alvarez & Ollendick, 2003), and when they are already classified by their non-aggressive peers as disruptive, and are consequently rejected, they may then not have adequate opportunities to learn or refine important prosocial skills. Indeed, studies have shown that many children who are perceived by their peers as more aggressive and disruptive are low in popularity (Hymel, Rubin, Rowden & LeMare, 1990). Low peer acceptance and peer rejection, in turn, have been associated with more instances of internalizing and externalizing difficulties in aggressive children (Card, Stucky, Sawalani & Little, 2008). On the other hand, it should be noted that not all aggressive children appear to

have deficits in social skills, or are unpopular among their peers (e.g., Andreou, 2006; Cillessen & Mayeux, 2004; Hawley, Little, & Card, 2007). Children who are perceived as popular, but not particularly well-liked by peers can be socially intelligent and dominant aggressors, with high degrees of social status, impact, and visibility (Coie, Dodge, & Coppotelli, 1982; Xie et al., 2002). Developmental psychologists have documented aggression being used in children as young as 3 years of age as a potentially effective, efficient strategy for gaining compliance and victory in interpersonal conflicts (Pellegrini et al., 2007).

Individual Differences and Aggression

While most children can and probably do aggress against others at times, not all do so in the same manner or with similar regularity. In addition to the importance of family dynamics, peer relationships, and socioeconomic factors, the evidence for individual differences in aggressive children is abundant. Research on such individual differences suggests the importance of numerous intrapersonal characteristics that correlate with aggression. These include: intellectual difficulties (e.g., learning disabilities and low IQ; Giancola et al., 1996); hostile attributional biases (i.e., the tendency to attribute hostile intentions to others' ambiguous behaviours in social situations; Crick & Dodge, 1996); difficulty attending to social cues (Salmivalli & Nieminen, 2002); deficient problem-solving skills (Warden & MacKinnon, 2003); and empathy deficits (Jolliffe & Farrington, 2004), to name but a few (see Alvarez & Ollendick, 2003 for a review).

The beliefs, attitudes, and values that individuals develop during childhood contribute to their propensity for aggressive behaviour. Studies have found that inflated, unstable and defensive self-esteem (i.e., narcissism), and feelings of being "better off" (i.e., having more

power) than others, predict higher levels of aggression (Baumeister et al., 2009; Muller, Bushman, Subra, & Ceaux, 2012; Sandstrom & Jordan, 2008). Individual cognitive predictors of future aggression include self-efficacy and positive outcome beliefs related to using aggression, positive appraisals of and attitudes towards the use of aggression in response to provocations (e.g., taunts and personal insults), and valuing aggression as an acceptable approach to resolving interpersonal conflict (Anderson & Bushman, 2002). Clearly, the role of individual differences in a large number of possible variables - including those in social, emotional, and cognitive domains - become important in understanding what makes someone more likely to engage in aggressive behaviour.

Functions and Forms of Aggression: Examining Classification Subtypes

Proactive aggression and reactive aggression. In an effort to better account for individual differences in aggression, researchers have increasingly distinguished several subtypes of this behaviour. One method of subtyping focuses on the “function” of aggression. It distinguishes proactive aggression, which is the use of aggressive behaviour directed by a goal and in anticipation of a reward, from reactive aggression, which involves the use of aggressive responses to deal with provocations or threats (Dodge, 1991; Kempes, Matthys, de Vries, & van Engeland, 2005; Mayberry & Espelage, 2007). While proactive aggression clearly has a deliberate function, reactive aggression is more of a spontaneous, emotionally-driven retaliatory behaviour that is not planfully chosen. The concept of reactive aggression has its roots in the frustration aggression hypothesis (Berkowitz, 1963), which states that the frustration resulting from goals blocked by internal or external factors triggers hostility, anger and the impulse to behave aggressively (Polman, Orobio de Castro, Koops, van Boxtel, & Merk, 2007). In comparison, proactive aggression’s theoretical ties lie with

Bandura's (1973) social learning theory, where it is presumed that proactive aggression is primarily learned by way of observing and imitating social models (Polman et al., 2007).

Factor analyses have demonstrated that reactive and proactive aggression are distinct, yet strongly correlated, constructs (Salmivalli & Nieminen, 2002). Although there is significant overlap between the two, with average correlations ranging from $r = .64$ to $.68$ in recent meta-analyses (Mathieson & Crick, 2010), substantial empirical support exists for their distinctiveness (Ostrov & Houston, 2008). For instance, reactive aggression and proactive aggression have different test-retest stabilities (e.g., Camodeca, Terwogt, & Schuengel, 2002; McAuliffe, Hubbard, Rubin, Morrow, & Dearing, 2007). Parental ratings of reactive and proactive aggression demonstrated that reactive aggression decreased in children between childhood (9-10 years) and early adolescence (11-14 years), whereas mean levels of proactive aggression remained stable (Tuvblad, Raine, Zheng, & Baker, 2009). Individual differences for both reactive and proactive aggression, however, showed moderate stability over time. This suggests that, while in overall samples reactive aggression decreases and proactive aggression remains stable over development, an individual child's level of reactive or proactive aggression remains relatively constant. Twin study findings on the heritability of different functions of aggression suggest that, for males only, genetic influences contribute more to proactive aggression than to reactive aggression, with 50% versus 37% estimates of heritability, respectively (Baker, Raine, Liu, & Jacobson, 2008). Female scores for reactive and proactive aggression showed almost no evidence of heritability, and were nearly entirely accounted for by shared and non-shared environmental influences (Baker et al., 2008). These findings suggest that, with regards to the subjective

reasons that children report for aggressing against others, the primary pathway by which these distinct functions develop differs depending upon gender.

Aside from the aggressor's gender, literature suggests that reactive and proactive aggressors appear to have different associated skills and personal characteristics. For instance, reactive aggression but not proactive aggression is associated with observably weak inhibitory functions and increased impulsivity (Raine et al., 2006). Children who aggress reactively demonstrate patterns of social information processing that include hostile attribution biases (Crick & Dodge, 1996; Dodge & Coie, 1987). Conversely, proactive aggression appears more typical of individuals who are socially skilled and capable of effectively manipulating others to harm a target. These goals are often accomplished by proactive aggressors while they maintain positive peer relationships, and these individuals are likely to successfully conceal their negative intentions from others (Salmivalli & Nieminen, 2002). Proactive aggression also seems to be driven by positive expectancies of the effectiveness of aggression as a social strategy (Crick and Dodge, 1996; Dodge, Lochman, Harnish, Bates, & Petit, 1997; Polman et al., 2007).

Both proactive and reactive subtypes of aggression have some distinct negative psychosocial outcomes as well. Reactive aggression is typically associated with a diverse array of features such as negative mood and poor behavioural and social outcomes. Card and Little (2006) found that reactive aggression after controlling for proactive aggression was significantly related to numerous indices of poor psychosocial adjustment, such as internalizing problems, low peer acceptance, ADHD symptoms, delinquency, victimization, low prosocial behaviour, low social preference, and peer rejection. In contrast, proactive aggression after controlling for reactive aggression was only associated with delinquency and

peer rejection, but was also related to lower levels of victimization, indicating higher comparative levels of social adjustment (Card & Little, 2006). In other words, reactively aggressive children are at risk for a broader range of both mental health and social consequences than are proactively aggressive children.

Physical aggression and relational aggression. Researchers have defined a second dimension of aggressive behaviour that focuses on the “form” of aggression. This classification differentiates physical aggression - which is overt, also known as direct aggression, and primarily involves hitting, pushing, kicking, and otherwise physically harming another individual - from relational aggression. Relational aggression consists of verbal and non-verbal behaviours (also referred to as indirect aggression) used to manipulate interpersonal relationships, control or hurt others by destroying their friendships and reputation, and induce negative emotions with behaviours such as gossiping and social exclusion (Crick & Grotpeter, 1995). Like reactive and proactive aggression, relational aggression and overt aggression are consistently found to be related but distinct constructs in the literature, with a moderate correlation ($r = .54$) existing between the two types (Crick & Grotpeter, 1995). As with physical aggression, the origins of relational aggression are primarily related to environmental influences, particularly family relationships (Spieker et al., 2012). Parents of physically aggressive children tend to attribute misbehaviour to internal, controllable factors within the child. They respond to the child’s aggression with more negative emotions and harsher discipline (characteristic of authoritarian parenting) than parents of nonaggressive children (Johnston & Ohan, 2005). In contrast, both permissive and authoritarian parenting styles have been associated with an increased likelihood of a child using relational aggression in friendships (Casas et al., 2006; Hart, Nelson, Robinson, Olsen,

& McNeilly-Choque, 1998), and this association appears to be especially robust for mother-daughter pairs (Sandstrom, 2007; Underwood, Beron, Gentsch, Galperion & Risser, 2008). Parents of children who are relationally aggressive are described as being at times both coercive and unresponsive (Hart et al., 1998). Ostrov and Godleski (2007) have noted that the use by parents of psychological control (e.g., love withdrawal; Nelson, Hart, Yang, Olsen & Jin, 2006) is a strong predictor of relational aggression in the child.

Individual differences in relational and physical aggression appear to be stable during early and middle childhood (Leff, Waasdorp, & Crick, 2010; Werner, 2012). Vaillancourt, Brendgen, Boivin, and Tremblay (2003) found in a sample of 4 to 11 year old children that individual levels of indirect (including relational) aggression were distinct from those of physical aggression, and stable across 2- and 4-year periods. There was no indication that children shifted from physical to indirect modes of aggression (or vice versa) across these periods, supporting the notion that, once children choose to aggress in a particular way, they continue to use this method (Crick, 1996; Vaillancourt, Miller, Fagbemi, Cote, & Tremblay, 2007). Werner (2012) argues that individual differences in relational aggression are more stable in girls than in boys.

The topic of gender differences and aggression is an ongoing one, with some reviewers arguing that the research does not yield consistent gender difference patterns (Gini, Albiero, Benelli, & Altoe, 2007; Mullin-Rindler, 2003; Young, Boye, & Nelson, 2006), while other researchers conclude that girls engage in relational aggression more often than boys (e.g., Archer, 2004; Crick, 1997; Crick, Bigbee, & Howes, 1996; Crick & Nelson, 2002; Crothers, Field & Kolbert, 2005; Talbott, Celinska, Simpson, & Coe, 2002; Herrenkohl et al., 2007). Recently, Crapanzano, Frick, and Terranova (2010) reported that

girls had relational aggression risk profiles of emotional and cognitive correlates that mirrored those of physical aggression profiles of emotional and cognitive correlates for both boys and girls. Those correlates included anger dysregulation, impulsivity, callous-unemotional traits, and positive outcome expectancies for aggression, suggesting that the precedents of relational aggression in girls may be the same as the precedents of physical aggression in both genders. According to Smith, Rose, and Schwartz-Mette (2009), it is likely that boys who are physically and verbally aggressive are relationally aggressive as well; however, the more salient nature of overt aggression draws observers' focus away from more covert relationally aggressive behaviours, resulting in the misleading belief that boys do not engage as often in relational aggression. One advantage of the recent distinction between, and the increasing research interest in, relational aggression and physical aggression is that cultural stereotypes of gender "normative" and "appropriate" expressions of aggression are being more explicitly addressed in the literature. When both relational aggression and physical aggression are taken into account, boys and girls may in fact be equally aggressive (Spieker et al., 2012).

Both physical aggression and relational aggression increase the risk of future problem behaviours (Herrenkohl, Catalano, Hemphill, & Toumbourou, 2009). Relational aggressors are comparable to their physically aggressive counterparts in that they also score high on a variety of risk factors, including negative peer influences, positive attitudes to antisocial behaviours, sensation-seeking, rebelliousness, and family history of antisocial behaviour (Herrenkohl et al., 2007). However, relational aggression has been found to be more strongly associated with internalizing problems, whereas physical aggression is believed to be more strongly associated with long-term externalizing problems (Mathieson & Crick, 2010). When

children use relational aggression to maintain their social status, they may struggle to form authentic friendships, as friends are not seen as people to share intimate thoughts with, but as a means for gaining control or gathering information about other children (Andreou, 2006; Parkhurst & Hopmeyer, 1998; Sandstrom & Cillessen, 2006; Young et al., 2006). Over time, these aggressors may become more and more disliked, leading to social maladjustment, peer rejection (Crick, 1996; Crick & Grotpeter, 1995; Mullin-Rindler, 2003), and psychosocial adjustment difficulties that are more prevalent for relational aggressors than for physical aggressors, such as withdrawn behaviour, anxiety, and depression (Crick, Ostrov, & Werner, 2006). Card, Stucky, Sawalani, and Little (2008) conducted a meta-analytic review of almost 150 studies examining the psychosocial correlates of indirect aggression (i.e., social/relational) and direct aggression (i.e., physical and verbal) in children and adolescents. Internalizing problems such as anxiety and depression were found to be strongly and uniquely associated with indirect aggression, whereas emotional dysregulation and ADHD symptoms were strongly and uniquely associated with direct aggression. Delinquency, conduct problems, and peer rejection were significantly associated with both forms of aggression; generally, however, direct aggression was more strongly related to these difficulties than indirect aggression (Card, Stucky, Sawalani, & Little, 2008).

Overall, while research does find that relational and physical forms of aggression are moderately correlated (e.g., Crick & Grotpeter, 1995), relational aggression appears to be somewhat unique in its origins, features, stability and possible gender expressions.

The Portrayal of Relational Aggression: More Proactive or Reactive?

Increased attention is being given to identifying correlates of the different functions and forms of aggression, in particular research that aims to distinguish the emotional and

cognitive correlates of reactive and proactive subtypes of relationally aggressive behaviour (e.g., Marsee & Frick, 2007; Ostrov & Houston, 2008). Even though relational aggression, and associated concepts such as social aggression and indirect aggression, are defined and measured in different ways, the concepts are virtually identical in terms of the goals and basic strategies that typify the aggressive behaviours of interest (e.g., Coyne, Archer, & Eslea, 2006; Marsee & Frick, 2007). Some researchers have suggested that relational aggression consists primarily of proactively aggressive behaviours (e.g., Hawley, 2003a; 2003b; Rose, Swenson, & Waller, 2004). Relational aggression does echo the qualities of proactive aggression, in that it is often instrumental (i.e., it is carried out with a goal in mind) and used with the expectation of rewards from its implementation (Kempes et al., 2005), is typically covert and indirect when compared to the more overt behaviours of reactive aggression (Archer, 2001), tends to be executed in a calculating and revenge-like manner (Kempes et al., 2005), and is hypothesized to be maintained via positive reinforcement (Mayberry & Espelage, 2007).

Bjorkqvist (1994) conceptualizes the use of indirect forms of aggression as the calculation of an effect-danger ratio. He argues that indirect aggression is often judged to be the most effective option for inflicting emotional injury because it is surreptitious, has less potential for punishment or retaliation, and targets social relationships, which are of high importance to other young adolescents (particularly young females). Such planful cognitive calculations suggest that relational aggression may be characterized not by the lower cognitive competencies that research has associated with many aggressive children (e.g., Alvarez & Ollendick, 2003), but rather by average or above-average means-end thinking abilities. The extent to which relational aggression can be characterized as reactive or

proactive in nature is still unclear, but overall relational aggression appears to be less reactive and more goal-oriented.

Negative Consequences of Relational Aggression Across the Lifespan

The ability to aggress without using physical force becomes more feasible as verbal and social-cognitive skills develop (Vaillancourt et al., 2007). As children enter early adolescence, relational aggression becomes more covert and sophisticated, and is more likely to be fuelled by present and past peer transgressions (Ostrov & Godleski, 2007). Cognitive and social proficiencies become more heavily implicated in aggression as adolescents begin to understand better what behaviours are most hurtful to peers (Young et al., 2006). Peer relationships take on major importance during this period, and acceptance and social dominance become important yet divergent goals (Parker & Asher, 1987; Parkhurst & Hopmeyer, 1998). Thus, it may come as no surprise that in this stage of development relational aggression becomes both more accepted and prevalent among youth, but is also perceived as equally or more harmful to others in comparison to physical aggression (Coyne, Archer, & Eslea, 2006; Galen & Underwood, 1997; Werner & Hill, 2010).

While some amount of relational victimization is probably experienced by most individuals (Crick, Casas, & Nelson, 2002) and may not be harmful to all, extreme cases of enduring particularly cruel bullying may have especially negative consequences. One concern with the outcome of relational aggression is that it may produce enough negative affect in victims to result in violent retaliation, putting aggressors at risk for physical altercations (Merrell, Buchanan, & Tran, 2006). For example, relational slights have been suggested as significant contributing factors for several high visibility fatal incidents in educational settings, such as the 1999 school shooting in Littleton, Colorado (Juvonen,

Graham, & Schuster, 2003; Young et al., 2006). Furthermore, research has found that, at least for males, being a victim of or merely a witness to high levels of relational aggression is associated with a higher likelihood of bringing weapons to school (Goldstein, Young, & Boyd, 2008). Adolescents who report high levels of exposure to relational aggression (whether as victims or witnesses) rate their schools as less safe, and are more likely to report having negative social experiences there (Goldstein et al., 2008).

Both victims and perpetrators of relational aggression have considerable long-term difficulties in social-psychological adjustment; however, victims suffer most with concurrent and future problems (Werner, 2012). Aside from the decreases in perceived safety in the school environment, being a target of relational aggression is associated with peer rejection, internalizing disorders, externalizing disorders, and later substance use (Crick, Casas, & Nelson, 2002; Crick & Nelson, 2002; Crick, Ostrov & Werner, 2006; Ostrov & Godleski, 2007). Relational aggression and relational victimization have been found to be moderately correlated over periods of several months. This suggests that the two roles may become reciprocal, with victims becoming more willing over time to retaliate and punish the bully or defend themselves (Yeung & Leadbeater, 2007), thus putting themselves and others at further risk. Perhaps not surprisingly, suicidal ideation is higher in both relational aggressors (e.g., Fite, Stoppelbein, Greening, & Preddy, 2011) and victims. Being the target of relationally aggressive bullying has recently been suggested as the main contributing factor in a number of youth completed suicides (e.g., Post, 2012).

Relational aggression may also continue to be a common strategy for some individuals later in life, and can be associated with diverse adult social-psychological difficulties. Pepler, Jiang, Craig, and Connolly (2008) examined the trajectory and the

associated risk factors that relational bullying behaviours can entail. They followed a sample of 10 to 14 year old children over a period of 7 years, and found that 50% of participants engaged in bullying at some point during the study period. Approximately 20% of the sample was classified as being on a “career path” trajectory for bullying; these children engaged in high levels of aggression over an extended period of time. High-bullying children were over 16 times more likely to rank high on “moral disengagement”, and behaved in ways that were cruel to others, untrustworthy, manipulative, and seemingly lacking in guilt. The interpersonal qualities of relational aggression, particularly cold and calculated patterns of interaction, may make it a good contender for predicting the later emergence of personality disorders (Tackett & Ostrov, 2010). For example, after controlling for overt aggression, relational aggression was found to correlate significantly with features of psychopathy, as well as with DSM-IV cluster B traits (Schmeelk, Sylvers, & Lilienfeld, 2008; Werner & Crick, 1999).

Relational aggression may continue to be a common and problematic social strategy among some men and women in later life, and it is easy to imagine that these behaviours could impair relationships with friends and work colleagues, disrupt romantic relationships, and interfere with effective parenting (Galen & Underwood, 1997). This makes understanding the correlates and qualities of relational aggression all the more imperative for prediction, intervention, and treatment purposes.

A Frame of Reference: Social Information-Processing Theory

A contemporary model for understanding aggression suggests that children who aggress have different, occasionally deficient means of processing and using social information. Crick and Dodge’s (1994) reformulated Social Information-Processing Theory

(see Figure 1) proposes that children enter social situations with a set of biologically determined propensities for action, and that they process social information and make behavioural decisions using a repertoire of memories from past social encounters. Processing social information and determining a course of action involves a number of steps. First, a child attends to signals, both internal (such as emotions) and in the environment, and encodes them. Next, the encoded information is interpreted and compared to mental representations that the child holds. Mental representations include social scripts, schemas, and working models of relationships that allow the child to sort stored social information quickly and efficiently, and determine if that stored social information is consistent or inconsistent with their current situation. Interpretation of the social information itself involves a number of processes, such as decisions about the causes of events, attributions about the perceptions and intents of others, and determinations about the success of one's past social-behavioural strategies. This includes examining the correctness of outcome expectancies, and reviewing the historical behaviours of self and others (Crick & Dodge, 1994). The third step in social information processing occurs once the information is interpreted; the child selects a behavioural goal or carries on with a pre-existing one. Goal selection is amenable to change based on the pressing social demands of the situation. Social goals can also be based on a number of different internal and external sources, such as temperament, emotions, adult modeling and instruction, beliefs and values, and gender and cultural norms.

After there is a goal in mind for how the immediate social event will hopefully unfold, the child proceeds to the fourth step in social information processing, by accessing memory to examine the possible behaviours used in previous similar encounters.

Alternatively, the child creates a new response if the situation is novel. The content of the

responses at a child's disposal and the order in which they are accessed are limited and guided by experience – some children have many more options available to them than others, like having one or more tools in a toolbox available for use on a certain task. The fifth step in the model has the child deciding on a behavioural response. This step takes into account evaluations of past outcomes, the amount of confidence the child has in his or her ability to carry out the response, and whether the response itself is appropriate for the situation. The child then selects the response that has been evaluated as having the best possible outcome (i.e., the response with the most positive outcome expectancies). Finally, the behaviour is carried out accordingly. As children develop, they encounter more and more variable social experiences that allow them to fine-tune their processing of social information so that they are more efficient, organized, and sophisticated analyzers of social situations (Crick & Dodge, 1994).

Social information processing skills of relationally aggressive children: Deficits, differences, or superiority? According to social information processing theory, the variability in the expression and intent of aggressive behaviour stems from individual users' beliefs, goals, and how they interpret others' behaviours and objectives (Loudin, Loukas, & Robinson, 2003). Research supporting this idea as it relates to relational aggression can be seen with regards to the first two steps of social information processing: the encoding and interpretation of signals. First, the relational form of aggression likely requires a certain minimum level of social intelligence in order for it to be used effectively (Garandeau & Cillessen, 2006). Andreou and colleagues (2004, 2006) examined social information processing and its association with relational aggression in a sample of fourth- through sixth-grade children. Social information processing and social awareness scores were found to be

predictors of peer-nominated relational aggression. Specifically, more accurate perception and interpretation of social cues were predictive of higher levels of relational aggression (Andreou, 2006). Thus, it appears that, at least within the first two steps of the social information processing model, the social cognitive abilities of children who are relationally aggressive may be relatively intact.

While some evidence suggests that relationally aggressive children possess average or superior skills in social information encoding and interpretation, some research indicates that certain deficits in the early stages of social information processing may be associated with relational aggression. For instance, researchers have examined hostile attributional biases and their role in relational aggression; the findings on this topic are mixed (Crain et al., 2005; Yeung & Leadbeater, 2007). Werner (2012) found that self-reported hostile intent attributions in response to hypothetical relational conflicts predicted girls' and boys' use of relational aggression. However, and perhaps most importantly, both Werner (2012) and Godleski and Ostrov (2010) have noted that engaging in relational aggression is not uniquely linked with hostile intent attributions. In fact, Godleski and Ostrov (2010) found that only physical aggression was associated with hostile attributional biases in youths' relational conflicts. Thus, the findings with respect to hostile attributional biases are not inconsistent with the possibility that relational aggressors' perceptions and interpretation of social cues may be average. Instead, other components of the social information processing sequence may have more power in describing how and why relational aggression occurs.

When children view aggression as an acceptable behaviour in conflicts, they are more likely to access this behavioural response in social information processing, and aggress both concurrently and in the future (Henry et al., 2000; Huesmann & Guerra, 1997). Aggressive

adolescents are more likely to have scripts and schemas that include beliefs that aggression is a normative social skill, as well as positive outcome expectancies for engaging in aggression (Huesmann, 1998; Werner & Hill, 2010). For example, Mikami, Lee, Hinshaw, and Mullin (2008) found a modest correlation between the frequency of adolescent girls' aggressive response choices to hypothetical vignettes and levels of peer-nominated relational aggression.

Normative beliefs about aggression also increase the efficiency of social information processing in the immediate social environment, both on the individual and peer group level, by functioning as scripts and schemas that children access. Werner and Hill (2010) examined third through eighth graders' level of approval of the use of relational aggression, and found that individuals' beliefs that relational aggression is normative predicted significant variance in their rates of relationally aggression behaviour. Students in classrooms with high approval ratings of relational aggression also became increasingly aggressive over a year of study (Werner & Hill, 2010). Bellmore, Villarreal, and Ho (2011) reported similar findings for physical, verbal, and relational aggression; classroom norms for aggression moderated the association between social status and aggressive behaviour, so that youth who attained or maintained high social status engaged in higher levels of aggression if the classroom culture was supportive of aggression. Taken together, these findings offer support for the utility of the social information processing framework in explaining relational aggression, particularly concerning the role of aggressors' normative beliefs and positive outcome expectancies. Beliefs that aggression is normative appear to influence the activation and retrieval of scripts, thereby affecting interpretations of others' behaviour and the process of searching for and selecting behavioural responses (Mayberry & Espelage, 2007). In this way, behavioural

responses become biased towards consistently aggressive, and thus globally socially unacceptable, choices.

Some researchers have criticized the social information processing model's application to understanding relational aggression by citing the failure of hostile attribution biases to predict using relational aggression (e.g., Crain, Finch, & Foster, 2005; Mikami et al., 2008). However, this criticism may in fact be erroneous because it appears that the social information processing deficits of relational aggressors occur not in the early steps of information processing but rather in the later steps, such as goal clarification, access to or construction of responses, and selection of behavioural responses. These steps are affected by beliefs that aggression is a normative social skill and will result in positive social outcomes. This model seems both to account for relational bullies possessing sufficient skill to interpret socially provoking circumstances accurately (Arsenio & Lemerise, 2001), and for the idea that they may experience difficulties and differences when it comes to choosing more appropriate prosocial goals and responses.

Subtyping aggression as reactive or proactive also appears to have relevance for determining at what level of social information processing aggressive children may have difficulties. Some studies suggest that children who are more reactively aggressive have information processing deficits (Crick & Dodge, 1996; Dodge & Coie, 1987) that include difficulties with executive functioning (Giancola et al., 1996; Raine et al., 2006). Reactively aggressive children often misinterpret social cues and are more prone to lose self-control in response to perceived provocation (Salmivalli & Nieminen, 2002). Thus, children who are reactively aggressive appear to experience difficulties with the first two stages of social information processing (i.e., encoding and interpretations of cues; Kempes et al., 2005). In

contrast, children who are proactively aggressive are believed to be quite capable of understanding the cognitions and emotions of others and may in fact have empathic perspective-taking skills that are superior to those of children who are reactive aggressors (Mayberry & Espelage, 2007). For this reason proactively aggressive children seem not to be as vulnerable to hostile attributional biases as reactively aggressive children (Crick & Dodge, 1996; Sutton et al., 1999). The former display lower levels of internalizing difficulties compared to reactive aggressors (when gender is controlled for). Mathieson and Crick (2010) suggest this may be related to the emotionally buffering effect of the adequate social skills of proactively aggressive individuals, which are used in prosocial ways to maintain status, and which result in successful achievement of their social goals.

When selecting goals and associated behavioural responses in social situations, children who aggress proactively appear to have positive outcome expectancies for using aggression, believing that it will result in greater social dominance and status. They also express greater confidence in being able to carry out the aggressive response, and expect that they will experience few or no negative effects afterwards such as punishment or social retaliation (Crick & Dodge, 1994; Dodge & Coie, 1987; Smithmyer, Hubbard, & Simons, 2000; Arsenio & Lemerise, 2001). In light of proactively aggressive individuals' average or above-average social cognition skills (e.g., Sutton et al., 1999), these beliefs may not be mistaken and may therefore not be indicative of a processing deficit at the stage of encoding and interpreting social stimuli. If any deficits or differences in social information processing exist, proactive aggression seems to be associated more with difficulties in the three last stages of social information processing, much as it appears is the case for relational aggression. Specifically, proactively aggressive children's approaches to goal clarification,

behavioural response access, and decision making may be problematic (Kempes et al., 2005), as they are believed typically to result in more frequent choices of aggressive behaviour (see Figure 2 for theoretical elaboration).

In summary, research findings suggest that some of the social information processing skills of individuals who are proactively relationally aggressive may not be deficient. In contrast, children who are reactively relationally aggressive likely exhibit the hostile attribution biases, social skill deficits, and impulse control difficulties typical of children prone to reactive physical aggression. Children who use proactive aggression appear to differ in that they may have a superior understanding of the determinants of interpersonal behaviour. They may simply have different personal goals for and beliefs about using aggression in social interaction. Indeed, Werner & Hill (2010) noted that children's moral evaluation of relational aggression is uniquely associated with their use of this behaviour. In the case of children who are proactively relationally aggressive especially, their interpersonal beliefs and approach to goal selection and response decisions appear to mirror the core elements of Machiavellianism.

Machiavellianism

Machiavellianism has been defined as the tendency for a person to believe that others are not to be trusted, are easily manipulated, and that it is acceptable to influence them in interpersonal relationships in a devious fashion (Andreou, 2004; Christie & Geis, 1970). Some children are especially effective at achieving their personal social goals, and can be deceptive, manipulative, and aggressive in doing so (Hawley, 2003a; Hawley, Little & Card, 2007). In a study of grade 5 to grade 10 children, those who reported using both coercive and prosocial strategies of social control (i.e., Machiavellians) described themselves as more

aggressive, hostile, and more likely to cheat than children who did not use this combination of strategies (Hawley, 2003a). While their peers rated them as some of the more socially central, skilled, and well-liked participants, Machiavellian children were also rated as the most aggressive. These findings suggest that children who engage in Machiavellian behaviour are seen by both themselves and peers as aggressive, deceitful, and hostile. While they may appear to be agreeable and prosocial, their intentions for social interaction are fundamentally different from those of other children. A clever use of prosocial behaviour, carried out primarily for appearance's sake in order to achieve one's social goals, appears to be one of the central features of Machiavellianism. It would not, however, meet the definition of prosocial behaviour, which is behaviour intended to aid or benefit others (Eisenberg & Mussen, 1989).

One important factor that may impact children's behavioural response access, and subsequent selection of relationally aggressive behaviours over more prosocial behaviours, can be the negative attitudes and beliefs that they hold about human nature. Specifically, children who use relational aggression may subscribe to beliefs in an essentially negative nature of individuals. This may then support their use of Machiavellian strategies to maintain social power and influence over others (LaFontana & Cillessen, 2002). Research has generally found that children labelled as bullies hold more Machiavellian attitudes than do nonaggressive children (Andreou, 2000, 2004; Sutton & Keogh, 2000, 2001). Andreou (2000) had 181 children ranging from 8 to 12 years of age complete measures of bullying, victimization, self-esteem, Machiavellianism, and locus of control. Results showed that both bullies and victims scored high on Machiavellianism, low on self-esteem, and reported having lower internal locus of control relative to controls (i.e., children classified into a low

bully/low victim “not involved” group). The latter finding seems to contradict the idea that children who are more Machiavellian in their social strategies have confidence in the efficacy of their aggression and positive outcome expectancies for their response decisions. However, Andreou (2000) did not differentiate between different types of aggression in this study. Physical, verbal, and indirect aggression are all associated with an external locus of control (e.g., Osterman et al., 1999), which may partially account for the findings of lower internal locus of control in bullies in Andreou’s (2000) sample.

Machiavellianism is often distinguished by its association with social skills and perceptiveness (Repacholi et al., 2003). As such, it may play an especially key role in the effectiveness of interpersonal aggression. In a study of middle-school aged children, Machiavellianism was found to contribute significantly to the prediction of proactive aggression but not reactive aggression (Kerig & Stellwagern, 2010). Overall, Machiavellianism was more strongly associated with proactive aggression and relational aggression than with reactive aggression or physical aggression. It is the socially intelligent, competent child that is capable, because of strong meta-cognitive skills, of choosing to be either aggressive or peaceful in individual response decisions (Bjorkqvist, Osterman, and Kaukiainen, 2000). Certainly, children who use relational aggression effectively would need to have a good understanding of how best to interact with and manipulate others in order to fulfill their social wishes. For example, Cillessen and Mayeux (2004) found that, over a 5 year period, perceived popularity (based on peer group nominations) consistently and positively predicted the use of relational aggression, particularly for girls. These findings lend credence to the argument that popular and socially skilled youth may use proactive

relational aggression in a Machiavellian fashion to maintain high social status at the expense of their peers.

Machiavellian attitudes exemplify the conceptualization of mental representations, such as scripts, schemas, and working models of relationships, that are key to social information processing. These cognitive resources are probably accessed by proactively and relationally aggressive children at numerous steps in the course of social information processing, such as when interpreting social signals, engaging in goal selection, and selecting responses in interpersonal situations. Sutton and Keogh (2000) found that children who endorsed a high desire to achieve their social goals were also more likely to endorse attitudes that were favourable towards manipulation of interpersonal relationships, leading the authors to argue that this association may be indicative of a general strategy for social success at the expense of others (i.e., Machiavellianism) in some aggressive children.

Indeed, socially dominant youth may be aggressive in a way that allows for goal attainment and sufficient social admiration to offset any negative consequences of their behaviour. Children who are Machiavellian appear to maintain equilibrium between targeted use of manipulation and aggression and perceived prosocial behaviour to gain social advantages (Hawley, 2003). They can display typically positive characteristics such as conscientiousness, agreeableness, and physical attractiveness (Bruyn & Cillessen, 2006; Vaillancourt & Hymel, 2006). However, it is also quite likely that any social prestige that Machiavellian children have springs less from them possessing actual prosocial characteristics than from the fear that other students have of being their next victim, or of being socially associated with their current victims (Juvonen et al., 2003). In fact, bullies who endorsed positive attitudes towards the manipulation of interpersonal relationships for

goal achievement scored significantly lower on pro-victim measures than other children, demonstrating less sympathy for victims of bullying (Sutton & Keogh, 2000). Being less sympathetic towards victims may serve to increase proactive decisions to use relational aggression to maintain one's social status.

In short, it appears that Machiavellianism may affect social information processing by encapsulating mental representations and values that feed into almost all steps of the social information processing sequence. As such, it could be one of the individual differences that distinguish proactively and relationally aggressive children from their non-aggressive peers.

Empathy

Empathy, although notoriously difficult to define precisely and measure in psychological research (Warden & MacKinnon, 2003), has been described as feelings that are "more congruent with another's situation than with one's own situation" (Hoffman, 2000, p. 30), and as sharing in the emotional experience of another (Eisenberg and Strayer, 1987). Empathy is thought to be a multidimensional concept in which components such as role-taking ability and experiencing concern and sympathy for others' distress both coexist and act as inhibitors of aggression (Gini et al., 2007). Lovett and Sheffield (2007) noted that evolutionary research led to the belief that, although empathic ability may be a species-wide phenomenon, empathic tendency is subject to individual differences. Empathy, then - or perhaps a lack thereof - is another possible predictor of relational aggression.

Aggression is typically regulated by internal processes such as empathy, in that children are usually taught and motivated to attune themselves to the emotions and motivations of others and as such are prepared to be cooperative with peers (Peterson &

Flanders, 2005). However, as meta-cognitive skills begin to flourish at approximately 11 to 12 years of age, levels of peer-estimated conflict are at their height (Bjorkqvist, Lagerspetz, & Kaukiainen, 1992; Bjorkqvist, Osterman, and Kaukiainen, 2000). Empirical evidence shows a negative relationship between affective empathy and aggression in youth (Lovett & Sheffield, 2007; de Wied, Branje, & Meeus, 2007). A meta-analysis by Jolliffe and Farrington (2004) reported an inverse relationship between aggressive behaviours and affective empathy, adding that this association appears to be stronger in adolescents and young adults. Caravita and colleagues (2009) found, in a sample of 200 young adolescent participants, that perspective taking skills (i.e., cognitive empathy) were in fact positively associated with bullying behaviour.

What appears to be missing in the social information processing of some aggressive children is a sense of empathy regarding the harm done to victims, in addition to the belief that manipulating others for one's own goals (i.e., a Machiavellian approach) is morally repugnant (Sutton, Smith, & Swettenham, 1999). Numerous authors have proposed that children who use relational aggression have superior perspective taking skills, but lack affective empathy (Arsenio & Lemerise, 2001). A similar pattern of results has been reported for proactively aggressive youth by Sutton and colleagues (1999, 2000, 2001), suggesting that proactive aggressors generally have superior perspective-taking skills compared to reactive aggressors. This suggests that the determinants of proactive aggression lie less in early stages related to interpretation of social cues, and more in stages of goal selection, response decision and behavioural activation.

Indeed, proactively aggressive children appear to have strong social cognitive skills. Sutton and colleagues (1999) found, in a sample of children as young as 7 years old, that

“ringleader” bullies scored higher on total social cognition scores than every other group of children (e.g., assistant/follower bullies, reinforcers, defenders, and victims), except for those who were not involved in any aspect of the bullying process (i.e., outsiders/bystanders). How does empathy impact the choice between aggression and prosocial behaviour when one has high levels of social cognitive skills? Bjorkqvist, Osterman, and Kaukiainen (2001) found that empathy was a significant moderator of aggressive behaviour. Specifically, when empathy scores were partialled out, the correlations between social intelligence scores and aggression increased, while those between social intelligence and prosocial forms of conflict resolution decreased. This suggests that higher or lower empathic tendency, or a lack thereof, is an important determinant of aggressive behavior even in children who appear to be skilled social information processors. However, these earlier studies did not examine differences between different form and function subtypes of aggression.

Overall, empathic concern is associated with lower levels of both physical and relational aggression, whereas perspective taking is predictive of higher levels of relational aggression (Batanova & Loukas, 2011). Although strong perspective taking abilities may reflect good social information processing abilities in relationally aggressive youth, these children may remain unwilling to display empathic concern towards others (Batanova & Loukas, 2011), and may therefore select behavioural responses that are aggressive and negative. Marsee and Frick (2007) had a sample of 58 detained female youth complete measures of aggression (classified as overt, relational, reactive, and proactive), callous-unemotional traits, emotional dysregulation, attributional tendencies, and outcome expectancies for aggression. Callous-unemotional traits are typified by a lack of empathy and guilt (Essau, Sasagawa, & Frick, 2006). Findings revealed that individuals high on

aggression tended to display different patterns of scores on measures of emotional and cognitive variables as a function of the type of aggressive behaviour. Specifically, proactive relational aggression had a stronger association with callous-unemotional traits than did overt aggression. Proactive relational aggression had a stronger association than reactive relational aggression with positive outcome expectancies for aggression. It appears likely, then, that children who engage in the use of relational aggression, particularly in a proactive manner, will display lower levels of empathy than their nonaggressive peers.

Overall, more relationally aggressive youth appear to lack a sense of empathy with regard to the harm they inflict on their victims. In the case of proactive relational aggressors, this lower empathic concern is present despite an apparently intact ability to take the perspectives of others (Andreou, 2006; Bjorkqvist, Osterman, & Kaukiainen, 2001; Sutton & Keogh, 2000; Sutton, Smith, & Swettenham, 1999). Empathy as an element of mental representations may be drawn on across multiple steps in social information processing. Studies have found low empathy to be associated with more maladaptive conflict resolution techniques, such as conflict engagement (e.g., becoming verbally aggressive, angry, and losing self-control; de Wied et al., 2007), suggesting that lack of empathy is important in the response access and selection stages of social information processing. Batanova and Loukas (2011) postulate that those high in empathic concern are not likely to evaluate aggressive behaviours positively, and so are less inclined to decide to use aggressive strategies in social conflicts. In contrast, children who have low affective empathy yet who are able to take another's perspective may be more effective in using that perspective to manipulate and damage reputations or relationships. In other words, low empathy appears to be an important factor in the social information processing of relationally and proactively aggressive

children, as it organizes and motivates the selection and behavioural activation of the aggressive responses (Mayberry & Espelage, 2007).

Emotion Regulation

Of further value in understanding relationally aggressive children's social information processing may be the role of another affective variable touched on in Marsee and Frick's (2007) study. Namely, they found that participants who used relational aggression in a reactive way had poorer emotion regulation, and were quicker to become angry in response to perceived provocation. To what extent does emotion regulation play a role in the social information processing of reactive and proactive relationally aggressive children?

Much like empathy, emotion regulation is a concept that researchers continue to struggle to define (e.g., Eisenberg & Spinrad, 2004). Cicchetti and colleagues defined emotion regulation with reference to emotional flexibility, lability, and responsivity to situational stimuli, describing it as "the capacity to modulate one's emotional arousal such that an optimal level of engagement with one's environment is fostered" (Shields & Cicchetti, 1997, p. 907). Gross defined emotion regulation as involving processes (which may be conscious or unconscious, controlled or automatic) "by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998, p.275). The development of emotion regulation processes begins early in life, when infants and toddlers learn to regulate emotional displays through soothing behaviours and reduction of exposure to provoking stimuli, and later via socialization of emotional displays and the use of social referencing with their parents (see Zeman, Cassano, Perry-Parrish, & Stegall, 2006, for a review of emotion regulation and development). Well-

regulated children are able to meet the changing demands in their environment with a variety of socially appropriate and flexible responses, which allow for both inhibitory and spontaneous behaviour (Kim & Cicchetti, 2010). Being flexible enough to be spontaneous or inhibit certain behaviour in social situations is important for responding adaptively to changing social stimuli and to maintain social harmony. Perhaps not surprisingly then, more emotionally regulated children tend to be more competent in peer interactions (Calkins et al., 1999), whereas children who struggle to disguise feelings of sadness or fearfulness are at risk for teasing and peer rejection (Shields & Cicchetti, 1998).

By and large, children of various ages who struggle with emotion regulation, particularly those with other early risk factors, are more likely to exhibit externalizing symptoms and engage in higher rates of physical aggression (e.g., Conway, 2005; de Castro, Merk, Koops, Veerman, & Bosch, 2005; Hill, Degnan, Calkins, & Keane, 2006; Lengua, 2003). For example, Degnan, Calkins, Keane, and Hill-Soderlund (2008) examined disruptive (i.e., aggressive and defiant) behaviour, frustration reactivity, and a physiological measure of emotion regulation in over 300 children tested at ages 2, 4, and 5. Children who displayed high levels of frustration reactivity and physiological arousal (indicative of low emotion regulation) were more likely to engage in high levels of disruptive behaviour in comparison to children with lower levels of frustration reactivity, lower levels of physiological arousal, or both.

Until recently, emotion regulation research with regard to aggression has focused predominantly on physical and reactive types of aggression. It is possible that the same dysregulation difficulties present in physically aggressive children are also present in relationally aggressive children. However, it may be that relational aggression is less

associated with high levels of emotional arousal than physical aggression, and that the pattern of emotion regulation also differs depending on whether the aggression is reactive or proactive in function.

As children develop, they typically become more proficient at managing their own emotional expression in line with the demands of a social situation (Shields & Cicchetti, 1997; 1998; 2001). For some aggressive children, emotion expression may not reflect cultural “display rules”, which dictate how facial expressions are to be appropriately managed and modified in the social environment (Ekman & Friesen, 1969). Reactive aggression is often associated with high levels of emotion and “hot” cognitions such as hostile attributions and negative responses to ambiguous provocations, while proactive aggression is more strongly associated with “cooler” cognitive components such as positive outcome expectations and callous-unemotional traits (Kempes et al., 2005). Hubbard and colleagues (2002), using a sample of second-grade children, examined teacher-rated proactive or reactive aggression, physiological measures of emotionality, and self-reported anger. Angry nonverbal behaviours (i.e., facial expressions, displays of frustration) and physiological measures of emotional arousal were positively associated with reactive aggression, but negatively associated and not significantly associated, respectively, with proactive aggression. These findings support previous assertions (e.g., Arsenio & Lemerise, 2001) that reactive aggression is more “hot-headed” than proactive aggression (Hubbard et al., 2002). This reactivity, perhaps reflecting poor emotion regulation abilities (Eisenberg et al., 2000) and stronger hostile attributional biases, could predispose a child who is more reactive to jump to conclusions about others’ behavioural intentions and to select in haste an

aggressive behavioural response. However, the connection of this reactivity to hostile attributional biases was not examined in Hubbard and colleagues' (2002) study.

Currently, little research examining the importance of emotion regulation for relational aggression has been reported. Emotional reactivity may be a key factor in the significance of emotion regulation for different types of aggressive behaviour in children. Murray-Close, Han, Cicchetti, Crick and Rogosch (2008) found that relationally aggressive children displayed neuroendocrinological indices of under-arousal (i.e., hypocortisolism) in comparison to physically aggressive and non-aggressive peers. Eisenberg and Fabes (1992) hypothesized that children who use proactive aggression may in fact have emotion regulation deficiencies that mirror those of reactive children, but do not display them because of their comparatively lower levels of emotional intensity. It may also be the case that emotion regulation differences affect levels of emotional reactivity, rather than the reverse. It is also possible that proactive, relationally aggressive children may lack affective empathy because they do not experience sufficient emotional reactivity to become upset at another's distress. Nevertheless, Heilbron and Prinstein (2008) argue, based on empirical findings of relationally aggressive children's generally strong friendships, that this form of aggression is indicative of a mature pattern of delayed gratification and frustration tolerance, implying at least average emotional regulation and perhaps empathic abilities.

Taken together, these findings have interesting implications for the potential response selection, decision, and behavioural activation tendencies in proactively aggressive children's social information processing. Instead of lashing out aggressively against someone immediately (as a more reactively inclined child would do), whatever has angered or upset a child who is proactively relationally aggressive may be regulated but retained in memory

following the interaction that initiated the negative emotional state. The memory of this interaction and its resulting negative emotions for the aggressor may then be drawn on in social information processing via goal selection, and used planfully for the later use of covert aggressive behaviours towards the offending child.

Some researchers have argued that a low level of emotional reactivity in a child who is proactively aggressive would leave the early steps of social information processing intact by, for example, making it less likely that a child would foster hostile attribution biases. At the same time, this low reactivity could ease the transition to selecting and enacting an aggressive behavioural response, presumably due to a lesser need to self-regulate one's own distress in response to another's emotional reaction (Cohen & Strayer, 1996). Lotze, Ravindran and Myers (2010) found that children who were self-aware and skilled in regulating their affect could still demonstrate callous-unemotional (i.e., unempathic) traits. It could be that children who engage in proactive, relational aggression are less emotionally aroused by the distress of others, thus leading to lower empathic activation when aggressing against another child, and a lower need to regulate their own negative emotional reactions to witnessing (and inflicting) distress in a peer.

Present Study

Research has begun to delve into the significance of various emotional and cognitive correlates in the prediction of proactive and reactive subtypes of relationally aggressive behaviour in children. The Social Information-Processing theory (Crick & Dodge, 1994) serves as a useful framework to aid in understanding at what point in the processing sequence individual differences in cognitive and emotional processes may play a role. While previous research has explored the individual impact of Machiavellianism, empathy, and

emotion regulation on children's engagement in relational aggression, examination of the relative importance of each of these hypothesized predictors when examined together has yet to be carried out, particularly when a distinction is made between reactive and proactive relational aggression. Moreover, these cognitive and emotional qualities have not been conceptually linked within a theoretical framework to hypothesize how and why they may impact the process of engaging in relational aggression.

The current study was designed to extend the empirical literature on relational aggression in youth by investigating how individual differences in Machiavellianism, empathy, and emotion regulation predict proactive and reactive types of relational aggression in an early adolescent Canadian sample. Predictors of relational aggression were also compared to those of overt aggression to determine whether there are different factors that are important for these two forms of aggression. Limitations of past studies in this area have included grouping "bullies" together as a generic term for aggressors, failing to distinguish between subtypes based on both form and function of aggressive behaviour, and in some cases, collecting data for only one gender (i.e., females) when examining the predictors of relational aggression. The current study included both male and female participants, with the intent of exploring the possible impact of gender differences on the outcome and predictor variables of interest when subtypes of aggression are examined.

The goal of the present study was thus to determine how Machiavellianism, empathy, and emotion regulation predict relational aggression, and the proactive and reactive subtypes of relational aggression. It was hypothesised that:

1. Total relational aggression would be significantly associated with measures of empathy, emotion regulation, and Machiavellianism. After total overt aggression

was controlled for, these associations were expected to remain significant.

2. Reactive relational aggression would be significantly associated with low empathy and high emotion dysregulation, but not with Machiavellianism. These associations were expected to remain significant after controlling for proactive relational aggression. These associations were also expected to remain significant after controlling for reactive overt aggression.
3. Proactive relational aggression would be significantly associated with an opposite profile of high empathy, low emotion dysregulation, and with high Machiavellianism. These associations were expected to remain significant after controlling for reactive relational aggression. These associations were also expected to remain significant after controlling for proactive overt aggression.
4. In line with previous findings (e.g., Gini et al., 2007; Jolliffe & Farrington, 2011), low empathy was expected to emerge as a robust predictor of overt aggression measures.
5. Emotion regulation would mediate the relationship between empathy and reactive relational aggression (see Figure 3).
6. Empathy would moderate emotion regulation's expected mediating effect on the relationship between Machiavellianism and proactive relational aggression (see Figure 4).

Method

Participants

Middle school aged children were recruited from five participating schools in a public school board in southwestern Ontario, Canada. The final sample consisted of 133 children (73 females, 60 males, $M_{age} = 12.84$ years, age range: 11 – 14.42 years) from grade 6, 7, and 8 classrooms, reflecting an active consent rate (with parental permission) of over 22%. Participants were English-speaking children in regular classroom settings. One child was excluded from the original sample because English was his second language, necessitating that he complete measures that were translated in a non-standardized manner (i.e., via an online translation tool). Information about student race and ethnicity was not collected for this study. However, the population from the area in which this sample was drawn was a diverse one, with over 57% of persons self-identifying as visible minorities (Statistics Canada, 2006); the top three self-reported visible minority groups were South Asian (31.69%), Black (12.36%), and Filipino (2.78%).

An *a priori* power analysis was conducted to determine an appropriate sample size for the proposed study. A meta-analysis examining sex differences in aggression (Archer, 2004) found that the effect size of non-physical or verbal aggression was .13 in North American samples. This value for indirect aggression was measured by means of peer reports from children ranging in age from 11 to 14 years old. The age range in Archer's (2004) study encompassed the ages of intended participants in the present study's sample. With an estimated effect size of .13, in order to achieve adequate power of .80 with an alpha level of .05, using three predictor measures and multiple regression as the mode of analysis, the necessary total sample size for the present study was calculated to be 78 (Faul, Erdfelder,

Lang, & Buchner, 2007). Thus, a sample size of 133 was estimated to be more than sufficient to achieve adequate power in this study.

Procedure

Prior to the initiation of data collection for this study, all procedures and measures were reviewed and approved by the University of Ottawa's Research Ethics Board (REB) and the Research Committee of the Dufferin-Peel Catholic District School Board (DPCDSB). Following approval of teacher and student participation by each individual school's principal, the researcher circulated participation request letters and packages to teachers of grades 6 to 8 classrooms in participating schools. Teachers' participation, which included distributing these packages to students to be brought home, was detailed in a brief letter (Appendix A). Each package included a letter of invitation to participate and a consent form addressed to the student's caregiver (Appendix B), as well as a brief measure of the child's emotions and behaviours for the caregiver to complete if agreeing to participate in the study. Only those children who returned signed consent forms from their caregivers were permitted to participate. Caregivers were asked to mail completed questionnaires to the researcher in a provided self-addressed and stamped envelope so as to maintain the confidentiality of their responses and reduce the likelihood that children or teachers could review those responses.

Upon receipt of consent from caregivers and immediately prior to completion of measures in the school setting, participating students were also asked to review a letter of invitation to participate and consent form that, when signed, served as an indication of their assent (Appendix C). This document included an explanation of the study procedure and a statement indicating agreement to participate that was worded in a way that was appropriate

to the children's reading level of comprehension. Letters of invitation for both caregivers and students detailed the intent of the study, the nature and time commitment of their involvement, as well as measures taken by the researcher to ensure the confidentiality of all participants' responses. Caregivers and children were informed that the child's participation in the study was voluntary and that he or she could withdraw from participation at any time with no negative consequences to the child in the school environment.

Participating students completed a standardized battery of four pencil-and-paper, self-report measures assessing relational aggression and overt aggression, proactive and reactive aggression, empathy, and Machiavellianism during one 60 minute session. These sessions were held in the late spring of the school year. The setting used for data collection was partially dependent on the school's available classroom and staff resources at the time of testing. For example, in four of the five schools, students from all grades completed measures together in an unused classroom with the primary researcher and a supervising teacher. In the remaining school, a significantly larger number of participants necessitated the use of the school's gym, with the primary researcher and two teachers supervising completion of measures. Prior to and throughout data collection, students were advised to keep their answers confidential by refraining from discussion with other participating children and covering their completed questions. The researcher and supervising teachers and administrators monitored the classroom during completion to ensure that exchanges of information or attempts by children to look at each other's answers were promptly discouraged.

Following the completion of measures, the researcher had a brief discussion with participants that included the distribution of a short debriefing form (Appendix I). This form

explained the purpose, hypotheses, and expected results of the study in a broad and age-appropriate manner. The debriefing form was read aloud to students by the researcher and students were encouraged to ask any questions or address concerns they had about their involvement in the study at that time. It also contained the contact information of the researcher should the students or their caregivers have questions beyond those addressed in the debriefing.

Measures

Relational aggression. The Children’s Social Behaviour Scale – Self-Report (CSBS-S; Crick & Grotpeter, 1995; see Appendix D) is a 15-item self-report measure consisting of five subscales that assess: relational aggression (five items, including “Some kids try to keep certain people from being in their group when it is time to play or do an activity. How often do you do this?”); physical/overt aggression (three items, including “Some kids hit other kids at school. How often do you do this?”); prosocial behaviour (four items, including “Some kids say or do nice things for other kids. How often do you do this?”); inclusion (2 items, including “Some kids have a lot of classmates who like to play with them. How often do the kids in your class like to play with you?”); and loneliness (1 item: “Some kids wish that they had more friends at school. How often do you feel this way?”). Following previous research, the two CSBS-S physical aggression items and a verbal aggression item were combined to create one subscale measure of overt aggression. Scores for individual items on each subscale were summed to yield total relational and total overt aggression subscale scores for each participant. The prosocial behaviour, loneliness, and inclusion items and subscales were not utilized in this study.

Initially, the researcher’s intent was to assess participants’ engagement in relational

aggression using the peer nomination form of the CSBS. However, three separate school boards declined participation proposals based on concerns around the use of peer nomination data collection. A fourth school board accepted the researcher's proposal on the condition that a suitable alternative for the peer nomination measure be administered instead. A decision was made to replace the CSBS-Peer Report with the Children's Social Behavior Scale – Self-Report (CSBS-S; Crick & Grotpeter, 1995). While some researchers in the field have questioned the validity of self-report aggression data (Archer & Coyne, 2005), several researchers have found that youth relational aggression self-report measures have sound psychometric properties, such as good inter-informant reliability and test-retest reliability, and good evidence of predictive validity (see Keenan, Coyne, & Lahey, 2008; Leadbeater, Boone, Sangster, & Mathieson, 2006; Tackett, Waldman, & Lahey, 2009). One of the prime utilities of self-report data in this respect is that they have unique information that parent and even peer reports may lack in clarifying the development and manifestation of relationally aggressive behaviours (Tackett & Ostrov, 2010). This is especially important when trying to identify different subtypes of relational aggression (see Little et al., 2003; Fite et al., 2008).

Factor analyses of data on the peer format of the CSBS completed by 491 third through sixth grade children showed two distinct factors of relational and physical aggression (Crick & Grotpeter, 1995). The relational and physical aggression factors both had high factor loadings (ranging from $r = .72$ to $.91$) and non-significant cross-factor loadings (Crick & Grotpeter, 1995). Research utilizing this measure in youth samples (including seventh and ninth grade students) has also confirmed the uniqueness of the relational and physical aggression factors (Rose, Swenson, & Waller, 2004). Correlations between the two peer report subscales range from $r = .54$ to $r = .63$ (Crick & Grotpeter,

1995; Grotmeter & Crick, 1996). Both aggression subscales also have good reliability, with Cronbach's alpha coefficients ranging from $r = .82$ to $.89$ for the relational aggression subscale and $r = .94$ to $.97$ for the physical aggression subscale (Werner & Crick, 2004). Test-retest reliabilities over a 4-week interval are good, with correlation coefficients of $r = .84$ and $r = .92$ for relational and physical aggression subscales, respectively (Crick, 1996, 1997).

For the self-report version of the CSBS, the relational and physical aggression subscales have also been shown to have good reliability and internal consistency in past research, with Cronbach's alpha coefficients of $r = .73$ for the relational aggression subscale and $r = .82$ for the physical aggression subscale (Crick & Grotmeter, 1995; Crick, 1996). In a study using four of the five CSBS-S relational aggression items, test-retest reliability over a 7-day period was adequate, with a correlation coefficient of $r = 0.69$ (Keenan, Coyne, and Lahey, 2008). An expanded, revised version of the CSBS-S has shown, similar to previous findings, that the relational and physical/overt aggression subscales are significantly correlated ($r = .51$; Marsee, Silverthorn, & Frick, 2005). Strong evidence for construct and predictive validity has been shown in a number of studies. For example, relational aggression as measured by the CSBS-S is significantly associated with a number of facets of social-psychological maladjustment in youth, including loneliness, peer isolation, peer rejection (Crick & Grotmeter, 1995), depression, anxiety, and engaging in future bully-victim aggression (Swearer et al., 2004), even when overt aggression scores were held constant. For the present study's sample, Cronbach's alpha coefficients for relational aggression and overt aggression subscales were $r = .74$ and $r = .80$, respectively. The relational aggression and overt aggression subscales were also significantly correlated, $r = .50$ ($p < .01$).

Reactive and proactive aggression. The measure of reactive and proactive aggression (herein referred to as the Reactive and Proactive Aggression Questionnaire; RPAQ) was a 36-item self-report questionnaire constructed in order to separate the different forms (relational and overt) and functions (reactive and proactive/instrumental) of aggression (Little, Jones, Henrich, & Hawley, 2003; see Appendix E). The measure consists of six subscales of 6 questions each. These subscales differentiate between pure overt aggression (e.g., “I’m the kind of person who hits, kicks, or punches others”), overt-reactive aggression (e.g., “If others make me mad or upset, I often hurt them), overt-instrumental aggression (e.g., “I often threaten others to get what I want”), pure relational aggression (e.g., “I’m the kind of person who gossips or spreads rumours”), relational-reactive aggression (e.g., “If others upset or hurt me, I often tell my friends to stop liking them”), and relational-instrumental aggression (e.g., “To get what I want, I often tell others I won’t be their friend anymore”). Each item is coded on a 4-point scale, where a rating of 1 indicates an item being “not at all true” for a participant and a rating of 4 indicates an item being “completely true” for a participant. In the tradition of previous reactive/proactive aggression measures, scores on each of the subscale’s items can be summed and divided by the number of items to create six separate mean subscale scores, where higher scores indicate higher levels of engaging in different forms and functions of aggression.

For the purposes of the present study, four subscales were used in order to measure participants’ propensities for engaging in different subtypes of aggression: overt-reactive, overt-instrumental, relational-reactive and relational-instrumental. While Crick (1997) and Little and colleagues’ (2003) measures overlap significantly, both questionnaires were utilized in the present study because of the different perspectives they consider. Specifically,

Crick's (1997) measure examines prevalence and frequency of engaging in different types of aggressive behaviours (i.e., the overt versus relational forms of aggression alone), whereas Little and colleagues' (2003) measure is meant to examine the personal intent behind various forms of aggressive behaviour. Moreover, Little et al.'s (2003) scale focuses specifically on the differentiation of proactive and reactive functions within the relational and overt forms of aggression. Previous measures assessed a participant's use of reactive aggression and proactive aggression, but did not distinguish between forms of aggression, and often focused on physical or verbal forms of aggression to the virtual exclusion of relational aggression (e.g., "Had fights with others to show who was on top", "Used physical force to get others to do what you want"; Raine et al., 2006).

With regards to psychometric properties, previous factor analyses have found that the hypothesized four-factor model of this measure (composed of overt/instrumental, overt/reactive, relational/instrumental, and relational/reactive constructs of aggression) demonstrated stronger goodness of fit than simpler two-factor (overt and relational) or three factor (overt, relational, and combined) models). This was the case across age cohorts (grades 5-7 vs. grades 8-10), gender, and ethnicity. Overt and relational aggression shared 69% of the reliable variance in this measure (reflecting previous findings of the correlation between the two constructs; Crick & Grotpeter, 1995; Grotpeter & Crick, 1996), while correlations between reactive and proactive scores were far lower ($r = -.10$; Little et al., 2003). Little and colleagues (2003) also reported that all items demonstrated consistent patterns of discriminant and convergent validity. Criterion validity was demonstrated via regression analyses with self-report measures tapping hostility (where the reactive/proactive measure accounted for 55% of the unique variance in scores), frustration intolerance (26% of

unique variance explained), and negative influence (65% of unique variance explained), and with peer-report measures tapping antisocial behaviour (15% of unique variance explained; see Little et al., 2003 for further detail).

Several studies have reported that the internal reliability of subscales range from $r = .62$ to $.93$ (Little et al., 2003; Fite, Stauffacher, Ostrov, & Colder, 2008; Fite, Stoppelbein, Greening, & Gaertner, 2009). Furthermore, confirmatory factor analyses of Little et al.'s (2003) model using samples of American children (as the original analyses were conducted on data collected with children and adolescents from Berlin, Germany) replicated the model, with all indicators loading significantly on their respective factors (Fite et al., 2008; Fite et al., 2009). Partial convergent validity was demonstrated with Dodge and Coie's (1987) measure of proactive and reactive aggression, with the proactive subscale of the Dodge and Coie (1987) measure being a significant predictor of Little et al.'s (2003) proactive and reactive aggression scale. Reliability analyses for the present study's sample resulted in Cronbach's alpha coefficients of $r = .90$ for the full measure, and subscale reliabilities ranging from $.79$ to $.88$.

Machiavellianism. The Kiddie Mach Scale (Christie & Geis, 1970) is a 20-item self-report measure that assesses a child's tendency to deceive and manipulate others in interpersonal relationships to achieve desired goals (see Appendix F). Examples of items include "The best way to get along with people is to tell them things that make them happy", "Sometimes you have to cheat a little to get what you want", and "Sometimes you have to hurt other people to get what you want". Statements were rated by participants on a 5-point scale, with a score of 5 indicating "agree very much", 4 indicating "agree a little", 3 indicating a neutral response, 2 indicating "disagree a little", and 1 indicating "disagree very

much". High total scores indicated higher Machiavellian beliefs and tendencies. Some items (ten in total: 2, 4, 6, 9, 10, 11, 14, 16, 17, and 19) were reverse scored before summing the values to calculate a composite score, allowing for a range of scores from 20 to 100.

Christie and Geis (1970) reported a split-half reliability coefficient of $r = .43$ and a test-retest reliability coefficient of $r = .87$ over a two-week interval for this child modification of the original Mach IV. More recent investigations of the psychometric properties of the Kiddie Mach scale produced internal consistency scores from $r = .63$ to $.79$ (Andreou, 2004; Sutton & Keogh, 2001). A factor analysis of the responses of 186 fourth to sixth-grade children yielded four factors and accounted for 38.44% of the variance in responses (Andreou, 2004). The four factors were labelled Lack of Faith in Humanity (composed of items related to positive/negative beliefs about human nature), Manipulation (composed of items related to the legitimacy of interpersonal manipulation to achieve desired goals), Dishonesty (composed of items related to honesty), and Distrust (composed of items related to trust).

Construct validity was demonstrated by Sutton and Keogh (2000), who found scores on the Kiddie Mach were significantly associated with a measure of desire for social success ($r = .48$). Predictive validity was demonstrated with total Machiavellian scores being significantly and positively associated with both bullying and victimization measures ($r = .39$, for boys only and $r = .34$ respectively); this was expected in that the bullying and victimization measures captured responses of children who both bully others and are bullied themselves (i.e., bully/victims). Previous research has suggested that bully/victims' high scores on Machiavellianism reflect their negative perceptions of others in the world in response to being bullied (i.e., Lack of Faith in Humanity), coinciding with Machiavellian

interpersonal strategies to deal with others (Andreou, 2001). Girls' scores on the manipulation factor of the Kiddie Mach ($r = .29$) and boys' scores on the lack of faith factor were significantly associated with bullying behaviour ($r = .37$; Andreou, 2004). Considering the gender differences found regarding the relation between measures tapping bullying behaviour and factors on the Kiddie Mach scale (Andreou, 2004), analyses in the present study were planned to examine both the contribution of the overall Machiavellianism score to predicting levels of relational aggression, as well as the potential association of scores on the four individual factors of the Kiddie Mach measure to the proactive and reactive relational aggression constructs. However, reliability estimates for the four subscales were poor (Cronbach's alpha coefficients ranging from $r = .31$ to $r = .38$), and exploratory factor analyses did not confirm previously reported factor structures for this sample. For this reason, the total scale score alone was utilized in analyses for the present study. Scores in this sample ranged from 33 to 77, and the Cronbach's alpha was .68 for the total scale score.

Empathy. Davis' (1980, 1983) Interpersonal Reactivity Index (IRI) is a 28-item, multidimensional self-report measure designed to assess the affective and cognitive components of empathy across four 7-item subscales: Perspective-taking (PT), Fantasy (FS), Empathic Concern (EC), and Personal Distress (PD; see Appendix G). The perspective-taking subscale assesses the cognitive component of empathy with regards to the ability to take the psychological stance of others, and includes such items as "I believe that there are two sides to every question and try to look at them both" and "I sometimes try to understand my friends better by imagining how things look from their perspective". The empathic concern subscale measures the affective component of empathy by assessing the ability to experience feelings of compassion and concern for others in distress, and includes items such

as “I would describe myself as a pretty soft-hearted person” and “Sometimes I don't feel very sorry for other people when they are having problems” (reverse scored). The two other subscales, fantasy (FS) and personal distress (PD), assess the tendency to take the perspective of others in imaginary situations (e.g., “I really get involved with the feelings of the characters in a novel.”), and the inclination to experience substantial personal unease in response to the distress of others (e.g., “When I see someone who badly needs help in an emergency, I go to pieces”). Scores for each of the four subscales and the total score of the IRI were calculated. However, separate subscales had lower than generally acceptable levels of internal reliability (Nunnally, 1978); Cronbach's alpha levels ranged from .41 to .62. Following the summation method employed in previous studies (e.g., Burke, 2001; Cliffordson, 2002; Parker, 2007), the total scale score (Cronbach's alpha $r = .76$) was used as a global indicator of empathy in the present study.

Items were scored on a scale that ranged from 0 (“does not describe me well”) to 4 (“describes me very well”). Items were summed with a total possible score ranging from 0 to 112 (0 to 4 points per answer), with high scores indicating greater empathy. Items 3, 4, 7, 12, 13, 14, 15, 18, and 19 were reverse-scored. Davis (1983) reported satisfactory internal consistency and test-retest reliabilities for the four subscales, with alpha coefficients ranging from .71 to .77 and test-retest reliabilities ranging from .62 to .71. Validity was demonstrated by correlating the IRI with one-dimensional empathy measures such as the Hogan Empathy Scale (1996) and Mehrabian and Epstein's (1972) Questionnaire Measure of Emotional Empathy (QMEE), yielding coefficients that ranged from $r = .37$ to .42 for perspective-taking; $r = .12$ to .36 for personal distress; $r = .48$ to .56 for fantasy; and $r = .56$ to .63 for empathic concern (Davis, 1983). Discriminant validity was also demonstrated by comparing

scores on the scale with intelligence, as measured by the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1955); the two measures were uncorrelated (the one exception being that WAIS Vocabulary was related to the fantasy subscale for women only; $r = .28$; Davis, 1983).

The IRI has been used in research with samples of children who engage in bullying and aggressive interactions with school peers (Gini et al., 2007), as well as with young adults who use relational aggression in their peer relationships (Loudin et al., 2003). The predictive validity of the empathic concern subscale of this measure has been demonstrated by the fact that children who engage in bullying behaviours have been found to have significantly lower levels of empathic responsiveness (Gini et al., 2007). For example, girls who reported using indirect aggression to bully peers scored lower on measures of empathic concern than their peers (Jolliffe & Farrington, 2006). Low levels of empathic concern were also associated with higher levels of bullying in males; however, there was no evidence of poor perspective taking skills being associated with the bullying behaviour of either gender in these studies (Jolliffe & Farrington, 2011). Nevertheless, research with this scale has found that, as youth proceed into college and young adulthood, stronger perspective taking skills are associated with lower levels of relational aggression, and lower levels of empathic concern are associated with higher levels of relational aggression (Loudin et al., 2003).

Emotion regulation. The Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1995) is a 24-item measure of children's emotion regulation that is completed by an adult caregiver familiar with the child (see Appendix H). The measure examines affective processes such as lability, intensity, valence, flexibility and situational appropriateness. Items tap regulation of both positive and negative emotions, and caregiver ratings of the frequency

of various child emotional behaviours are scored on a four-point Likert scale, where 1 indicates “never”, 2 indicates “sometimes”, 3 indicates “often” and 4 indicates “almost always”. The predictive validity of the scale is good. The ERC has been shown to discriminate among children who have been labelled as bullies, those who have been mistreated, and those who have low levels of behaviour problems, thus indicating that it is sensitive to group differences (Shields & Cicchetti, 1998; 2001). In a study of fourth and fifth grade Chinese children (Xu & Zhang, 2008), scores on the ERC discriminated between children who were teacher-nominated users of proactive aggression versus teacher-nominated users of reactive aggression. Specifically, reactively aggressive children were found to be significantly more emotionally dysregulated than their proactively aggressive peers. Emotion regulation skills mediated the relationship between maltreatment and peer interactions, with higher emotion regulation scores predicting higher peer acceptance for children later on (Kim & Cicchetti, 2010). Evidence for the convergent validity of the scale has been demonstrated in past research through significant positive correlations with the Emotion Regulation Q-Scale (Shields & Cicchetti, 1997).

Factor analysis using data collected from 513 maltreated and impoverished children ranging in age from 6 to 12 years old yielded two factors, lability/negativity and emotion regulation (Shields & Cicchetti, 1997). The lability/negativity (LN) factor is composed of 15 items that tap mood lability, lack of emotional flexibility, and dysregulated negative emotions (examples of items include “Is easily frustrated” and “Exhibits wide mood swings”). The emotion regulation (ER) factor is composed of 9 items that tap situationally appropriate displays of emotion, empathy, and emotional self-awareness (examples of items include “Responds positively to neutral or friendly overtures by adults” and “Can say when

s/he is feeling sad, angry, or mad, fearful, or afraid”). A composite score that portrays processes related to both lability/negativity and emotion regulation can also be calculated by totalling scores on each item after reverse scoring the relevant items (five in total: 4, 5, 9, 11, 16, and 18). The internal consistency for the composite score was reported to be $r = .89$ (Shields & Cicchetti, 1997).

Internal consistency for the two factors is good, with Cronbach’s alpha coefficients of $r = .96$ for lability/negativity and $r = .83$ for emotion regulation. The two subscales are moderately negatively correlated ($r = -.50$), with high scores on the lability/negativity scale reflecting greater dysregulation, while higher scores on the emotion regulation scale are meant to reflect greater regulation. Indeed, Lotze, Ravindran, and Myers (2010) noted that the L/N subscale is primarily a measure of poor emotion regulation, due to its focus on lability, rigidity and dysregulated negative affect. The emotion regulation subscale items assess situational regulatory behaviours, but also focus on abilities that appear to go beyond emotion regulation as a distinct construct, such as empathy and emotional self-awareness. These constructs were assessed by an empathy measure in the present study (and as such the emotion regulation subscale could conceivably serve not only as a measure of emotion regulation but also as a measure of empathy). Furthermore, the L/N subscale items of the ERC were more strongly in line with the present study’s conceptualization of emotion regulation as emotional flexibility and lability (Shields & Cicchetti, 1997) and as such it was decided that only the Lability/Negativity subscale would be used as the measure of emotion regulation (Cronbach’s alpha coefficient $r = .69$). Parent- and teacher –rated lability/negativity scores significantly predicted children’s aggressive/disruptive scores on a peer nomination measure of social behaviour in previous research (Puddester, 2011).

Results

Preliminary Analyses

Prior to planned correlational or regression analyses, all study variables were examined for accuracy of data values, missing data, normality of distribution, and assumptions of multivariate analysis. All data points were within specified ranges for their respective variables and measures, and were valid individual values and score combinations.

Some analyses reported herein were limited to samples with complete self- and parent-report data. As the return rate of caregiver-completed ERC questionnaires was 70.6%, a missing values analysis (MVA) was carried out to examine the pattern of missing data. A series of separate variance t-test analyses determined that there was no systematic relationship between missing adult responses and demographic variables or main study variables (i.e., participating children's responses; $p < .05$). Reported analyses were conducted with imputed data using the expectation minimization (EM) method. Missing data points were estimated and imputed for variables where less than five percent of items per measure were missing. These included the RPAQ reactive overt aggression subscale score, the RPAQ proactive overt aggression subscale score (both with 0.8% of items missing), the empathy total scale score (2.3% missing), and the Machiavellian total scale score (3.8% missing). In order to maximize the strength of the predicted imputed values, all variables of study were utilized in the EM algorithm.

Linearity and homoscedasticity checks of all study variables found a number of non-normally distributed variables. However, examination of variable distributions found that CSBS total overt aggression and total emotion regulation were kurtotic, and CSBS total relational aggression was positively skewed and kurtotic. RPAQ proactive overt aggression

and RPAQ proactive relational aggression were highly positively skewed and kurtotic. As such, square root transformations were calculated for CSBS total overt aggression and CSBS total relational aggression. Inverse transformations were computed for RPAQ proactive overt aggression and RPAQ proactive relational aggression. These transformed variables were compared to former variables. The normality of the distributions was improved significantly for all transformed variables; therefore, these transformations were included in analyses. Tables and graphs present untransformed CSBS and RPAQ values.

Prior to regression analyses, the ratio of cases to independent variables was evaluated following Tabachnik and Fidell's (2001) suggested guidelines to evaluate the power of analyses. Using their formula of $N \geq 50 + 8m$ (where m = number of independent variables), the suggested $N = 98$ (for testing regression with 6 predictor variables, $N = 50 + 8(6)$) is below the 133 participants in this study. Thus, the power of analyses seems to have been sufficient.

Variables were also evaluated for evidence of multivariate outliers, multicollinearity, and singularity. The presence of multivariate outliers was explored by inspecting Mahalanobis distances, using Tabachnik and Fidell's (2001) guidelines to determine critical chi-square values for comparison. With six independent variables and a critical χ^2 value of 22.46, no examined cases exceeded this value. Following standard guidelines, preliminary regression analyses showed no evidence of multicollinearity or singularity (Tabachnik & Fidell, 2001). Bivariate correlations did not exceed $r = .70$, Tolerance levels were above .10 for all main study variables, and all study variables' Variance Inflation Factors (VIFs) were below 10. Casewise diagnostics via standardised residual values did not indicate any

dependent variable outliers. All cases were retained, and the final sample consisted of $N = 133$ participants.

Descriptive Analyses

Means, standard deviations, ranges, and internal consistency estimates of major continuous study variables are presented in Table 1. Results of paired-sample t -tests comparing mean aggression subscale scores are also presented.

Table 1

Psychometric Properties of Study Variables

Variable	M	SD	Cronbach's α	Range Statistic
CSBS Total Relational	9.13 ^a	2.92	.74	14.00
CSBS Total Overt	6.36	2.45	.80	12.00
RPAQ Proactive Relational	1.31 ^b	0.51	.83	3.50
RPAQ Proactive Overt	1.22	0.42	.84	2.17
RPAQ Reactive Relational	2.19 ^c	0.73	.79	3.50
RPAQ Reactive Overt	2.32 ^d	0.90	.88	4.00
Empathy	59.61	12.80	.75	62.00
Machiavellianism	53.30	8.50	.68	44.00
Emotion Regulation (Lability/Negativity) ^e	27.60	5.00	.69	23.00

^aSignificantly higher than CSBS Total Overt, $t(132) = 11.65, p < .001$. ^bSignificantly higher than RPAQ Proactive Overt, $t(132) = 2.44, p < .05$. ^cSignificantly higher than RPAQ Proactive Relational, $t(132) = 17.41, p < .001$. ^dSignificantly higher than RPAQ Proactive Overt, $t(132) = 15.17, p < .001$. ^e $n = 90$. All other variables $n = 133$.

One-sample t-test analyses examining the distribution of participants determined that significantly more female students than male students participated, $t(132) = 33.505, p < .001$. Significantly more grade 7 students participated than grade 6 or grade 8 students, $t(132) = 33.216, p < .001$. The number of participants across the five schools differed significantly as well, $t(132) = 30.367, p < .001$; these disparities, however, did not translate to significant differences between groups on predictor or outcome variables. Table 2 presents the sample distribution by grade and gender.

Table 2

Sample Size by Gender and Grade

		Gender of the child		
		Female	Male	Total By Grade
Grade level	Grade 6	17 (23.3%)	12 (20%)	29 (21.8%)
	Grade 7	31 (42.5%)	30 (50%)	61 (45.9%)
	Grade 8	25 (34.2%)	18 (30%)	43 (32.3%)
Total By Gender	73 (54.9%)	60 (45.1%)	133	

Intercorrelations among untransformed, major study variables are presented in Table 3. Zero-order correlations between relational aggression and overt aggression were examined for CSBS total aggression, RPAQ proactive aggression, and RPAQ reactive aggression measures. Consistent with previous research (Crick & Grotpeter, 1995; Grotpeter & Crick, 1996; Little et al., 2003; Fite et al., 2008), CSBS total relational aggression and CSBS total

overt aggression were significantly positively correlated, as were RPAQ proactive relational aggression and RPAQ proactive overt aggression, and RPAQ reactive relational aggression and RPAQ reactive overt aggression. As expected, scores on CSBS total relational aggression were significantly, positively associated with RPAQ reactive relational aggression and RPAQ proactive relational aggression. Machiavellianism was negatively associated with empathy and positively associated with emotion dysregulation.

Table 3

Correlations Among Variables (Using Untransformed Scores)

Variable	1	2	3	4	5	6	7	8
1. CSBS Total Relational	-							
2. CSBS Total Overt	.50**	-						
3. RPAQ Reactive Relational	.29**	.17*	-					
4. RPAQ Reactive Overt	.22**	.48**	.51**	-				
5. RPAQ Proactive Relational	.26**	.12	.61**	.23**	-			
6. RPAQ Proactive Overt	.27**	.35**	.43**	.38**	.64**	-		
7. Empathy	-.07	-.36**	-.10	-.47**	.05	-.17	-	
8. Machiavellianism	.30**	.35**	.33**	.49**	.25**	.27**	-.38**	-
9. Emotion Regulation (Lability/Negativity)	.08	.14	.16	.05	.18	.11	-.05	.25*

Note. Statistically significant correlation coefficients are in boldface.

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

While separate subscale scores for empathy were not included in regression analyses due to their low internal reliability, exploratory correlational analyses were run to examine the relationship between empathic concern and perspective-taking subscales and aggression measures (Table 4).

Table 4

Correlations Between Empathy Subscales and Aggression

Aggression Measure	Empathic Concern	Perspective Taking
Total Relational	-.18*	-.16
Total Overt	-.31**	-.35**
Reactive Relational	-.13	-.28**
Reactive Overt	-.40**	-.50**
Proactive Relational	-.06	-.05
Proactive Overt	-.19*	-.21*

Note. Statistically significant correlation coefficients are in boldface.

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

Consistent with previous research (e.g., Jolliffe & Farrington, 2004; Lovett & Sheffield, 2007; de Wied, Branje, & Meeus, 2007), empathic concern was significantly inversely correlated with multiple indices of aggression, including CSBS total relational aggression and all overt aggression measures. Lower perspective taking skills were associated with higher overt aggression and reactive aggression indices, but not with higher total relational aggression. In line with previous patterns (e.g., Batanova & Loukas, 2011), high total relational aggression was significantly correlated with lower empathic concern, but

not with perspective taking skills. Proactive relational aggression had no significant association with empathic concern or perspective taking scores.

Gender and Grade Differences

Group differences on predictor and overt aggression variables were explored using independent samples t-test and multivariate ANOVA analyses. A significant effect of gender was found for the total empathy score, $t(131) = 4.705$, $p < .001$, eta squared = .14 (using a Bonferroni adjusted alpha level of .004). Females scored higher ($M = 64$, $SD = 11.77$) on total empathy than males ($M = 54.26$, $SD = 12$). A significant effect of gender was also found for RPAQ reactive overt aggression, $t(131) = -3.329$, $p < .001$, eta squared = .09, where males scored themselves higher ($M = 2.60$, $SD = .98$) than females ($M = 2.10$, $SD = .77$). There was no significant effect for grade on any of the main predictor variables as evaluated via multivariate ANOVA analyses. Contrary to some previous research findings with aggression measures (e.g., Crick, 1997; Crothers, Field, & Kolbert, 2005; Talbott, Celinska, Simpson, & Coe, 2002; Little et al., 2003; Herrenkohl et al., 2007; Fite et al., 2008; Fite et al., 2009), multivariate ANOVA analyses also found no statistically significant effects for grade or gender on any of the relational aggression outcome variables. Given the lack of significant differences in predictor or outcome variables as a function of grade, this variable was not included in further analyses.

Regression Analyses

A series of hierarchical regression analyses were used to examine hypotheses 1, 2, and 3. The dependent variables for these analyses were CSBS total relational aggression, RPAQ reactive relational aggression, and RPAQ proactive relational aggression. Following procedures previously employed in the relational aggression literature (e.g., Batanova &

Loukas, 2011; Marsee et al., 2011; Kerig & Stellwagern, 2010; Lotze, Ravindran, & Myers, 2010; Werner, 2012), overt aggression measures were entered on the first step of hierarchical analyses. These served to partial out the effect of overt aggression on relational aggression before empathy, emotion regulation, and Machiavellianism were entered in step 2. Table 21 summarizes the findings of these hierarchical regressions for relational aggression.

Empathy, Machiavellianism, and emotion regulation as predictors of total relational aggression. Hypothesis 1 predicted that CSBS total relational aggression scores would be predicted by participants' scores on measures of empathy, Machiavellianism, and emotion regulation. A standard multiple regression analysis (Table 5) was first run using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores as independent variables to predict the dependent variable of CSBS total relational aggression. The regression model was significant, accounting for 9.5% of the variance in CSBS total relational aggression. Machiavellianism as an independent variable contributed significantly to this model ($p < .01$).

Table 5

Standard Multiple Regression Analysis Predicting Total Relational Aggression From Empathy, Emotion Regulation, and Machiavellianism

Measures	<i>B</i>	<i>SE B</i>	β	<i>F</i> (3, 86)	<i>R</i> ²
Empathy	.00	.01	.04		
ER	.00	.00	.03		
Mach	.02	.00	.32**	3.00*	.10*

Note. ER = Emotion Regulation. Mach = Machiavellianism.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Hierarchical Multiple Regression Analysis Predicting Total Relational Aggression, Controlling for Gender and Total Overt Aggression

Measures	β	<i>SE B</i>	R^2	<i>F</i>	ΔR^2	ΔF	<i>t</i>
Step 1							
Gender	-.11	.09					
Total Overt Aggression	.52***	.09	.27***	15.87***	.27***	9.73***	5.62***
Step 2							
Gender	-.08	.10					
Total Overt Aggression	.50***	.10					4.93***
Empathy	.14	.00					
ER	-.01	.01					
Mach	.19 ^a	.01	.30	6.38***	.03	1.35	1.82 ^a

Note. ER = Emotion Regulation. Mach = Machiavellianism.

^aFindings approached significance, $p < .10$

* $p < .05$. ** $p < .01$. *** $p < .001$.

A hierarchical regression analysis was then carried out to examine whether these associations remained significant after CSBS total overt aggression was controlled for (Table 6). In light of the significant effect of gender for empathy as an independent variable, both CSBS total overt aggression and gender were entered in step 1 of the regression analysis as a group. These variables accounted for a significant portion of the variance (26.7%) in CSBS total relational aggression, $F(2, 87) = 15.87, p < .001$, with CSBS total overt aggression significantly predicting CSBS total relational aggression, $t(87) = 5.62, p < .001$. As with the first hierarchical regression analysis, the combination of empathy, emotion regulation, and Machiavellianism when entered in step 2 as a group did not explain significant additional

variance in total relational aggression. CSBS total overt aggression remained a significant predictor of CSBS total relational aggression scores in the full model, while

Machiavellianism approached significance as a univariate predictor, $t(84) = 1.82, p < .10$.

Empathy, Machiavellianism, and emotion regulation as predictors of reactive relational aggression. Hypothesis 2 predicted that RPAQ reactive relational aggression would be significantly predicted by low empathy and high emotion dysregulation (i.e., low lability/negativity measure scores), but not Machiavellianism. These associations were expected to remain even after the influence of proactive relational aggression scores had been accounted for and after proactive overt aggression scores had been accounted for. Due to the significant correlation between RPAQ reactive relational aggression and Machiavellianism ($r = .33, p < .001$), Machiavellianism was also included in the regression model as an independent variable. First, a standard multiple regression analysis using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores as independent variables to predict the dependent variable of RPAQ reactive relational aggression was performed (Table 7). The regression model was significant, accounting for 12% of the variance in RPAQ reactive relational aggression. Machiavellianism was the only independent variable that contributed significantly to this model ($p < .01$).

Hierarchical regression analyses were computed to explore the predictive power of these emotional and cognitive correlates within form and across function, when controlling for proactive relational aggression. Taking into account the significant effect of gender for empathy (as an independent variable), both RPAQ proactive relational aggression and gender were entered into step 1 of the analyses (Table 8).

Table 7

Standard Multiple Regression Analysis Predicting Reactive Relational Aggression From Empathy, Emotion Regulation, and Machiavellianism

Measures	<i>B</i>	<i>SE B</i>	β	<i>F</i> (3, 86)	<i>R</i> ²
Empathy	.00	.01	.04		
ER	.01	.01	.08		
Mach	.03	.01	.33**	3.89*	.12

Note. ER = Emotion Regulation. Mach = Machiavellianism.

p* < .05. *p* < .01. ****p* < .001.

Table 8

Hierarchical Multiple Regression Analysis Predicting Reactive Relational Aggression, Controlling for Gender and Proactive Relational Aggression

Measures	β	<i>SE B</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	<i>t</i>
Step 1							
Gender	.01	.13					
Proactive Relational	-.60***	.31	.36***	24.56***	.36	24.56***	5.67***
Step 2							
Gender	-.05	.14					
Proactive Relational	-.55***	.33					-6.11***
Empathy	-.07	.01					
ER	-.00	.01					
Mach	.16	.01	.40	11.03***	.04	1.65	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

p* < .05. *p* < .01. ****p* < .001.

Table 9

Hierarchical Multiple Regression Analysis Predicting Reactive Relational Aggression, Controlling for Gender and Reactive Overt Aggression

Measures	β	<i>SE B</i>	R^2	<i>F</i>	ΔR^2	ΔF	<i>t</i>
Step 1							
Gender	-.23**	.14					-2.47**
Reactive Overt	.57***	.08	.31***	19.24***	.31***	19.24***	6.15***
Step 2							
Gender	-.17	.15					
Reactive Overt	.57***	.09					5.16***
Empathy	.16	.00					
ER	.08	.01					
Mach	.12	.01	.34	8.57***	.03	1.31	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

* $p < .05$. ** $p < .01$. *** $p < .001$.

A second hierarchical regression analysis was carried out to examine the predictor variables' association with RPAQ reactive relational aggression. Given the significant effect of gender for reactive overt aggression, both RPAQ reactive overt aggression and gender were entered as a group in step 1 of the analyses. These variables accounted for a significant portion of the variance (30.7%) in RPAQ reactive relational aggression, $F(2, 87) = 19.24, p < .001$, and were both significant univariate predictors (Table 9). The full regression model showed that empathy, emotion regulation, and Machiavellianism entered as a block in step 2 did not explain significant additional variance in reactive relational aggression after the effects of reactive overt aggression and gender had been accounted for. Neither empathy, nor emotion regulation, nor Machiavellianism emerged as significant univariate predictors.

RPAQ reactive overt aggression was the only significant predictor of reactive relational aggression in the full model.

Table 10

Hierarchical Multiple Regression Analysis Predicting Reactive Relational Aggression, Controlling for Gender and Cross-Subtype Aggressions

Measures	β	<i>SE B</i>	R^2	<i>F</i>	ΔR^2	ΔF	<i>t</i>
Step 1							
Gender	-.13	.12					
Reactive Overt	.42***	.07					5.04***
Proactive Relational	-.48***	.29	.51***	29.45***	.51***	29.45***	-5.91***
Step 2							
Gender	-.10	.13					
Reactive Overt	.43***	.08					4.40***
Proactive Relational	-.46***	.31					-5.41***
Empathy	.07	.00					
ER	.03	.01					
Mach	.03	.01	.51	14.42***	.00	.20	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 10 presents the results of a hierarchical regression analysis holding both proactive relational aggression and reactive overt aggression constant in the prediction of reactive relational aggression. Gender, RPAQ reactive overt aggression and RPAQ proactive relational aggression accounted for a significant portion of variance when entered in step 1, $F(3, 86) = 29.45, p < .001$. Reactive overt and proactive relational aggressions were both

significant univariate predictors. Consistent with above analyses, the emotional and cognitive correlates entered in step 2 of the analyses did not account for additional unique variance in reactive relational aggression above control variables as a group or as univariate predictors.

Empathy, Machiavellianism, and emotion regulation as predictors of proactive relational aggression.

The final series of relational aggression regression analyses examined whether proactive relational aggression would be significantly predicted by low empathy, low emotion dysregulation (i.e., high lability/negativity scores), and high Machiavellianism, even after accounting for the effects of reactive relational aggression and proactive overt aggression.

A standard multiple regression analysis using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores as independent variables to predict the dependent variable of RPAQ proactive relational aggression was significant, accounting for 11.4% of the variance in the dependent variable (Table 11). Machiavellianism was again the independent variable that contributed significantly to this model ($p < .01$).

Table 11

Standard Multiple Regression Analysis Predicting Proactive Relational Aggression From Empathy, Emotion Regulation and Machiavellianism

Measures	<i>B</i>	<i>SE B</i>	β	<i>F</i> (3, 86)	<i>R</i> ²
Empathy	-.00	.00	-.16		
ER	-.01	.00	-.13		
Mach	-.01	.00	-.30**	3.67*	.11*

Note. ER = Emotion Regulation. Mach = Machiavellianism.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 12 shows the results of hierarchical regression analyses related to Hypothesis 3. RPAQ reactive relational aggression and gender accounted for a significant portion of the variance (36.8%) in RPAQ proactive relational aggression when entered in step 1, $F(2, 87) = 25.31, p < .001$. Reactive relational aggression was the only significant univariate predictor in this step, $t(87) = -6.96, p < .001$), consistent with the analyses above. Contrary to predictions, the addition of empathy, emotion regulation, and Machiavellianism scores in step 2 did not contribute significant additional variance in RPAQ proactive relational aggression. RPAQ reactive relational aggression remained the only significant predictor of RPAQ proactive relational aggression in the full model.

Table 12

Hierarchical Multiple Regression Analysis Predicting Proactive Relational Aggression, Controlling for Gender and Reactive Relational Aggression

Measures	β	SE B	R^2	F	ΔR^2	ΔF	t
Step 1							
Gender	.08	.04					
Reactive Relational	-.60***	.02	.37***	25.31***	.37***	25.31***	-6.96***
Step 2							
Gender	.04	.04					
Reactive Relational	-.56***	.03					-6.11***
Empathy	-.12	.00					
ER	-.10	.00					
Mach	-.12	.00	.40	10.82***	.02	1.10	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

* $p < .05$. ** $p < .01$. *** $p < .001$.

A second hierarchical regression analysis was conducted with RPAQ proactive overt aggression and gender entered as a control set of variables in step 1 (Table 13). These variables accounted for a significant portion of the variance (28.1%) in RPAQ proactive relational aggression, $F(2, 87) = 17.01, p < .001$. Proactive overt aggression was a significant univariate predictor, $t(84) = 5.67, p < .001$. Contrary to predictions, the addition of empathy, emotion regulation, and Machiavellianism in step 2 did not account for a significant amount of unique variance in proactive relational aggression over that accounted for by the control variables. However, these variables did approach significance with an additional 6.2% of unique variance accounted for ($p < .10$).

Table 13

Hierarchical Multiple Regression Analysis Predicting Proactive Relational Aggression, Controlling for Gender and Proactive Overt Aggression

Measures	β	$SE B$	R^2	F	ΔR^2	ΔF	t
Step 1							
Gender	.16	.04					
Proactive Overt	.52***	.10	.28***	17.01***	.28	17.01***	5.67***
Step 2							
Gender	.09	.04					
Proactive Overt	.50***	.10					5.33***
Empathy	-.20 ^a	.00					-1.95 ^a
ER	-.10	.00					
Mach	-.20*	.00	.34	8.78***	.06	2.65 ^a	-2.00*

Note. ER = Emotion Regulation. Mach = Machiavellianism.

^aFindings approached significance, $p < .10$

* $p < .05$. ** $p < .01$. *** $p < .001$.

Moreover, in addition to proactive overt aggression scores contributing significantly to the full model, Machiavellianism was a significant predictor, $t(84) = -2.00, p < .10$. Empathy approached significance as univariate predictor, $t(84) = -1.95, p < .10$.

Table 14

Hierarchical Multiple Regression Analysis Predicting Proactive Relational Aggression, Controlling for Gender and Cross-Subtype Aggressions

Measures	β	SE B	R^2	F	ΔR^2	ΔF	t
Step 1							
Gender	.12	.03					
Reactive Relational	-.46***	.02					-5.15***
Proactive Overt	.32***	.01	.45***	23.51***	.45***	23.51***	3.60***
Step 2							
Gender	.05	.04					
Reactive Relational	-.43***	.03					-4.68***
Proactive Overt	.34***	.10					3.76***
Empathy	-.18 ^a	.00					-1.91 ^a
ER	-.08	.00					
Mach	-.10	.00	.48	12.78***	.03	1.58	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

^aFindings approached significance, $p < .10$

* $p < .05$. ** $p < .01$. *** $p < .001$.

Finally, a hierarchical regression analysis controlling for both reactive relational aggression and proactive overt aggression was conducted (Table 14). Gender, RPAQ reactive relational aggression and RPAQ proactive overt aggression were entered in step 1

and accounted for a significant portion of the variance (45.1%) in RPAQ proactive relational aggression, $F(3, 86) = 23.51, p < .001$. Reactive relational aggression and proactive overt aggression were both significant predictors. Empathy, emotion regulation, and Machiavellianism entered as a group in step 2 did not explain significant additional variance in proactive relational aggression. Machiavellianism was no longer significant as a univariate predictor; empathy, however, continued to approach significance as a predictor, $t(83) = -1.91, p < .10$.

Empathy, Machiavellianism, and emotion regulation as predictors of overt aggression variables

In order to compare how different factors might be related to relational versus overt aggression, a series of hierarchical regression analyses were performed to investigate the ability of empathy, emotion regulation, and Machiavellianism to predict overt aggression measures, after controlling for the effects of gender and relational aggression (Hypothesis 4). Table 22 summarizes the findings of these hierarchical regressions for overt aggression.

First, a standard multiple regression analysis using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores as independent variables to predict the dependent variable of CSBS total overt aggression was performed (Table 15). The regression model was significant, accounting for 18.5% of the variance in CSBS total overt aggression. Both empathy, $t(86) = -2.40, p < .05$, and Machiavellianism, $t(86) = 2.35, p < .05$, contributed significantly to this model. A hierarchical regression analysis was then carried out using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores to predict CSBS total overt aggression scores (Table 16).

Table 15

Standard Multiple Regression Analysis Predicting Total Overt Aggression From Empathy, Emotion Regulation and Machiavellianism

Measures	<i>B</i>	<i>SE B</i>	β	<i>F</i> (3, 86)	<i>R</i> ²
Empathy	-.01	.00	-.25*		
ER	.00	.01	.04		
Mach	.01	.01	.26*	6.49**	.19**

Note. ER = Emotion Regulation. Mach = Machiavellianism.

p* < .05. *p* < .01. ****p* < .001.

Table 16

Hierarchical Multiple Regression Analysis Predicting Total Overt Aggression, Controlling for Gender and Total Relational Aggression

Measures	β	<i>SE B</i>	<i>R</i> ²	<i>F</i>	ΔR^2	ΔF	<i>t</i>
Step 1							
Gender	.15	.09					
Total Relational	.51***	.09	.28***	16.88***	.28***	16.88***	5.62***
Step 2							
Gender	.05	.09					
Total Relational	.45***	.09					4.93***
Empathy	-.25*	.00					-2.52*
ER	.04	.01					
Mach	.11	.01	.37*	8.30***	.09*	3.91*	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

p* < .05. *p* < .01. ****p* < .001.

In light of the significant effect of gender for empathy as an independent variable, gender and relational aggression scores were entered as control variables in step 1, accounting for a significant portion (28%) of the variance in CSBS total overt aggression, $F(2, 87) = 16.88, p < .001$. Consistent with previous analyses, children who reported engaging in more CSBS total relational aggression also engaged in more CSBS total overt aggression, $t(87) = 5.62, p < .001$. Contrary to results for CSBS total relational aggression scores, however, the combination of empathy, emotion regulation, and Machiavellianism when entered in step 2 explained a significant amount of additional variance (8.8%) in CSBS total overt aggression. Empathy was a significant univariate predictor, $t(84) = -2.52, p < .05$.

Next, a second standard multiple regression analysis was run using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores as independent variables to predict the dependent variable of RPAQ reactive overt aggression (Table 17). The regression model was significant, accounting for 34.4% of the variance in RPAQ reactive overt aggression. Machiavellianism as an independent variable contributed significantly to this model, $t(86) = 3.94, p < .05$.

Table 17

Standard Multiple Regression Analysis Predicting Reactive Overt Aggression From Empathy, Emotion Regulation and Machiavellianism

Measures	<i>B</i>	<i>SE B</i>	β	<i>F</i> (3, 86)	<i>R</i> ²
Empathy	-.02	.01	-.33		
ER	-.01	.01	-.07		
Mach	.04	.01	.38***	15.02***	.34***

Note. ER = Emotion Regulation. Mach = Machiavellianism.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 18

Hierarchical Multiple Regression Analysis Predicting Reactive Overt Aggression, Controlling for Gender and Cross-Subtype Aggressions

Measures	β	SE B	R^2	F	ΔR^2	ΔF	t
Step 1							
Gender	.30***	.15					3.47***
Reactive Relational	.43**	.11					4.65**
Proactive Overt	-.23***	.46	.40***	19.13***	.40***	19.13***	-2.74**
Step 2							
Gender	.15	.15					
Reactive Relational	.37***	.11					4.19***
Proactive Overt	-.15	.42					
Empathy	-.26**	.01					-2.98**
ER	-.06	.02					
Mach	.23**	.01	.53***	15.38***	.13***	7.37***	2.55**

Note. ER = Emotion Regulation. Mach = Machiavellianism.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 18 summarizes the results of hierarchical regression analyses predicting RPAQ reactive overt aggression scores. Taking into account the significant effect of gender for empathy (as an independent variable) and for RPAQ reactive overt aggression, gender as well as RPAQ reactive relational aggression and RPAQ proactive overt aggression were entered as a group in step 1 of the analyses. Step 1 accounted for a significant portion of the variance (40%) in RPAQ reactive overt aggression, $F(3, 86) = 19.13, p < .001$, where all three variables emerged as significant predictors. The addition of empathy, emotion

regulation, and Machiavellianism scores in step 2 contributed an additional 12.6% of explained variance, $F(6, 83) = 15.38, p < .001$. Gender, proactive overt aggression and emotion regulation did not make a unique significant contribution in the full model. Empathy was the strongest independent predictor of RPAQ reactive overt aggression, $t(83) = -2.98, p < .01$, followed by Machiavellianism, $t(83) = 2.55, p < .05$.

Finally, Table 19 presents the results of a standard multiple regression analysis using empathy, Machiavellianism, and emotion regulation (lability/negativity) scores as independent variables to predict the dependent variable of RPAQ proactive overt aggression. The model was significant, accounting for 9.8% of the variance in the dependent variable. Machiavellianism approached significance as a univariate predictor ($p < .10$).

Table 19

Standard Multiple Regression Analysis Predicting Proactive Overt Aggression From Empathy, Emotion Regulation and Machiavellianism

Measures	<i>B</i>	<i>SE B</i>	β	<i>F</i> (3, 86)	<i>R</i> ²
Empathy	.00	.00	.16		
ER	.00	.00	-.02		
Mach	-.01	.00	-.21 ^a	3.11 [*]	.10 [*]

Note. ER = Emotion Regulation. Mach = Machiavellianism.

^aFindings approached significance, $p < .10$.

^{*} $p < .05$. ^{**} $p < .01$. ^{***} $p < .001$.

The results of a hierarchical regression analysis with RPAQ proactive relational aggression, RPAQ reactive overt aggression, and gender entered as control variables in step 1 are presented in Table 20. These variables accounted for a significant portion of the variance (35.4%) in RPAQ proactive overt aggression, $F(3, 86) = 15.68, p < .001$. Gender was the only non-significant univariate predictor in this step. Empathy, emotion regulation,

and Machiavellianism entered together as a block in step 2 did not explain significant additional variance in proactive overt aggression. Examination of beta coefficients revealed that none of these variables emerged as a significant univariate predictor.

Table 20

Hierarchical Multiple Regression Analysis Predicting Proactive Overt Aggression, Controlling for Gender and Cross-Subtype Aggressions

Measures	β	<i>SE B</i>	R^2	<i>F</i>	ΔR^2	ΔF	<i>t</i>
Step 1							
Gender	-.04	.03					
Proactive Relational	.43 ^{***}	.08					4.65 ^{***}
Reactive Overt	-.31 ^{**}	.02	.35 ^{***}	15.68 ^{***}	.35 ^{***}	15.68 ^{***}	-3.26 ^{**}
Step 2							
Gender	-.01	.04					
Proactive Relational	.45 ^{***}	.09					4.70 ^{***}
Reactive Overt	-.26 ^{**}	.02					-2.32 ^{**}
Empathy	.14	.00					
ER	.02	.00					
Mach	.03	.00	.37	8.01 ^{***}	.01	.58	

Note. ER = Emotion Regulation. Mach = Machiavellianism.

^aFindings approached significance, $p < .10$

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 21

Summary of Hierarchical Regression Analyses for Variables Predicting Total Relational Aggression, Reactive Relational Aggression and Proactive Relational Aggression

Note. ER = Emotion Regulation. Mach = Machiavellianism.

^aFindings approached significance, $p < .10$

*** $p < .001$.

Variables	Total Relational Aggression β		Reactive Relational Aggression β		Proactive Relational Aggression β	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Gender	-.11	-.08	-.13	-.10	.12	.05
Overt Aggression (Opposite Function)	.52***	.50***	.42***	.43***	.32***	.34***
Relational Aggression (Opposite Function)	-	-	-.48***	-.46***	-.46***	-.43***
Empathy		.14		.07		-.18 ^a
ER		-.01		.03		-.08
Mach		.19 ^a		.03		-.10
ΔR^2	.27***	.03	.51***	.00	.45***	.03
ΔF	15.87***	1.35	29.45***	.20	23.51***	1.58

Table 22

Summary of Hierarchical Regression Analyses for Variables Predicting Total Overt Aggression, Reactive Overt Aggression and Proactive Overt Aggression

Note. ER = Emotion Regulation. Mach = Machiavellianism.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Variables	Total Overt Aggression β		Reactive Overt Aggression β		Proactive Overt Aggression β	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Gender	.15	.05	.30***	.15	-.04	-.01
Relational Aggression (Opposite Function)	.51***	.45***	.43***	.37***	.43***	.45***
Overt Aggression (Opposite Function)			-.23***	-.15	-.31**	-.26**
Empathy		-.25*		-.26**		.14
ER		.04		-.06		.02
Mach		.11		.23**		.03
ΔR^2	.28***	.09*	.40***	.13***	.35***	.01
ΔF	16.88***	3.91*	19.13***	7.37***	15.68***	.58

Planned Conditional Process Modeling

Beyond understanding the associations that empathy, emotion regulation, and Machiavellianism have with relational aggression and its reactive and proactive functions, the present study aimed via conditional process modeling to predict and explore the pathways by which these variables act on the dependent variables. Hypotheses 5 and 6 specified predictions based on mediation and moderated mediation models. Mediation models are the basis of many theories in psychology, where questions of “how” are addressed by establishing the degree to which an independent variable (X) influences an

outcome (Y) through one or more mediator (M) variables (Hayes, 2012). Conversely, moderation examines questions of “when” by determining whether and how a moderating variable (Z) modifies the relationship of the independent variable (X) to the outcome variable (Y) when Z is at different values (i.e., an interaction effect; MacKinnon, Fairchild, & Fritz, 2007).

While Baron and Kenny’s (1986) work on mediation analysis is one of the most widely cited and used, there are more statistically rigorous methods of assessing mediation models (e.g., Sobel, 1982) with superior statistical power and insightful appeal (Mackinnon et al., 2002). In small samples especially, Preacher and Hayes (2004) suggest that coefficients may be non-significant simply because of low power. As such, computer-intensive analysis programs that draw on observed data to produce a reference distribution for use in the estimation of confidence intervals and significance testing (i.e., case resampling methods, such as bootstrapping; Preacher & Hayes, 2004) are increasingly appealing (MacKinnon, Fairchild, & Fritz, 2007). Resampling methods are particularly appropriate for smaller samples in that they offer an approach to estimating and hypothesis testing of effect sizes without needing to meet assumptions about the normality of distributions (Preacher & Hayes, 2004).

The requirement that there be a significant association (path *c*) between X and Y for Baron and Kenny’s (1986) approach severely reduces power for testing mediation effects, as confirmed by simulation studies (MacKinnon et al., 2002, 2004). While there are contrasting views on the topic (Collins, Graham, & Flaherty, 1998; MacKinnon, 2000), analysts have argued that it is possible to find significant indirect effects of mediation in the absence of significant total or direct effects (MacKinnon, Fairchild, & Fritz, 2007). As such, the

mediation analyses of the current study were based on MacKinnon and colleagues' (1993, 2007) model (referred to as Model 4; Hayes, 2012), where mediation is not contingent on a direct significant effect between independent and dependent variables. This model proposes that a mediation effect is demonstrated when: 1) the coefficient between the independent variable and the mediating variable is significant (path *a*); 2) there is a significant coefficient between the mediating variable and the dependent variable (path *b*); and 3) there is a significant product of the two previous coefficients, representing an indirect effect between these two paths (path *ab*) and thus a mediated effect.

Planned mediation analyses for Hypothesis 5 aimed to examine whether emotion dysregulation would mediate the negative relationship between empathy and reactive relational aggression (see Figure 3). Correlational analyses (see Table 3) did not find any significant associations between emotion regulation and empathy, or between emotion regulation and reactive relational aggression. Preliminary analyses demonstrated that Beta coefficients for path *a* (empathy to emotion regulation) and path *b* (emotion regulation to reactive relational aggression) were non-significant (see Figure 5). Significant mediation effects are not necessarily contingent on significant Beta coefficients for path *c'* (i.e., the significant direct effect of X on Y). However, significant mediation effects are contingent on the coefficients for path *a* and path *b* being significant. The variables in the present study did not meet the criteria for mediation analyses, and as such did not provide any support for carrying out these analyses. The non-significant Beta coefficients for path *a* (empathy to emotion regulation) also precluded running similar analyses examining the mediation of reactive overt aggression by emotion regulation, as moderated by empathy. The statistical non-significance of the path *b* coefficient (emotion regulation on proactive relational

aggression) also precluded the planned mediation analyses in Hypothesis 6, which predicted that empathy and emotion regulation would significantly moderate and mediate (respectively) the positive association between Machiavellianism and proactive relational aggression (see Figure 6). Beta coefficients for the effects of emotion regulation on proactive overt aggression were also statistically non-significant. Therefore, the planned mediation and moderation analyses were also not computed for overt aggression outcomes.

Discussion

The primary purpose of this study was to examine to what extent individual differences in Machiavellianism, emotion regulation, and empathy predicted an early adolescent sample's self-reported use of relational aggression as a function of reactive and proactive function subtypes. The study used Crick and Dodge's (1994) Social Information-Processing Theory as a framework for understanding at what stage of processing various emotional and cognitive factors might affect relational aggression.

Machiavellianism, emotion regulation, and empathy together were found to add somewhat to the prediction of self-reported levels of total relational aggression, reactive relational aggression, and proactive relational aggression. However, when reactive, proactive, and overt aggression indices and gender were controlled for, the predictive power of the emotional and cognitive variables generally was reduced. For reactive and proactive relational aggression, controlling for the opposite functional subtype of aggression generally resulted in the reduced predictive power of these correlates. In contrast, when controlling for gender and overt aggression, Machiavellianism approached significance as a predictor of total relational aggression.

When overt aggression and reactive and proactive subtypes of relational aggression were controlled for simultaneously in analyses, the predictive associations of Machiavellianism, emotion regulation, and empathy as a group and as univariate predictors for relational aggression became more apparent. Specifically, when both proactive overt aggression and reactive relational aggression were controlled for, empathy approached significance as a univariate predictor. Overt aggression analyses also further clarified the role that empathy and Machiavellianism play in predicting aggression, namely reactive overt aggression. Contrary to expectations, emotion regulation appeared to have little power for predicting total relational aggression, reactive relational aggression, and proactive relational aggression. Conditional process modeling did not identify any significant mediation or moderation pathways.

Association of Relational Aggression and Overt Aggression

Consistent with expectations and previous research findings (Crick & Grotpeter, 1995; Grotpeter & Crick, 1996), the well established relationship between total relational aggression and total overt aggression measures was replicated in the present study. Relational and overt aggression subscales of the CSBS-SR (Crick & Grotpeter, 1995) were significantly and positively correlated, meaning that children who endorsed engaging in acts of relational aggression also tended to endorse engaging in acts of overt aggression. The mean scores of aggression measures for this sample were comparable to previous studies, and as such likely reflected the relative normality of rates of aggressive behaviour seen in youth in this particular sample (e.g., Crick, 1996; 1997; Crick, Casas, & Nelson, 2002).

In this study, total relational aggression scores were positively associated with both reactive and proactive aggression scores, meaning students who reported higher levels of

total relational aggression also reported higher levels of reactive and proactive relational and overt aggression. It was expected that the CSBS total relational aggression scores and RPAQ reactive and proactive aggression scores would be significantly related, as the latter measure (Little et al., 2003) was developed based on Crick and Grotpeter's (1995) scale and associated concepts. Little and colleagues' (2003) measure of reactive and proactive aggression is more recent and as such has less of a profile in the literature; however, its utility as a measure that unties the form and function of aggression is gaining (e.g., Fite et al., 2011). As noted earlier, Crick's (1997) measure assesses the prevalence and frequency of aggressive behaviours (i.e., the form of aggression alone), whereas Little and colleagues' (2003) measure aims to tap into the subjective explanations that children offer for why they engage in relational aggression. The use of both approaches to assessing aggression is supported by meta-analyses of the reactive-proactive literature. Studies that employ questionnaires that measure the forms and functions of aggression as discrete entities are most successful at supporting the distinctness of the two subtypes (Polman et al., 2007).

Previous work with participants in middle childhood and adolescence has found negative correlations between reactive and proactive functions of aggression (Fite et al., 2008; Little et al., 2003). Moreover, while relational and overt forms on the RPAQ are found to be significantly and moderately correlated, reactive and proactive subtypes are typically correlated to a lesser extent (Little et al., 2003). These findings were not replicated in the present study, despite the fact that mean scores for this sample were comparable to previous findings (e.g., Fite, Stoppelbein, Greening, & Gaertner, 2009). Reactive and proactive functions were significantly and positively associated across overt and relational forms of aggression, and these correlations were of medium to large magnitude. Children endorsed

somewhat more reactive intent than proactive intent for relational aggression. In other words, when children did aggress in a relational way, they reported engaging in less goal-oriented, planned aggression and more reactive, spontaneous aggression.

One possible explanation for the fact that the mean of reactive relational aggression scores was higher than that of proactive relational aggression scores is the association between children's developmental maturity at the ages represented in this sample. The participants in this sample are just entering adolescence ($M_{\text{age}} = 12.84$ years), and as such the social cognitive and executive functioning skills expected to lead to more scheming forms of aggression (Bjorkvist, 1994) may have yet to develop to their full extent. It could also be that these findings point to the idea that children who are more proactively inclined are less likely to divulge the manipulative or devious intents behind their aggression. Scales that account for socially desirable responding (see Crowne & Marlow, 1960; Crandall, Crandall, & Katkovsky, 1965) may have the capacity to shed some light on this possibility. On the other hand, some research has found that social desirability scores have no significant associations with measures of interpersonal behaviour in response to conflict (Murphy and Eisenberg, 2002), and one recent study found that college aged students who scored higher on relational aggression in fact scored themselves lower on measures of socially desirable responding than non-aggressive peers (Scaringi, 2012).

Finally, in keeping with trends in the literature and in an effort to recognize that aggressive behaviour and its correlates occur on a continuum, all of the present study's aggression measures were treated as continuous variables. There are two approaches to controlling for the overt/relational aggression overlap, and findings can differ depending on whether relational aggression is treated as a categorical or continuous variable in analyses

(Godleski & Ostrov, 2010). Similar findings have been demonstrated for reactive and proactive subtypes. For example, Crapanzano, Frick, and Terranova (2010) conducted cluster analyses that revealed two distinct groups of aggressive children, one showing moderate levels of reactive aggression, and one showing high levels of reactive and proactive aggression. They argued that findings showing different correlates for reactive and proactive aggression should be interpreted while considering the fact that children with high levels of proactive aggression also tend to display substantial levels of reactive aggression. This phenomenon may account for the statistically non-significant results of analyses that compare proactive and reactive subtypes. It could be that in this sample, for children who reported engaging in high levels of reactive types of aggression and also tended to engage in high levels of proactive types of aggression, their empathy, emotion regulation, and Machiavellianism scores did not uniquely predict one functional subtype of relational aggression over the other. It is also possible that, had this study taken the categorical approach to analyses - where participants are separated into primarily overt (i.e., 1 SD above the mean on overt aggression only), primarily relational (i.e., 1 SD above the mean on relational aggression only) or high on both forms (i.e., 1 SD above the mean for overt and relational aggression subscales) groups –these findings would have differed.

While the interpretation of categorical analyses is appealing because it is perhaps more intuitive, it has a number of disadvantages. Even in studies with large samples, because of the substantial correlations between aggression subtypes the number of participants classified into distinct aggression groups is small, and thus this approach can only be used effectively with very large samples (Smith, Rose, & Schwartz-Mette, 2009). This being a small sample study, the decision was made early on to use a continuous approach in

analyses, and this strategy was believed to also have served the goals of this study best given the restricted variability of outcomes scores (i.e., few extreme/outlier scores) and therefore the likelihood that there would not be sufficient proportions of children classifiable into high relational/low overt, high overt/low relational, and high relational/high overt groups to provide sufficient power for analyses.

Effects of Gender and Grade on Emotional, Cognitive, and Aggression Variables

Bjorkqvist and colleagues (1992) once asserted that “girls manipulate and boys fight”. Following the pattern of gender differences reported on relational aggression with CSBS measures (Mathieson & Crick, 2010), girls were expected to score higher than boys on total relational aggression. Children in higher grades were also expected to score higher on total relational aggression scores than children in lower grades (i.e., grade 8 scoring higher than grade 7, which would score higher than grade 6). Smith, Rose and Schwartz-Mette (2009) noted that, when overt aggression is controlled for, the overlap between overt and relational aggression is partialled out, and gender effects on relational aggression (especially for girls) are expected to become stronger. Moreover, studies of adolescents are believed to have more consistent findings for significant female gender effects on relational aggression, regardless of whether overt aggression is controlled for (e.g., Prinstein & Cillessen, 2003; Salmivalli & Kaukiainen, 2004). Nevertheless, contrary to previous research (e.g., Crick, 1997; Crothers, Field, & Kolbert, 2005; Talbott, Celinska, Simpson, & Coe, 2002; Little et al., 2003; Herrenkohl et al., 2007; Fite et al., 2008; Fite et al., 2009), gender and grade were not associated with statistically significant differences in relational aggression measures. This was surprising given the theoretical and developmental findings to the contrary noted above. Unlike previous research (e.g., Andreou, 2004), the present study also found no

significant gender differences in the relationship between factors of Machiavellianism and aggression measures. A significant, large gender effect was detected for empathy, in line with previous findings demonstrating that females generally score significantly higher than males on all of the Interpersonal Reactivity Index's (Davis, 1983) subscales.

Overall, findings suggested that in this sample there were no differences between male and female scores across both forms and functions of aggression, save for males scoring higher than females on reactive overt aggression. This lends support to the assertion some authors have made that the literature regarding aggression and gender differences does not yield unequivocal evidence for strong sex differences (Gini, Albiero, Benelli, & Altoe, 2007; Mullin-Rindler, 2003; Young, Boye, & Nelson, 2006). One of the limitations of much previous research on relational aggression was that samples were exclusively female because this subtype was seen as a primarily female form of aggression (Talbot, Celinska, Simpson, & Coe, 2002; Crain, Finch, & Foster, 2005; Crothers, Field, & Kolbert, 2005; Marsee & Frick, 2007; Mikami, Lee, Hinshaw, & Mullin, 2008). Several authors have argued that boys are just as likely to be relationally aggressive as girls, but that the explicit and easily observed nature of overt aggression, combined with gender expectations, overshadows the presence of relational aggression in boys' social conflicts (Smith, Rose, & Schwartz-Mette, 2009; Spieker et al, 2012; Young, Boye, & Nelson, 2006).

Measuring Relational Aggression

Initial standard multiple regression analyses provided support for the hypothesized association between total relational aggression and empathy, emotion regulation, and Machiavellianism as a group, with Machiavellianism as the significant univariate predictor. These associations were expected to remain significant after overt aggression and gender

were controlled for; however, this was not the case. When gender was controlled for in addition to overt aggression in analyses, the three predictor variables' association with total relational aggression was not significant. Machiavellianism, however, approached significance as a univariate predictor.

This latter finding is consistent with others indicating that children who engage in aggressive behaviour, including relational aggression, often hold Machiavellian attitudes (Andreou, 2000, 2004; LaFontana & Cillessen, 2002; Sutton & Keogh, 2000, 2001), and lends some theoretical support to the present study's proposal that relationally aggressive children may draw on Machiavellian attitudes as mental representations that in turn impact various steps in the processing of social information.

Reactive relational aggression. Hypothesis 2 predicted that reactive relational aggression would be significantly predicted by low empathy and high emotion dysregulation, but not by Machiavellianism. Preliminary standard regression analyses did find a significant association between reactive relational aggression and the combination of these correlates, with Machiavellianism as the strongest predictor. It was expected that these associations would remain significant after proactive relational aggression and overt aggression were controlled for. However, this was not the case. These results therefore appear to contradict previous findings that reactive aggressors exhibit significantly lower empathy than their proactively aggressive counterparts and non-aggressive peers (e.g., Mayberry & Espelage, 2007).

Proactive relational aggression. The third hypothesis of the present study predicted that proactive relational aggression would be significantly associated with high empathy, low emotion dysregulation, and high Machiavellianism. Standard regression

analyses found the combination of these three variables to be statistically significant, with Machiavellianism again emerging as the strongest independent predictor. These associations were expected to remain significant after reactive relational aggression and gender were controlled for; however, this was not the case. When the analysis was conducted controlling for proactive overt aggression and gender, the step involving Machiavellianism, empathy, and emotion regulation did contribute an additional amount of variance in proactive relational aggression that approached significance. Machiavellianism was a significant univariate predictor, and empathy approached significance as a univariate predictor. In other words, proactive relational aggression showed a trend towards being predicted by this combination of emotional and cognitive variables, and was specifically associated with higher levels of Machiavellianism, with a non-significant trend for higher levels of empathy to predict at the univariate level as well. When both reactive relational aggression and proactive overt aggression were simultaneously controlled for, the emotional and cognitive variables as a group no longer contributed additional variance in proactive relational aggression. Machiavellianism no longer reached significance as a univariate predictor. However, the non-significant trend for higher levels of empathy remained.

While non-significant, the trend for higher empathy to predict proactive relational aggression was hypothesized yet contrary to some previous findings, in that proactive aggression is typically linked to callous-unemotional traits and antisocial personality indices (Marsee & Frick, 2007; Ostrov & Houston, 2008), which could be considered the antithesis of empathy. However, it should be noted that Marsee and Frick's (2007) sample consisted of detained females, and probably does not represent a normative or highly generalizable sample of relationally aggressive youth. Proactive aggressors may in fact have superior

empathic perspective-taking skills (Sutton & Keogh, 2000, 2001; Sutton, Smith, & Swettenham, 1999; Mayberry & Espelage, 2007). Empathy may also be especially prone to socially desirable responding, as Lovett and Sheffield (2007) observe that it is seen as a positive trait to have. Children who engage in proactive forms of relational aggression could be adept at presenting themselves in a positive, more empathic light. For instance, in line with previous results (e.g., Batanova and Loukas, 2011), every aggression subtype score in this sample was associated with low affective empathy, low cognitive empathy, or both, with the exception of proactive relational aggression. In addition, there was a negative correlation between the total empathy score and Machiavellianism.

These findings were also partially consistent with the literature indicating Machiavellianism as contributing significantly to the predictive equation of relational aggression and proactive aggression (Kerig & Stellwagern, 2010). Children who are skillfully Machiavellian are believed to balance manipulation and aggression to gain social advantages (Hawley, 2003); in this sample, Machiavellianism was most associated with total relational aggression. Relational aggression is associated with “moral disengagement”, a tendency to behave in ways that are untrustworthy, manipulative, and seemingly lacking in guilt (Pepler, Jiang, Craig, & Connolly, 2008) that mirrors Machiavellianism’s core components. Interestingly, Machiavellianism was correlated with but not predictive of reactive relational aggression. This may be due to the lack of faith and distrust that victimized children who then respond aggressively may develop, as opposed to the goal-oriented manipulation of others for personal gain that is characteristic of more planful, proactive Machiavellians. Indeed, relational aggression and relational victimization are moderately correlated over periods of several months, suggesting that the two roles can

converge for some children (i.e., bully/victims; Yeung & Leadbeater, 2007). Previous research has suggested that bully/victims' high scores on Machiavellianism reflect their negative perceptions of others in the world in response to being bullied (i.e., lack of faith in humanity), and the Machiavellian interpersonal strategies that they have developed to deal with others (Andreou, 2001). It is likely that the present study included children who typically fulfill one of a number of potential roles in a bullying scenario (e.g., ringleader bullies, assistant/follower bullies, reinforcers, defenders, bystanders, and victims; Sutton, Smith & Swettenham, 1999). Future research using bullying and victimization measures in addition to different subtypes of aggression could be successful in shedding light on the relationships among these emotional and cognitive correlates as alternative ways of predicting aggressive behaviours and roles.

Nevertheless, overall, these findings appear to lend some preliminary empirical support to a model arguing that high empathy possibly plays a unique role in the social information processing of proactively relationally aggressive children.

How distinct are overt and relational aggression?

Relational aggression has long been conceptualized as a “female” form of aggression (e.g., Crick et al., 1999), the social and covert partner to the presumably “male” form that physical and overt aggression personified. However, the present study found only one significant effect of gender on measures of aggression: there was a significant positive correlation between being male and having higher reactive overt aggression scores. These findings indicate that boys are just as likely to be relationally aggressive as girls (Smith, Rose, & Schwartz-Mette, 2009; Spieker et al, 2012; Young, Boye, & Nelson, 2006). It appears that, increasingly, the answer as to why one child aggresses in a particular manner

while another does not may have less to do with their biological sex or gender identity, and more to do with the interpersonal beliefs, values, and skills they draw on when constructing, selecting and enacting a behaviourally aggressive response.

Results from analyses on total overt aggression scores, where low empathy predicted higher total overt aggression, contrasted substantially with those for relational aggression, where none of the three final step predictor variables were statistically significant. These findings suggest that low empathy is more strongly and uniquely associated with global overt aggression than with global relational aggression. Analyses predicting reactive overt aggression differed from those predicting reactive relational aggression, where the emotional and cognitive predictor variables as a whole did not explain significant additional variance, nor were any of these individual predictor variables statistically significant in the final model. In contrast, results from analyses on reactive overt aggression results suggest that both lower empathy scores and higher Machiavellianism scores are more strongly predictive of this type of aggression than was the case for reactive relational aggression. This finding was consistent with previous findings that reactive aggressors exhibit lower empathy than their peers (Mayberry & Espelage, 2007).

Higher empathy scores approached significance as a predictor of proactive relational aggression. In contrast, the emotional and cognitive variables did not explain significant additional variance as a group or as individual predictor variables for proactive overt aggression. Taken together, these findings seem to indicate that low empathy and high Machiavellianism together predict total overt aggression and reactive overt aggression, but are not associated with proactive overt aggression. Low empathy scores were consistently and significantly predictive of overt aggression scores and its reactive subtype. This is

partially consistent with correlational analyses finding that both low empathic concern and low perspective taking skills were associated with higher levels of total overt aggression, reactive overt aggression, and proactive overt aggression. Reactive relational aggression was not significantly predicted by empathy, although it was significantly correlated with low perspective taking skills (but not empathic concern). This suggests that reactive relational aggressors may have significantly below average cognitive empathy but closer to average affective empathy (Andreou, 2006; Arsenio & Lemerise, 2001; Sutton & Keogh, 2000; Sutton, Smith, & Swettenham, 1999). Proactive relational aggression scores, on the other hand, were not associated with below or above average scores on either empathy subscale, and there was a trend for proactive relational aggression to be predicted by higher global empathy in regression analyses.

In summary, the comparison of emotional and cognitive predictors of overt and relational aggression in the present study appears to support their distinctiveness and the significance of considering reactive and proactive subtypes in addition to overt and relational subtypes in understanding the potential determinants of aggression.

Empathy and Emotional Regulation in Conditional Process Modelling

This study predicted that low emotion regulation (i.e., high emotional dysregulation) would mediate the path from low empathy to reactive relational aggression. It was anticipated that emotion dysregulation would put a child at increased risk for reactive aggression (e.g., Degnan, Calkins, Keane, & Hill-Soderlund, 2008) if that child was also low in empathy. There was no support for this hypothesis in the present study. Significant coefficients between crucial variable pathways were not found, which precluded carrying out the planned final steps of mediation and moderation analyses.

Measuring Emotion Regulation: Possible Limitations

One of the most surprising outcomes of the present study was the non-significant statistical role that emotion regulation scores appeared to play in the prediction of aggression. Emotion regulation is a concept that experts in the field continue to struggle to define and measure precisely (Eisenberg & Spinrad, 2004; Gross, 1998; Shields & Cicchetti, 1997), and little research examining emotion regulation as a correlate of relational aggression has been reported. The present study hypothesized that emotion dysregulation would predict reactive aggression, as reactively aggressive children have been found to be significantly more emotionally dysregulated than their proactively aggressive peers (Kim & Cicchetti, 2010; Marsee & Frick, 2007; Xu & Zhang, 2008). Additionally, Eisenberg and Fabes (1992) hypothesized that children who use proactive aggression may experience emotion regulation deficiencies that are similar to those of reactive children, but may also experience comparatively lower levels of emotional intensity. However, examination of correlations and regression coefficients indicated that emotion regulation scores had little to no association with any of the predictor or outcome measures in this study, including variables that have been significantly associated with emotion regulation measures in the past, such as overt aggression (e.g., Degnan, Calkins, Keane, & Hill-Soderlund, 2008; Eisenberg, Fabes, Guthrie & Reiser, 2000) and empathy (e.g., Arsenio & Lemerise, 2001).

Emotion regulation was assessed using the Lability/Negativity subscale of the Emotion Regulation Checklist (ERC; Shields and Cicchetti, 1997), which was completed by adult caregivers familiar with participating children. The low return rate of parent measures may have negatively affected the predictive power of emotion regulation scores, and it may also have been the case that only parents whose children were low on emotion dysregulation

allowed their children to participate in the research and completed this measure for their child. Reported internal consistency for the Lability/Negativity scale of the ERC is typically strong (Cronbach's alpha coefficient of $r = .96$; Shields and Cicchetti, 1997). Reliability analyses for the ERC in this sample revealed a significantly lower coefficient ($r = .69$). The low completion rate of this measure could also have potentially resulted from the ERC's reading level being at a fairly high level. Specifically, the Flesch-Kincaid Grade Level Reading Level of the ERC is 10.8, well above the reading levels of the other measures used in this study.

Limitations of the Present Study

The present study was a single-stage, cross-sectional design. As such, one cannot draw inferences about causal relationships from these correlational analyses. While the sample size certainly appeared to be adequate to detect even small effect sizes, even in the case of the emotion regulation measure completed by parents, the smaller sample for this latter measure may have had an impact on the power of analyses. The sample size did reduce the viability of categorical approaches to analyses of aggression (e.g., grouping participants by high and low scores on form and function of aggression measures).

The population of the area in which this sample was drawn was a diverse one, with over 57% of persons self-identifying as visible minorities (Statistics Canada, 2006). Racial and ethnic information for this sample's participants could have provided more specific information relevant to the generalizability of the study's findings. However, the present study's goals did not include examining racial and ethnic profiles of reactive and proactive relational aggressors. Evidence bearing on the importance of race and ethnicity for an understanding of aggression is mixed; some studies find that African American students

score higher on aggression measures than other ethnic groups (e.g., Latino, Caucasian, Asian, Multiethnic/Other; Bellmore, Villarreal, & Ho, 2011), while others argue that little evidence exists to support the idea of variation in relationally aggressive behaviour across ethnic groups (e.g., Herrenkohl et al., 2009). Indeed, a recent examination of the structure, associations, and gender differences between physical and relational aggression in nine countries provided more support for cross-country similarities than differences (Lansford et al., 2012).

This study's data depended on its primarily self-report driven survey design. Inferences about correlational and predictive relationships need to be interpreted while keeping in mind the possible impact of common method variance (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Self-report measures may underreport or underestimate aggression, given the negative aspect of these behaviours. For instance, Ledingham and colleagues (1982) found greater inter-rater agreement between peer and teacher assessments of aggression than between self-reports and peer and teacher ratings for first, fourth, and seventh-grade children. These self-other informant discrepancies were greater for children with higher peer-rated aggression and withdrawal scores. In addition, other individual characteristics influence the underestimation of aggression by self reports: Penney and Skilling (2012) reported that higher self-report scores on measures of psychopathic traits, deceitfulness, and arrogance were associated with higher self-other informant discrepancy on measures of aggression and rule-breaking. Self reports were lower than caregiver reports, perhaps reflecting impaired insight or misrepresentation of one's problem behaviours. However, adult ratings may also underestimate children's actual levels of covert forms of aggression like relational aggression, particularly with middle school

students (Werner & Hill, 2010). Reports by other informants are limited by the context in which raters interact with target participants. For instance, teachers can only comment on behaviours they observe in the school setting, whereas parents are typically not included in that setting and report more on behaviours observed at home with other family members (Loukas et al., 2008). Neither parents nor teachers may have the opportunity to observe peer-to-peer interactions on the playground, on the way to and from school, and during social outings and extracurricular activities. Indeed, parents may report lower levels of externalizing behaviour than youth as the adolescents age because those problems may go unnoticed or unreported to parents (Verhulst & van der Ende, 1992; see also van der Ende, Verhulst, & Tiemeier, 2012). Self-reports do allow researchers to capture behaviours and processes that occur out of sight from others, thus typically displaying good validity as they likely capture the full gamut of relationally aggressive behaviours that individuals use (Batanova & Loukas, 2011). Moreover, self-reports are the primary tool for capturing the true, subjective intent of behaviours in children old enough to self-reflect (Little et al., 2003). Nevertheless, ideally further studies would include as many ratings from multiple sources as is feasible in order to facilitate cross-informant comparisons.

The initial intent for the present study was to assess participants' engagement in total relational aggression using the peer nomination form of the Children's Social Behavior Scale (CSBS; Crick & Grotpeter, 1995). In response to feedback from school boards' concerns over the use of peer nomination data collection, the self-report version of the CSBS was used as an acceptable alternative. Reported reliability coefficients of peer versus self-report measures of the CSBS appear to slightly favour the peer nomination version. Cronbach's alpha coefficients range from $r = .82$ to $.89$ for the peer report relational aggression subscale

(Werner & Crick, 2004) versus $r = .73$ for the self-report relational aggression subscale (Crick & Grotpeter, 1995; Crick, 1996). The use of peer measures of relational aggression might have generated quite different findings. However, it is encouraging to see that, despite this change in proposed methodology, the present study's self rating scores had relatively strong psychometric characteristics and demonstrated comparable reliability and mean scores to previous samples.

Finally, findings in the realm of reading research suggest that parental and home literacy is significantly predictive of and associated with children's literacy (e.g., Byrne et al., 2009; Evans, Reynolds, Shaw, & Pursoo, 2011). If parental completion rates in this study were actually affected by reading comprehension features of the emotion regulation measure, it is feasible that the reading level of child self-report measures may have been too advanced for some children as well, particularly in a multicultural school board. This could have impacted the completion of measures for some participants. Data was collected in English-speaking classrooms, but objective measures of reading levels for each child were not collected in this study; therefore, the actual level of literacy for each child is difficult to estimate. There is a small chance that some children refrained from asking for clarification of items in front of classmates so as to not draw attention to themselves. From behaviour observed during administration, however, children openly asked questions for clarification if there were particular words or phrasing they did not understand, drawing the researcher's attention to and allowing her to address potentially unclear items. Students in this study were encouraged to ask questions, and were given clarification by the researcher.

Implications, Interventions and Future Directions

Relational aggressors, in addition to their victims, experience long-term difficulties in

social-psychological adjustment. Aggressors may have difficulty forming close friendships, as well as experiencing difficulty with anger management and impulsive and self-destructive behaviour (e.g., Card, Stucky, Sawalani, & Little, 2008; Herrenkohl, Catalano, Hemphill, & Toumbourou, 2009). Their victims report lower perceived safety in the school environment, higher likelihood of bringing weapons to school (Goldstein, Young, & Boyd, 2008), as well as peer rejection, anxiety, depression, retaliatory aggression, and substance use (e.g., Crick, Casas, & Nelson, 2002; Ostrov & Godleski, 2007; Merrell, Buchanan, & Tran, 2006; Werner, 2012). The psychological impact of this kind of aggressive behaviour has been propelled into the public eye over the past several years, with relational aggression being identified as a significant contributing factor for several fatal incidents, such as school shootings and a recent and disturbing number of bullying-related youth suicides (Juvonen, Graham, & Schuster, 2003; Post, 2012). The knowledge of how cognitive and emotional factors contribute to the use of relational aggression and of what differences exist between children who aggress in different ways could be vital to the planning and implementation of policies and interventions to prevent bullying.

The present study follows current trends in the area of relational aggression research (e.g., Ojanen, Findley, & Fuller, 2012) and ongoing efforts to clarify the emotional and cognitive correlates of this form of aggression. The hope is that the examined deficits and differences in cognitive-emotional variables can be observed and potentially targeted in attempts to reduce aggressive behaviour. The findings reported here provide some support for the importance of interpersonal values and compassionate tendencies in understanding aggressive behaviours, if not for indicators of emotional stability or volatility.

The interpersonal skills that children develop in early childhood social interactions are carried into early adolescence and beyond (Ostrov & Godleski, 2007), and the intrapersonal mechanisms and beliefs that guide their choices of how to engage and resolve conflict appear to evolve early in development as well. Indeed, social goals in conflict interactions are based on both external and internal information, and those internal mechanisms include temperament, emotions, and beliefs and values (Crick & Dodge, 1994). Emotional and cognitive elements continue to impact relational behavioural choices well into adulthood. Especially cold and calculated patterns of relational aggression have been associated with significant features of personality pathology (Tackett & Ostrov, 2010; Werner & Crick, 1999), including relatively rare primary and secondary psychopathic traits (Czar, Dahlen, Bullock, & Nicholson, 2011; Schmeelk, Sylvers, & Lilienfeld, 2008). While psychopathy is certainly not the developmental pathway that most children who aggress in a relational manner will follow, it nevertheless appears that addressing maladaptive beliefs, emotions, and tendencies in aggressors may be important in understanding how aggressors and their victims will develop psychosocial maladjustment.

Not only is it important to help aggressors and victims to find new and more positive adaptive ways of behaving, but it is also important to try to change the peer group and school community behavioural norms that support the use of relationally aggressive strategies (Leff et al., 2003). Effective interventions need to be implemented at both individual and community levels, impacting both micro and macro levels of children's ecological systems (Bronfenbrenner, 1979). New environmental influences such as social media (e.g., Facebook, YouTube, Twitter) need to be targeted as these tools make inter-peer aggression possible. Online social forums provide fertile ground for relational aggression against children who

are already victimized in the school setting, with greater anonymity and fewer opportunities for immediate, face-to-face retaliations against aggressors (Jones, Mitchell, & Finkelhor, 2013; Schneider, O'Donnell, Stueve, & Coulter, 2012).

Findings examining global support for relational aggression at both individual and classroom-level behaviours (Werner & Hill, 2010; Bellmore, Villarreal, and Ho, 2011) illustrate the importance of assessing and addressing normative social beliefs about aggression. Perkins, Craig, and Perkins (2011) reported on methods of using social norms as a way of deterring aggression in schools. They collected data on bullying behaviours, personal experiences of victimization, perceived norms for bullying victimization, and pro-bullying attitudes via an online survey with grade 6 to 8 students. These data were then used in social norm interventions, where each of the 5 participating schools received feedback from their students' surveys about the school's social norms for bullying behaviour, which counteracted beliefs about high student support for bullying. Messages broadcasting this information (e.g., "90% of us have not called others hurtful names") were posted around the school on large posters. Analyses indicated that these interventions were effective in reducing students' misperception of peer support for bullying in each school. Students also reported reduced personal bullying and victimization experiences, and were more supportive of reporting bullying to parents and school staff (Perkins, Craig, & Perkins, 2011).

Programming that is aimed at decreasing relational aggression likely needs to take social, cultural, developmental, and gender factors into account if they are to be increasingly effective (Leff, Waasdorp, & Crick, 2010). While current intervention approaches show some promising results, ongoing investigation is needed to improve their effectiveness if they are to meet standards for efficacy (e.g., Society for Prevention Research, 2006; see Leff,

Waasdorp, and Crick, 2010; Merrell, Buchanan, & Tran, 2006; Young, & Boye, & Nelson, 2006 for reviews). Further research expanding on the procedures and measures of the current study might include an emotion regulation measure that more clearly distinguishes the construct from associated concepts such as empathy and self-regulation (Gross, 1998). Including a self-report or physiological indicator of emotion regulation (e.g., Hessler & Katz, 2007; Zeman, Shipman, & Penza-Clyve, 2001) might increase the predictive power of the measure of this construct. Studies should continue to address the importance of potential social information processing deficits other than hostile attribution biases (Crain et al., 2005; Yeung & Leadbeater, 2007). There is an increasingly rich body of literature demonstrating that numerous factors affect the social information processing of aggressors (e.g., Huesmann, 1998; Mayberry & Espelage, 2007; Werner & Hill, 2010).

Research on the adjustment of victimized and aggressing students may also wish to examine whether delayed language skills are associated with levels of reactive and physical aggression, as this could be an additional factor that places already vulnerable students at increased risk of both victimization and retaliatory aggression.

Despite the limitations of the present study, it provides the first conceptually guided examination of diverse emotional and cognitive correlates of reactive and proactive relational aggression in an ethnically diverse sample of Canadian boys and girls. This study was unique in its use of the Social Information-Processing theory (Crick & Dodge, 1994) as a theoretical framework for comprehending how individual differences in Machiavellianism, empathy, and emotion regulation might affect the social information processing sequences of relationally aggressive children. Results provided some initial support for the role of Machiavellianism and above average empathy in relational aggression and instances that

were proactive or goal-oriented. Children high on total relational aggression in this study were shown to hold different attitudes about what is appropriate social behaviour, at least partially indicating their willingness to achieve their personal goals at the expense of others. Therefore, the most effective interventions might involve increasing negative social consequences for bullying in the school environment while addressing these distorted interpersonal schemas. The more that psychologists understand how and why children aggress against each other, the more likely they will be to create effective interventions at both individual and school system levels. All this is done with the hopes that schools can become a more positive, safe, and reinforcing social environment for all students, now and into the future.

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Appendix A – Letter of Participation to Teachers

Dear Educator,

Your principal recently consented to have a research project, entitled “Predicting reactive and proactive relational aggression as a function of Machiavellianism, empathy, and emotion regulation” conducted in your school. The Research Committee of the Dufferin-Peel Catholic District School Board has given permission for this study to be carried out. This study has also received ethics approval from the University of Ottawa’s Social Science and Humanities Research Ethics Board.

As a teacher of students in the grades being investigated for this study, you are being asked to distribute and collect permission forms for students to participate. Please find enclosed in this package twelve (12) envelopes, each containing:

- Letter of information to parents/guardians regarding the research project
- Parent/Guardian Consent Form
- Emotion Regulation Checklist (for parents to complete)
- Self-addressed, stamped envelope

Please distribute these envelopes to your students. Their parents are instructed in the letter to return the included permission/consent form to you. Some may also choose to return the completed Checklist with the permission form instead of mailing it. Please collect the permission forms (and any returned questionnaires) and store them in this envelope.

I will collect these materials from you and will be administering four self-report questionnaires to students whose parents have returned the consent forms to you (and to students who themselves agree to participate). This will take approximately 45-60 minutes on MM-DD-YYYY. I greatly appreciate you taking the time to hand out and collect these materials, and for your cooperation with this research project. I look forward to meeting you and your students soon.

Tiffany A. Pursoo, BA (Hons).
PhD Candidate, Clinical Psychology
University of Ottawa

Appendix B – Letter of Participation and Consent Form for Parents

Dear Parent(s)/Guardian(s),

I am a graduate student at the University of Ottawa and my advisor Dr. Jane Ledingham and I are conducting a research project for my Ph.D. thesis to look at children's emotions, behaviours, and attitudes and how they affect their social relationships with other children. Our hope is that information obtained from this study will help schools to develop procedures in the future to improve relationships among students so that school will be a more positive environment for everyone. All of the students in your child's classroom are being asked to participate. Based on similar studies we have done in the past, we believe that your son or daughter will find this experience of interest and may learn something new about his or her social relationships.

Should you and your child agree to participate, a brief questionnaire about your child's emotions and behaviours has been included for you to complete. Your child will be asked to complete four short questionnaires about his/her own attitudes towards and ways of reacting to classmates. These will include questions about how often your child feels he/she engages in helpful and hurtful behaviours; whether, when a peer is hurtful towards him/her, your child plans his/her reaction against others or reacts more instinctively when others hurt him/her; if your child mostly tries to be honest or tries to fool others on occasion; and if your child feels he/she can mostly see things from another person's perspective or if he/she finds it hard to know what others are feeling sometimes. While participating students are completing these measures, a teacher will be present in the classroom. The primary researcher will be monitoring the classroom to discourage sharing of information and emphasize the importance of confidentiality in completing questionnaires.

Only children with written permission from their parents and who themselves indicate they agree to participate will be included in the study. Your son or daughter's participation is completely voluntary. Any child who does not want to participate or who changes his/her mind about participating may stop at any time. Students who do not participate in this research will be given a study/reading period while the other students complete the questionnaires. The questionnaires will be administered to participating students during the week of MM-DD to MM-DD-YY and will take one session of approximately 45-60 minutes. Whether a child participates or not will in no way affect his/her grades or the services he/she receives at school.

All information collected will be strictly confidential and the students will not be identified individually. Data collected will be stored in a secure laboratory at the University of Ottawa, and all digital files will be password protected and stored on secure computers in said laboratory. The data will only be accessible to me, my research supervisor, and a research

assistant. All data will be conserved for 10 years, and after this time it will be properly disposed of via shredding and secure deletion.

The Research Committee of the Dufferin-Peel Catholic District School Board has given permission for this study to be carried out at your child's school. This study has received ethics approval from the University of Ottawa's Social Science and Humanities Research Ethics Board.

You and your son or daughter's participation in this project would be immensely appreciated. Should you have any questions or concerns regarding this research project, please do not hesitate to contact me (Tiffany Pursoo) at the University of Ottawa, at xxx-xxx-xxxx, ext. xxxx (e-mail: xxxx). You may also contact my faculty research supervisor Dr. Jane Ledingham at xxx-xxx-xxxx, ext. xxxx (email: xxxx). If you have any questions regarding the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 159, Ottawa, ON K1N 6N5 (Tel.: xxx-xxx-xxxx, email: xxxx). Your child's school will be provided summaries of the findings of the study upon completion. We will also send out a description of our results and their implications to interested parents.

If you and your child wish to participate, please complete the attached permission form and the enclosed questionnaire and return them to your child's teacher by MM-DD-YYYY. Thank you in advance for your co-operation.

Tiffany A. Pursoo, BA (Hons).
PhD Candidate, Clinical Psychology
University of Ottawa

Jane Ledingham, Ph.D., C.Psych.
Professor and Faculty Research Supervisor
School of Psychology, University of Ottawa

PARENT/GUARDIAN CONSENT FORM:

Please complete the following permission section of this letter and have your son or daughter return it to his/her classroom teacher.

I have read and understood the request for my child to participate in the study examining children's emotions, behaviours, attitudes and social relationships with peers. I hereby give permission for my son/daughter to participate in the research project being conducted by Tiffany Pursoo (University of Ottawa) in the Dufferin-Peel Catholic District School Board.

Name of Child:

Age of Child

Years:

Months:

Signature of Parent/Guardian

Date

Phone number: _____

****Please remember to complete the enclosed questionnaire, seal it in the included envelope (to ensure confidentiality of your questionnaire responses), and return it with the above permission section.**

Appendix C – Letter of Participation and Assent Form for Students

Dear Student,

My name is Tiffany Pursoo and I am a student at the University of Ottawa. I am conducting a project to learn more about how your emotions, behaviours, and beliefs about others affect how you behave towards them. To do this, I need to ask you some questions. If you would like to be part of this project and if your parents give permission for you to participate, then I will ask you to complete four short questionnaires about your feelings and how you behave sometimes. Your participation will involve one 45-60 minute period where you will complete the questionnaires. Your teacher will be in the classroom while these questionnaires are being completed.

I think that you will find taking part in this project interesting, but you do not have to be in it. We hope that this will help you to learn more about how you and your classmates get along. If you do not want to participate, or if you change your mind about participating at any time, you can tell me that you want to stop, and you can stop right away. Students who do not want to participate in this project or whose parents do not want them to participate will be given a study/reading period while the other students complete the questionnaires.

I will keep all of your questionnaire answers completely confidential and your answers will not be identified by your name. Information collected will be stored in a secure laboratory at the University of Ottawa, and all computer files will be password protected and stored on secure computers in that laboratory. The information collected will only be accessible to me, my research supervisor, and a research assistant. All information is kept for 10 years, and after that it is shredded and deleted.

When the research project is completed, I will talk more about this study with your class and answer any questions you may have. I will also make available summaries of what we found for interested students and their families.

If you would like to be part of this project, please sign your name below. If you have any questions, please feel free to contact me. Thank you!

Tiffany A. Pursoo, BA (Hons).
PhD Candidate, Clinical Psychology
University of Ottawa

YES, I would like to participate in this research project:

Name: _____ Grade: _____

Signature: _____ Date: _____

Appendix D - Children's Social Behavior Scale – Self-Report (CSBS-S; Crick & Grotpeter, 1995)

ITEMS:

1. Some kids tell lies about a classmate so that the other kids won't like the classmate anymore. How often do you do this? (RA)
2. Some kids try to keep certain people from being in their group when it is time to play or do an activity. How often do you do this? (RA)
3. Some kids try to cheer up other kids who feel upset or sad. How often do you do this? (PB)
4. When they are mad at someone, some kids get back at the person by not letting the person be in their group anymore. How often do you do this? (RA)
5. Some kids hit other kids at school. How often do you do this? (OA)
6. Some kids let others know that they care about them. How often do you do this? (PB)
7. Some kids help out other kids when they need it. How often do you do this? (PB)
8. Some kids yell at others and call them mean names. How often do you do this? (OA)
9. Some kids push and shove other kids at school. How often do you do this? (OA)
10. Some kids tell their friends that they will stop liking them unless the friends do what they say. How often do you tell friends this? (RA)
11. Some kids have a lot of friends in their class. How often do you have a lot of friends in your class? (INC)
12. Some kids try to keep others from liking a classmate by saying mean things about the classmate. How often do you do this? (RA)
13. Some kids wish that they had more friends at school. How often do you feel this way? (LON)
14. Some kids say or do nice things for other kids. How often do you do this? (PB)
15. Some kids have a lot of classmates who like to play with them. How often do the kids in your class like to play with you? (INC)

NOTE:

- * Relational aggression (RA) items
- Physical/overt aggression (OA) items
- Prosocial behaviour (PB) items
- Inclusion (INC) items
- Loneliness (LON) item

Appendix E – Reactive and Proactive Aggression Measure (Little, Jones, Heinrich, & Hawley, 2003)

ITEMS:

Reactive-overt aggression:

1. When I'm hurt by someone, I often fight back.
2. When I'm threatened by someone, I often threaten back.
3. When I'm hurt by others, I often get back at them by saying mean things to them.
4. If others make me upset or hurt me, I often put them down.
5. If others have angered me, I often hit, kick, or punch them.
6. If others make me mad or upset, I often hurt them.

Instrumental-overt aggression:

7. I often start fights to get what I want.
8. I often threaten others to get what I want.
9. I often hit, kick, or punch others to get what I want.
10. To get what I want, I often put others down.
11. To get what I want, I often say mean things to others.
12. To get what I want, I often hurt others.

Reactive-relational aggression:

13. If others upset or hurt me, I often tell my friends to stop liking them.
14. If others have threatened me, I often say mean things about them.
15. If others have hurt me, I often keep them from being in my group of friends.
16. When I am angry at others, I often tell them I won't be their friend anymore.
17. When I am upset with others, I often ignore or stop talking to them.
18. When I am mad at others, I often gossip or spread rumours about them.

Instrumental-relational aggression:

19. I often tell my friends to stop liking someone to get what I want.
20. I often say mean things about others to my friends to get what I want.
21. I often keep others from being in my group of friends to get what I want.
22. To get what I want, I often tell others I won't be their friend anymore.
23. To get what I want, I often ignore or stop talking to others.
24. To get what I want, I often gossip or spread rumours about others.

Appendix F – The Kiddie Mach Scale (Christie & Geis, 1970)

ITEMS:

1. Never tell anyone why you did something unless it will help you.
2. Most people are good and kind.
3. The best way to get along with people is to tell them things that make them happy.
4. You should do something only when you are sure it is right.
5. It is smartest to believe that all people will be mean if they have a chance.
6. You should always be honest, no matter what.
7. Sometimes you have to hurt other people to get what you want.
8. Most people won't work hard unless you make them do it.
9. It is better to be ordinary and honest than famous and dishonest.
10. It's better to tell someone why you want them to help you than to make up a good story to get them to do it.
11. Successful people are mostly honest and good.
12. Anyone who completely trusts anyone else is asking for trouble.
13. A criminal is just like other people except he is stupid enough to get caught.
14. Most people are brave.
15. It is smart to be nice to important people even if you don't really like them.
16. It is possible to be good in every way.
17. Most people cannot be easily fooled.
18. Sometimes you have to cheat a little to get what you want.
19. It is never right to tell a lie.
20. It hurts more to lose money than to lose a friend.

Appendix G - Interpersonal Reactivity Index (IRI; Davis, 1980)

ITEMS:

1. I daydream and fantasize, with some regularity, about things that might happen to me. (FS)
2. I often have tender, concerned feelings for people less fortunate than me. (EC)
3. I sometimes find it difficult to see things from the "other guy's" point of view. (PT)
4. Sometimes I don't feel very sorry for other people when they are having problems. (EC)
5. I really get involved with the feelings of the characters in a novel. (FS)
6. In emergency situations, I feel apprehensive and ill-at-ease. (PD)
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS)
8. I try to look at everybody's side of a disagreement before I make a decision. (PT)
9. When I see someone being taken advantage of, I feel kind of protective towards them. (EC)
10. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)
11. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)
12. Becoming extremely involved in a good book or movie is somewhat rare for me. (FS)
13. When I see someone get hurt, I tend to remain calm. (PD)
14. Other people's misfortunes do not usually disturb me a great deal. (EC)
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT)
16. After seeing a play or movie, I have felt as though I were one of the characters. (FS)
17. Being in a tense emotional situation scares me. (PD)
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC)
19. I am usually pretty effective in dealing with emergencies. (PD)
20. I am often quite touched by things that I see happen. (EC)
21. I believe that there are two sides to every question and try to look at them both. (PT)

22. I would describe myself as a pretty soft-hearted person. (EC)
23. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)
24. I tend to lose control during emergencies. (PD)
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS)
27. When I see someone who badly needs help in an emergency, I go to pieces. (PD)
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)

NOTE:

* PT = Perspective-taking scale

FS = Fantasy scale

EC = Empathic Concern scale

PD = Personal Distress scale

Appendix H - Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997)

ITEMS:

1. Is a cheerful child. (ER)
2. Exhibits wide mood swings (child's emotional state is difficult to anticipate because s/he moves quickly from positive to negative moods). (LN)
3. Responds positively to neutral or friendly overtures by adults. (ER)
4. Transitions well from one activity to another; does not become anxious, angry, distressed or overly excited when moving from one activity to another. (LN)
5. Can recover quickly from episodes of upset or distress (for example, does not pout or remain sullen, anxious, or sad after emotionally distressing events). (LN)
6. Is easily frustrated. (LN)
7. Responds positively to neutral or friendly overtures by peers. (ER)
8. Is prone to angry outbursts/tantrums easily. (LN)
9. Is able to delay gratification. (LN)
10. Takes pleasure in the distress of others (for example, laughs when another person gets hurt or punished; enjoys teasing others). (LN)
11. Can modulate excitement in emotionally arousing situations (for example, does not get carried away in high-energy play situations, or overly excited in inappropriate contexts). (LN)
12. Is whiny or clingy with adults. (LN)
13. Is prone to disruptive outbursts of energy and exuberance. (LN)
14. Responds angrily to limit setting by adults. (LN)
15. Can say when s/he is feeling sad, angry, or mad, fearful, or afraid. (ER)
16. Seems sad or listless. (ER)
17. Is overly exuberant when attempting to engage others in play. (LN)
18. Displays flat affect (expression is vacant and inexpressive; child seems emotionally absent). (ER)

19. Responds negatively to neutral or friendly overtures by peers (for example, may speak in an angry tone of voice or respond fearfully). (LN)
20. Is impulsive. (LN)
21. Is empathic towards others; shows concerns when others are upset or distressed. (ER)
22. Displays exuberance that others find intrusive or disruptive. (LN)
23. Displays appropriate negative emotions (anger, fear, frustration, distress) in response to hostile, aggressive or intrusive acts by peers. (ER)
24. Displays negative emotions when attempting to engage others in play. (LN)

NOTE:

- * LN= Lability/Negativity scale
- ER= Emotion Regulation scale

Appendix I – Debriefing Form

Emotions, Behaviours, and Beliefs in the Prediction of Relational Aggression

Thank you very much for participating in this study. The purpose of this study was to investigate how kids' emotions, behaviours, and beliefs about others affect how they behave with others.

You were asked to complete questionnaires about your own emotions about others and your behaviours in social relationships. Your parent(s) were also asked to complete a questionnaire about your emotions and behaviours. The purpose of these questionnaires was to look at whether or not you see yourself as hurting others (and if so, in what way), how well you understand others' points of view, how well you can control your feelings, and how much you think it's OK to influence others to get what you want. In this study, we were interested in knowing whether kids who behave in more hurtful ways have more or less difficulty understanding others' point of view, are better or worse at controlling their feelings, and are more or less likely to believe that it is OK to influence others for their benefit.

If you have any concerns about your being part of this study or about the information that you provided, please discuss this with us. We will be happy to try and answer any questions you have about this study. How students get along is important to how well they get along in school, and we hope that, with information from studies like the one you participated in, schools can find new ways to improve how students get along and can keep some kids from hurting the feelings of others so that schools can be a more positive place for everyone.

Please remember that all your answers are kept completely private and are not identified by name. If you would like to have your answers withdrawn from the study, we will do so. If you have more questions about your participation in the study, please contact me (at the information below) or my faculty research supervisor, Dr. Jane Ledingham at xxx-xxx-xxxx, extension xxxx (email: xxx). If you have any questions about your rights as part of this study, you may also contact the Protocol Officer for Ethics in Research, University of Ottawa, at xxx-xxx-xxxx (email: xxx).

Thank you again for your participation.

Tiffany A. Pursoo, BA (Hons).
PhD Candidate, Clinical Psychology
University of Ottawa

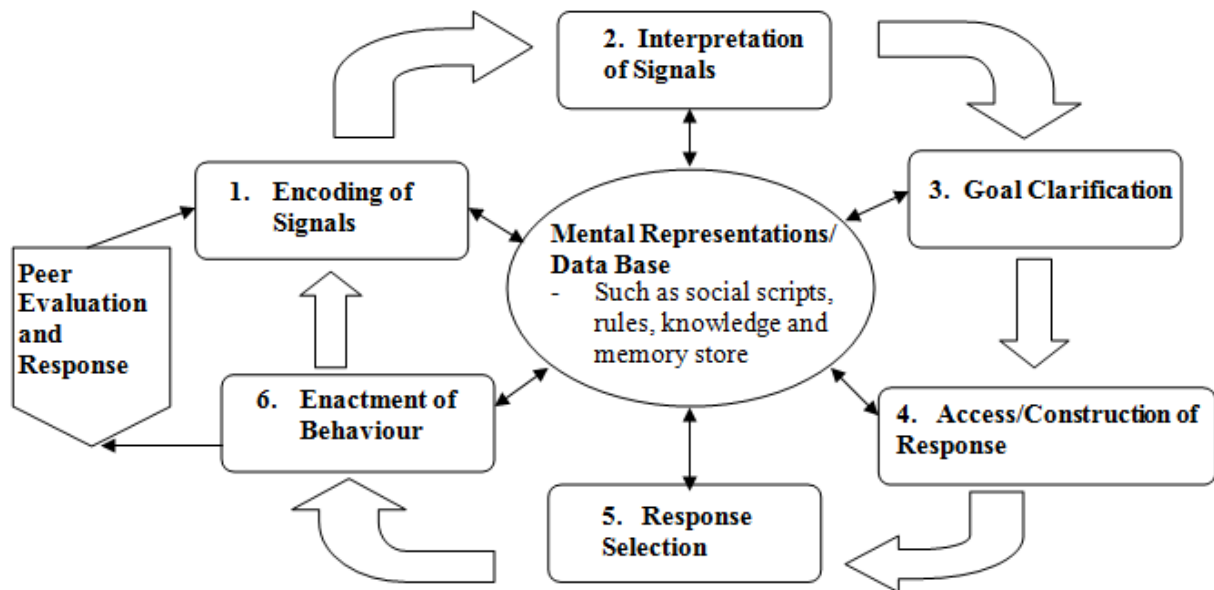


Figure 1. Representation of Crick and Dodge's (1994) reformulated Social Information-Processing model. Adapted from "A review and reformulation of social information-processing mechanisms in children's social adjustment" by N. R. Crick and K. A. Dodge, (1994), *Psychological Bulletin*, 115, p. 74.

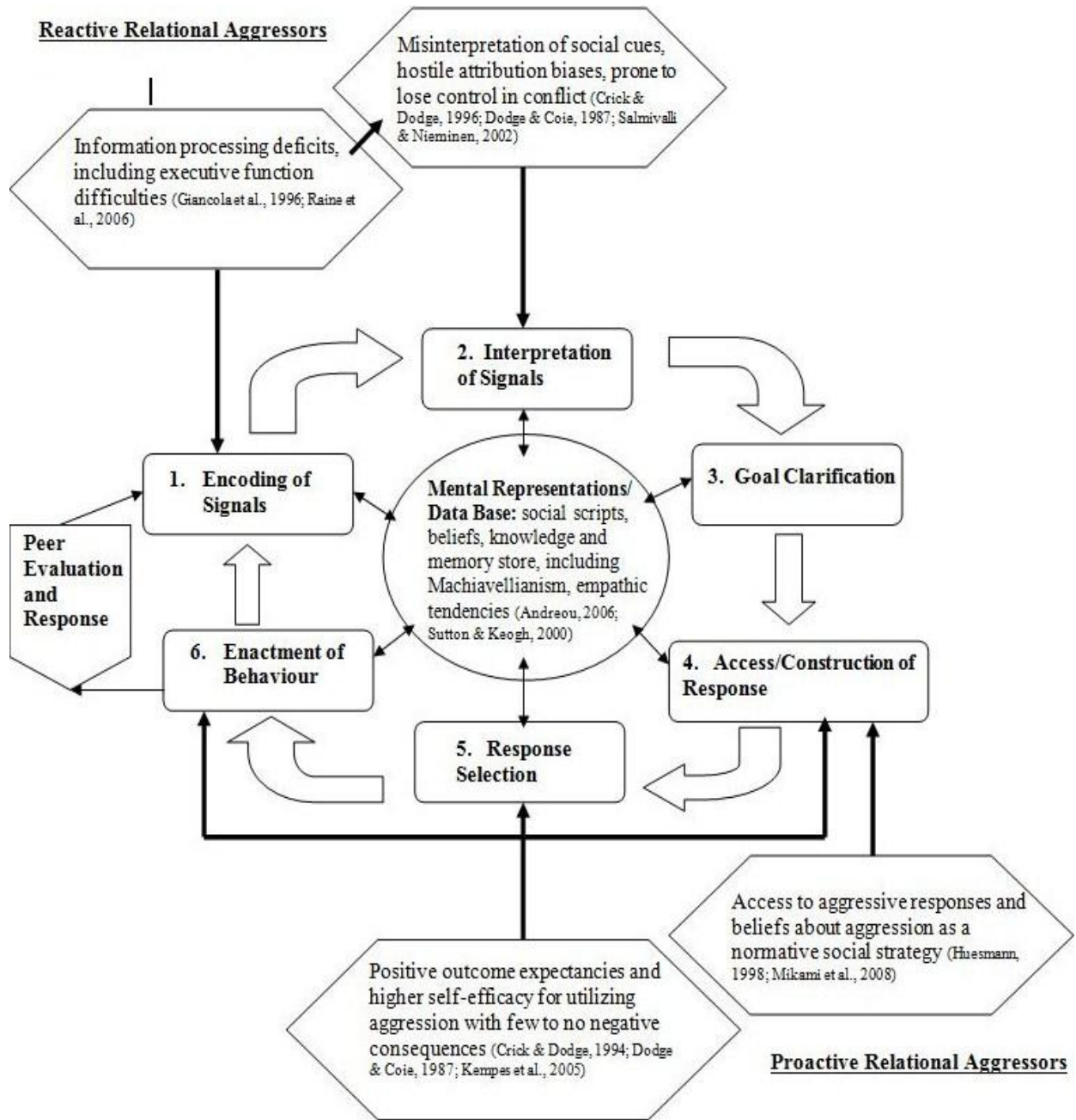


Figure 2. Theoretical elaboration on Crick and Dodge’s (1994) reformulated Social Information-Processing model using findings from relational, reactive and proactive aggression literature. Adapted from “A review and reformulation of social information-processing mechanisms in children’s social adjustment” by N. R. Crick and K. A. Dodge, (1994), *Psychological Bulletin*, 115, p. 74.

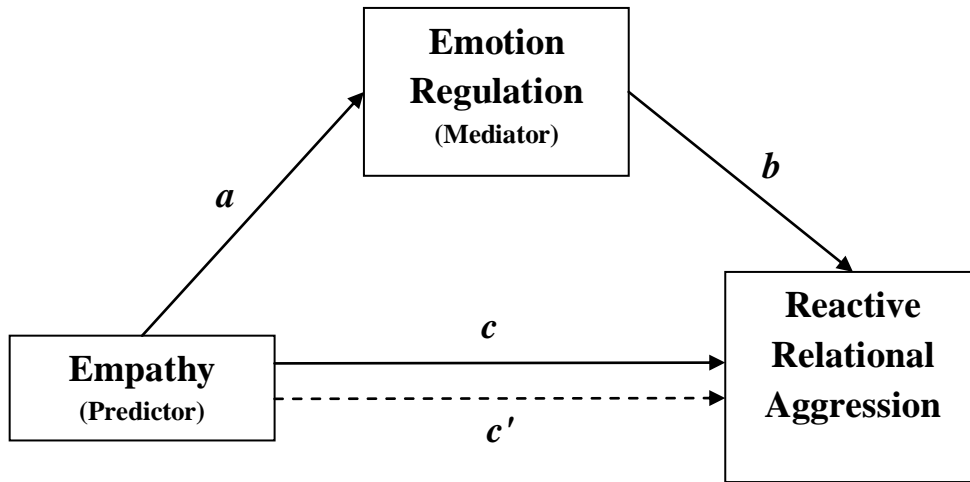


Figure 3. Predicted conceptual mediation model of empathy, emotion dysregulation and reactive relational aggression. Path *a* represents the direct effect of X on M; path *b* represents the direct effect of M on Y; path *c* represents the direct effect of X on Y; and path *c'* represents the product of path *ab*, the total effect of X on Y through M (i.e., the mediation effect). Adapted from “PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling” by A. F. Hayes, (2012), retrieved from <http://www.afhayes.com/public/process2012.pdf>, p. 34.

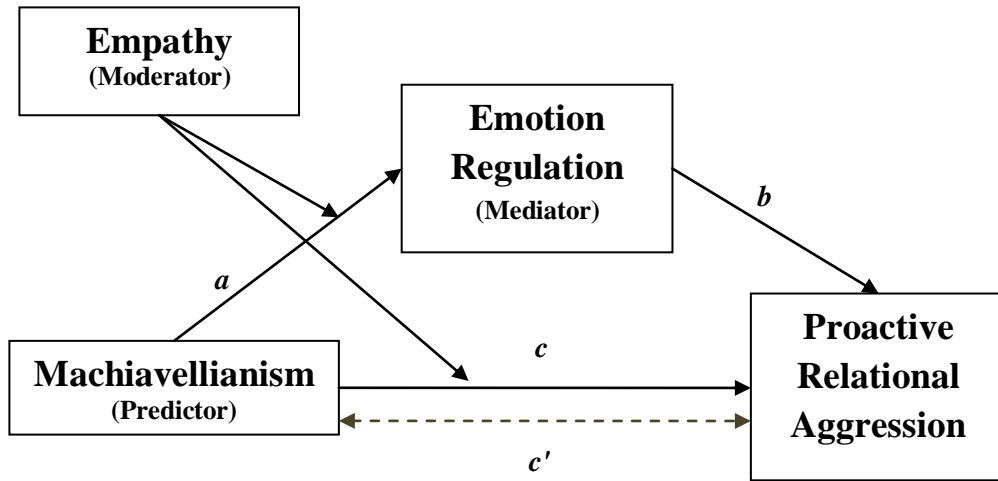


Figure 4. Predicted conceptual moderated mediation model of Machiavellianism, emotion dysregulation, empathy, and proactive relational aggression. As with simple mediation models, path *a* represents the direct effect of X on M; path *b* represents the direct effect of M on Y; path *c* represents the direct effect of X on Y; and path *c'* represents the product of path *ab*, the total effect of X on Y through M (i.e., the mediation effect). Moderated mediation is demonstrated via significant indirect effects of a two-way interaction product between X and W on Y, through M. Adapted from “PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling” by A. F. Hayes, (2012), retrieved from <http://www.afhayes.com/public/process2012.pdf>, p. 35.

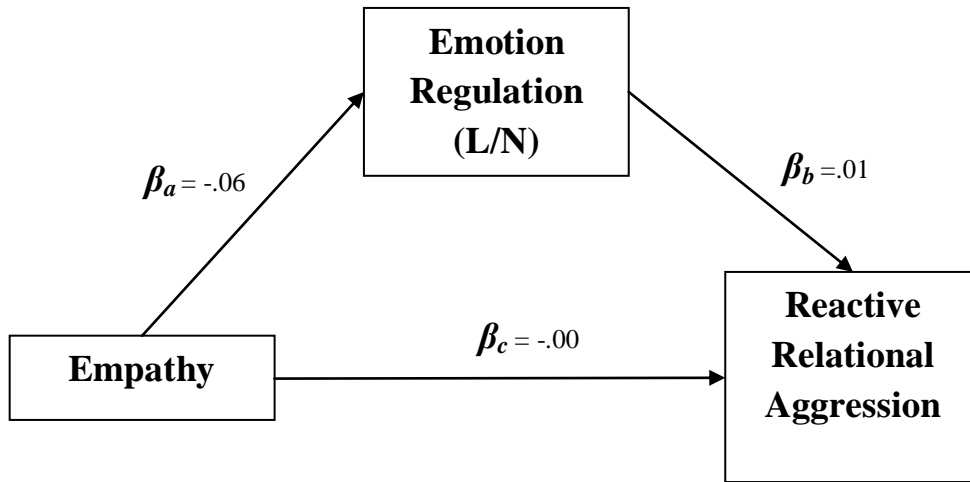


Figure 5. Representation of pathway coefficients ($p = ns$) for predicted mediation model of empathy, emotion dysregulation, and reactive relational aggression.

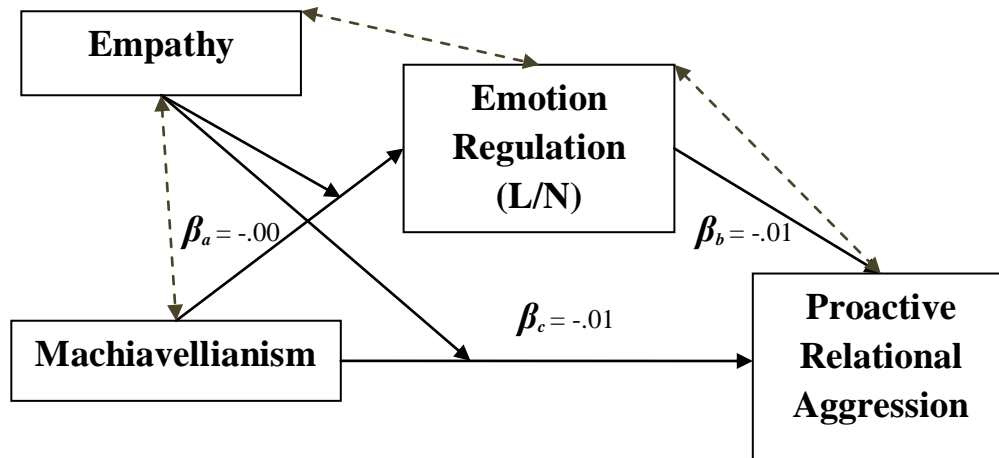


Figure 6. Representation of pathway coefficients ($p = ns$) for predicted moderated mediation model of Machiavellianism, emotion dysregulation, empathy, and proactive relational aggression.