

**Parent and Peer Factors Relating to Adolescent Antisocial Behaviour:
Investigating the Moderating Role of Temperament**

by

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A thesis
submitted in partial fulfillment
of the requirements for the degree
Master of Arts

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BROCK UNIVERSITY
St. Catharines, Ontario

October 2011

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Abstract

The purpose of this study was to examine whether certain temperament characteristics (fearfulness, surgency, frustration, and effortful control) moderate the association between authoritative parenting dimensions (psychological autonomy granting, acceptance-involvement, and monitoring knowledge) or friends' antisocial behaviour, and self-reported antisocial behaviour among adolescents. Questionnaires on adolescent temperament and authoritative parenting were completed by 484 mothers and their adolescent children (54.8% female). In addition, the adolescents responded to measures regarding friends' antisocial behavior and their own antisocial behaviour. Adolescent participants ranged between 13 and 17 years of age ($M = 14.96$ years, $SD = 1.39$) and lived in a region of southern Ontario. As predicted, the results indicated that effortful control moderated the association between parental monitoring knowledge and adolescent antisocial behaviour. Also, as predicted, effortful control moderated the relation between friends' antisocial behaviour and adolescents' self-reports of antisocial behaviour although the relation was sex-specific to girls. Unexpected results included a significant monitoring knowledge by frustration by sex interaction, and a significant friends' antisocial behaviour by age interaction. In general, the findings were consistent with the expectation that the relation of parenting and peer factors to antisocial behaviour would depend on adolescents' temperamental predispositions. However, effortful control, which contributes to individual differences in self-regulation abilities, served this moderating role to a greater extent than the measures of temperamental reactivity, including fearfulness, surgency and frustration-proneness. Implications of these results

are discussed with reference to parenting or classroom-based interventions that may be especially helpful for adolescents with poor self-regulation abilities.

Acknowledgements

My thesis supervisor Drew Dane imparted to me a great richness of knowledge, expertise, ideas regarding organization and structure, and the encouragement and reassurance necessary to first of all begin this project and finally to see it to its completion. I am especially grateful to him for the diligence he showed in maintaining an attitude of positivity, patience, and support throughout every stage of this project.

Second, I am thankful to Teena Willoughby and Angela Book who served on my thesis committee. The insightful remarks and suggestions they provided throughout the planning and editing stages contributed significantly to the overall quality of the end product with which I am well-pleased. Furthermore, their friendliness and cheerfulness in correspondence with me made the entire process a pleasure.

I also want to acknowledge Tina Brook, my faithful labmate. Thanks for going before me and for teaching me everything you've gleaned. I admire your persistence, and your tenacious desire to accomplish your work to its fullest potential.

Lastly, my mother and my husband are both deserving of the warmest thank you possible, as they invested countless hours into this thesis in their own way by lovingly and happily watching over my two sons while I attended school and worked on this project at home. They upheld me in their prayers, with faith, hope, and love, and they encouraged me regularly. Thank you, both, for making it possible for me to pursue this dream of mine and thank you for cheering me on every step of the way.

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Adolescent antisocial behaviour includes a variety of problematic behaviours such as vandalism, theft, and violence (Emler & Reicher, 1995). This particular operationalization is in accordance with the American Psychological Association's definition of antisocial behaviour that states that the construct represents not only sharp deviations from societal norms, but also involves violations of other individuals' rights (VandenBos & APA, 2006). Similarly, Loeber (1985) defined antisocial behaviours in adolescents as those recurring behaviours that inflict harm on others or as those that cause property loss or damage, adding that a subset of antisocial behaviours are illegal and constitute delinquent acts. According to an analysis by Loeber and Schmalting (1985), antisocial behaviour is comprised of an overt-covert dimension with overt antisocial patterns that are confrontational in nature on one end, and covert antisocial patterns that are concealed or hidden on the other end. Violent offences are considered to be overt, whereas non-aggressive acts of vandalism and theft are considered to be covert in nature.

Perhaps not surprisingly, antisocial behaviour is associated with negative outcomes for both perpetrators and victims. For example, the Dunedin Multidisciplinary Health and Development Study, a longitudinally designed study following individuals from ages 3 to 32 in New Zealand, found that antisocial behaviour in adolescence was related to continued violent behaviours (e.g., partner abuse, hitting a child in anger, fighting, and official violence convictions); mental health problems (e.g., anxiety, major depressive, and posttraumatic stress disorders, suicide attempts, internalizing symptoms, and drug dependence); physical health problems (e.g., increased risk for cardiovascular disease, lung function problems, tobacco dependence, etc.); and financial problems (e.g., unemployment, no educational qualifications, no money for food or other necessities, and

homelessness) in adulthood (Odgers et al., 2008). Evidently, antisocial behaviour sometimes has wide-ranging and long-lasting implications for the offenders.

Moreover, antisocial behaviour often has deleterious effects on its victims, who are sometimes adolescents themselves. Perkins (1997) found that adolescents constituted 49% of serious violent crime victims, even though they accounted for only 22% of the population. It has been documented that problems associated with repeated victimization may include a greater risk of developing posttraumatic stress, major depressive and substance use disorders, as well as becoming involved in antisocial or delinquent behaviours (Ford, Elhai, Connor, & Frueh, 2010).

In 2006, the youth crime rate in Canada, which includes individuals between 12 and 17 years of age, was substantially lower than at its peak in 1991 (Taylor-Butts & Bressan, 2006). But while apprehensions of youth for offenses that related to property crimes declined during this time period, the number of apprehensions of youth for committing violent crimes raised considerably (a 12% increase in the past decade, and a 30% increase since the peak in 1991). Elsewhere, other investigators (Curtis, Ronan, Heiblum, Reid, & Harris, 2002) have reported a staggering increase in prevalence rates of antisocial behaviour in New Zealand youth, citing an 80% rise in apprehensions of 14 to 16 year olds in the previous decade with violent offenses increasing by 89% and property damage offenses increasing by 155%. Similar reports exist for juveniles in the United States (Dodge, Coie, & Lynam, 2006). Recently, Odgers et al. (2008) found that, across five biennial assessments at ages 7, 9, 11, 13, and 15, 7.5% of female participants and 8.2% of male participants endorsed participating in approximately four conduct problems from a list that included physical fighting, bullying others, destroying property, telling

lies, truancy, and stealing. Although both boys and girls engage in antisocial behaviour, some researchers have found involvement to be much more common among boys during later adolescence (Van Hulle, Rodgers, D'Onofrio, Waldman, & Lahey, 2007). Hence, it appears that antisocial behaviour is a widely prevalent problem that affects a large number of both children and adolescents. Therefore, due in part to the widespread prevalence of antisocial behaviour, as well as to the serious developmental outcomes to which it relates for all parties involved, this construct represents a crucial area of study, as research that increases our understanding of this behaviour would have implications in clinical settings, as well as in school and family systems.

Numerous models have been proposed and studied in research efforts designed to understand the multifaceted set of factors associated with adolescent antisocial behaviour. Researchers have examined a range of constructs such as child temperament (Frick & Morris, 2004; Frick & White, 2008; Nigg, 2006; Pitzer, Esser, Schmidt, & Laucht, 2009); parenting styles (Steinberg, Darling, & Fletcher, 1995); parenting practices and behaviours (Van Doorn, Branje, & Meeus, 2008), including parental monitoring and knowledge (Keijsers, Frijns, Branje, & Meeus, 2009; Kerr, Stattin, & Trost, 1999; Stattin & Kerr, 2000); the parent-child relationship (Kochanska, 2002; Kochanska, Barry, Stellern, & O'Bleness, 2009), and the child's affiliation with a deviant peer group (Dishion, Spracklen, Andrews, & Patterson, 1996; Monahan, Steinberg, & Cauffman, 2009; Payne & Cornwell, 2007) as predictors of adolescent antisocial behaviour.

The primary purpose of the present study was to explore how temperament might moderate the relation between various parenting and peer factors that have previously been linked with increased adolescent antisocial behaviour – parenting style and friends'

involvement in antisocial behaviour – in order to better understand individual differences in those who engage in antisocial conduct.

Parenting Style

The concept of parenting style emphasizes the twofold importance of control on the one hand, and nurturance and warmth on the other (Baumrind, 1971). Maccoby and Martin (1983) labelled these two parenting dimensions responsiveness (e.g., warmth, support) and demandingness (e.g., structure, control) (Prinzle, Dekovic, Reijntjes, Stams, & Belsky, 2009). Parents who demonstrate high levels of these dimensions would be described as having an authoritative parenting style. Authoritative parenting requires parents to show appropriate sensitivity to their child's needs, to permit developmentally appropriate degrees of psychological autonomy, and to exert adequate levels of behavioural control. Such parenting has been associated with positive adjustment outcomes for the child, including lower levels of behaviour problems and internal distress, and higher levels of psychosocial development and academic competence (Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Gray & Steinberg, 1999).

Gray and Steinberg (1999) employed a measure in their study that captured three main dimensions of authoritative parenting that emerged from factor analyses, including parental acceptance-involvement, psychological autonomy granting, and parental monitoring knowledge, as opposed to using a parenting style typology in which parents are assigned to categories such as authoritative, authoritarian, permissive and neglecting (for further discussion of this measurement issue, see Hoeve, Dubas, Eichelsheim, van der Laan, Smeenk, & Gerris, 2009; and Kuppens, Grietens, Onghena, & Michiels, 2009). These three components of authoritative parenting were the three parent-related

predictors of interest for the current study, as these parenting variables have been implicated as protective factors against antisocial behavioural outcomes in adolescence (Gray & Steinberg, 1999; de Kemp, Scholte, Overbeek, & Engels, 2006; Zhou, Wang, Deng, Eisenberg, Wolchik, & Tein, 2008).

Parental acceptance-involvement. The first authoritative parenting construct, parental acceptance-involvement, or the child's perception of the parent as warm, loving, and responsive, has been shown to be inversely associated with antisocial behaviour. For example, de Kemp et al. (2006) found that higher acceptance-involvement or support in parents was negatively associated with delinquent behaviour 6 months later. Furthermore, Zhou et al. (2008) found a reduction in externalizing behaviours when parents were high in warmth and responsiveness.

Kochanska's (2002) work regarding a mutually responsive orientation in the parent-child relationship may illuminate the reason for the protective benefit of acceptance-involvement in regard to behavioural development. Kochanska (2002) has suggested that a parent-child relationship characterized by parental warmth, nurturance, and shared positive affect fosters the development of conscience in the child, or the internalization of the parent's moral standards. The mutually responsive orientation engenders in the child an eager desire to cooperate with the parent and to comply with his or her values and standards; this is known as committed compliance (Kochanska, 2002). Critically, Kochanska (2002) found that a mutually responsive orientation was particularly important for the conscience development of relatively fearless or thrill-seeking children. According to Kochanska (2002), a positive parent-child relationship promotes a responsive stance in the child toward the parent's influence due to the value

that the child attributes to the relationship. Thus, a relatively fearless child would adopt parental values in order to please the parent, not due to fear of punishment, but because the parents' praise is highly rewarding, as is the positive relationship itself.

Hence, this body of previous research suggests that high levels of acceptance-involvement would enhance a child's ability to self-regulate antisocial behaviour through the internalization of parental values. Consistent with this view, Lengua and Kovacs (2005) reported significant positive correlations between maternal acceptance and self-regulation abilities ($r = .35$) in the child.

Psychological autonomy granting. The second authoritative parenting construct, psychological autonomy granting, represents the degree of liberality with which parents allow emotional autonomy in their children (Gray & Steinberg, 1999), so as to foster a sense of competency and efficaciousness in the child (Barber, Olsen, & Shagle, 1994). Parents may do so by using "non-coercive, democratic discipline" and by facilitating the expression of their adolescent's uniqueness within the family (Gray & Steinberg, 1999). This parenting dimension uses reasoning and explanation with the child when the child's choice is constrained to help heighten sensitivity to consequences (Barber, 1996), and encourages the child, in an autonomy-supportive fashion, to function independently or volitionally in problem-solving situations (Soenens & Vansteenkiste, 2010).

Conversely, psychological control or parental intrusiveness burdens the child's individuation process and hampers their identity formation during adolescence (Barber et al., 1994). Psychological control occurs when parents use manipulation, coercion, and criticism, invalidate feelings, and withhold affection (Morris, Silk, Steinberg, Sessa, Avenevoli, & Essex, 2002) as a means of constraining their child. In a similar vein,

Hoeve et al. (2009) included preventing the child from acting independently, withdrawing love, and inducing guilt in their definition of psychological control. De Kemp et al. (2006) found that in a sample of young Dutch adolescents, parent psychological control was positively related to levels of adolescent delinquent behavior 6 months later.

Given that low levels of psychological autonomy granting imply both the absence of opportunities for independence and the presence of hurtful, demeaning parental behaviour, a link with antisocial behaviour may be a function of either poor self-regulation abilities, or increased negative affect with which youth may cope by engaging in externalizing behaviour. Speaking to the latter possibility, Gray and Steinberg (1999) found that parental psychological control predicted internalizing problems in the child, including internal distress and negative affect. Additionally, the frustration-aggression hypothesis suggests that when negative affect such as frustration increases, externalizing problems such as aggression increase as well (Dollard, Doob, Miller, Mowrer, & Sears, 1939; Berkowitz, 1993). Furthermore, Reker (2009) found that the relations between low levels of mother and father psychological autonomy granting and high levels of reactive-relational and reactive-overt forms of aggression displayed in adolescents was significantly mediated by increased negative affect (i.e., frustration).

Moreover, results from studies conducted by Vierhaus and Lohaus (2009) and Zhou et al. (2008) provide strong support of the relationship between anger/frustration and externalizing as a means of coping. It was found that anger-inducing situations elicited externalizing emotional coping (Vierhaus & Lohaus, 2009) and that anger/frustration was positively related to destructive coping (e.g., acting out) and

negatively related to constructive coping strategies (Zhou et al., 2008). Also in line with this notion, items on the Instrumental Anger scale of the Adolescent Anger Rating Scale (AARS; Burney & Kromrey, 2001) refer to acts of antisocial behaviour, such as property destruction, fighting, violence involving weapons, fire-setting, and rule-breaking as responses in which youth might engage when angry.

Parental monitoring knowledge. The third construct, parental monitoring knowledge, involves the degree to which parents are knowledgeable concerning their children's activities, friendships, and whereabouts. Generally speaking, within this vein of research, the beneficial effects of parental monitoring and knowledge have been well-documented (Stattin & Kerr, 2000). As Stattin and Kerr (2000) note, the general findings purported that adolescents who were poorly monitored were also more "antisocial, delinquent, or criminal" (p.1072). The reason being is that parental monitoring is intended to afford parents the opportunity to deter antisocial behaviors in their adolescents and to intervene if necessary to discipline adolescents for rule-breaking behaviour. Accordingly, this type of monitoring has been found to be linked with less involvement in problem behaviours such as substance abuse and delinquency (Gray & Steinberg, 1999).

Another major mechanism through which parental monitoring is thought to reduce antisocial behaviour is by limiting opportunities for unsupervised interaction with antisocial peers. For example, Dishion et al. (1996) found that antisocial adolescents engaged with their friends in a process called deviancy training, whereby conversations that focused on rule-breaking topics were reinforced through laughing and other positive expressions of affect. The greater the degree of deviancy training observed, the higher

was the level of involvement in delinquent behaviour two years later (Dishion et al., 1996). Dishion and colleagues recommended that parents should closely monitor their children to prevent interactions with delinquent peers that could result in deviancy training. This intervention approach was based on previous findings which showed that high degrees of parental monitoring were associated with lesser involvement with delinquent peers (Piquero, Brezina, & Turner, 2005; Brown, Mounts, Lamborn & Steinberg, 1993).

More recently, however, the protective benefit of parental monitoring per se has been questioned, and the role of parental knowledge in its stead has been recognized as the important predictor of adolescent antisocial behavior. Although it was previously assumed that parental monitoring implied parental action such as surveillance and keeping track of the child's behaviour and whereabouts, current studies suggest that parental monitoring may be more appropriately labelled parental knowledge without a definite implication about how the parents obtain information regarding their child's behaviour and whereabouts (Stattin & Kerr, 2000).

Indeed, there are different ways in which parents may come to be knowledgeable regarding their child's daily activities, such as, through child disclosure, parent solicitation of information, or through behavioural control exercised in the form of rules and restrictions (Kerr, Stattin, & Trost, 1999). And in fact, Willoughby and Hamza (2011) found that voluntary adolescent disclosure was the best predictor of parental knowledge, perhaps due to its relation to trust. Furthermore, this type of parental knowledge has been shown to reduce norm-breaking behavior in children and their contact with police (Stattin & Kerr, 2000). Therefore, the emphasis in the current study

was placed on parental knowledge, and not on how the information was specifically obtained. Further to this point, even though parental knowledge is not equivalent to behavioural control or discipline, they are significantly positively related (Patterson & Stouthamer-Loeber, 1984). As well, monitoring knowledge provides a starting point for effective, consistent discipline, insofar as it enables parents to determine when rule-breaking behaviour has occurred. Thus, for the purposes of this study, parental knowledge was considered an indicator of external regulation on adolescent behaviour.

Friends' Antisocial Behaviour

Adolescence marks a period of transition in many areas, including the quality and function of social relationships. This transition is partly displayed in the dramatic shift that takes place in adolescents' reference group orientation from parents to peers (Gecas & Seff, 1990). Accordingly, Gecas and Seff (1990) recognized that it is necessary to study adolescents within the context that their development occurs, which entails a thorough understanding of peer influences on the adolescent as an individual.

It is known that antisocial behavior in adolescence is most likely to occur in a group setting (Warr, 2002). As such, affiliation with a deviant peer group has been referred to as one of the "strongest predictors of adolescent deviant activity" including substance use, smoking, bullying, and antisocial behavior in general (Elliott, Huisinga, & Ageton, 1985). It has been hypothesized that this relationship exists because of the increased susceptibility to peer pressure during adolescence (Berndt, 1979), greater amounts of time spent with peers instead of with parents, and the degree of importance placed on managing one's reputation (Emler & Reicher, 1995) by impressing peers and fitting in during adolescence (Monahan et al., 2009).

Certain individuals may be more inclined to affiliate with a deviant peer group, especially if the child is rejected by the normative peer group because of conduct problems (Patterson, DeBaryshe, & Ramsey, 1989). Thus, adolescents who are already delinquent may seek out or select relationships with similarly deviant peers.

An observational study of discussions between antisocial adolescent friends suggests a process by which friends' antisocial behaviour could increase an adolescent's involvement in antisocial conduct. Dishion et al.'s (1996) classic study of 186 male friendship dyads showed that delinquent friends spent more time discussing rule-breaking topics than non-delinquent dyads, among whom normative topics were discussed at a higher rate. The study also showed an escalation in antisocial behaviours two years later in those dyads who self-reported delinquency and had record of previous police contact or arrests. The increase in antisocial behaviour was attributed to the reinforcing of antisocial values in conversation through positive affective reactions like laughter and smiling immediately following rule-breaking discourse. This study is foundational in appreciating how deviant peers encourage adolescents to engage in antisocial behaviour through a socialization process.

Other similar studies have strongly attested to the notion that adolescence is a time in which the individual is increasingly susceptible to peer pressure (Berndt, 1979), and more likely to engage in deviant activity if the individual associates with deviant peers (Elliott et al., 1985).

Temperament

While parenting and peer factors are notably important in that they relate to antisocial behaviour in adolescence, previous research has shown that various facets of adolescent temperament are also associated with increased externalizing behaviour (Rothbart, 2007). Temperament has been defined by Rothbart, Derryberry, and Posner (1994) as individual differences in emotion, motivation, and attention. Temperament is mostly biologically based, related in part to genetic predispositions, and can be observed in early infancy (Capaldi & Rothbart, 1992). Bates and Pettit (2007) suggested that temperament is relatively early appearing and that it is only relatively stable, as traits develop within the context of their environment.

Reactivity and self-regulation are two fundamental components that comprise the temperament construct. Reactivity is the degree to which an individual is physiologically excited and emotionally aroused by an external stimulus and consequently the degree to which he or she is motivated to respond behaviourally to the particular change in his or her environment (Rothbart & Rueda, 2005). Therefore, reactivity may be subdivided into positive emotionality, also known as surgency, and negative affect, including fearfulness and frustration (Capaldi & Rothbart, 1992). Self-regulation requires the individual to modulate temperamental dispositions and to alter or inhibit behaviours (Heatherton, 2011) to ensure that the individual responds appropriately to a given situation or event (Rothbart et al., 1994). Thus, self-regulation involves such processes as effortful control. Each of these specific temperament characteristics are considered in turn below.

Surgency. This aspect of positive emotionality involves one's sensitivity to reward, and may be evidenced in approach behaviours toward activities involving high-

intensity pleasure such as skydiving. In relation to antisocial behaviour, individuals who are high in surgency and who are greatly motivated by reward tend to experience the benefits and gains of the misbehaviour as highly salient and enticing (Pardini, Lochman, & Frick, 2003). This is thought to encourage the adolescent to engage in antisocial behaviour, as indicated by research linking extraversion/surgency to greater externalizing problems (Rothbart, 2007).

Fearfulness. Fearfulness and distress may be observed as withdrawal when faced with undesired consequences or as behavioural inhibition when presented with stimuli that are threatening (Rothbart, 2007). Individuals who are low in fearfulness in punishment situations or in situations in which future punishment is the likely outcome of present misbehaviours (Pardini et al., 2003) tend to be less affected by positive forms of punishment such as yelling and threatening.

This form of negative affect may also involve feelings of guilt or remorse over actions that are hurtful to others. However, individuals who do not experience or express this type of negative affect may be described as unempathic or fearless (Frick & Morris, 2004). Indeed, low levels of fear and empathy may translate into a lack of concern or a certain callousness regarding deviations from, and violations of, societal norms (Frick & White, 2008). Individuals with a low capacity for empathy may lack empathy-related guilt as well, with a limited understanding of, or caring about, the pain or hurt caused through the violation of societal norms. In fact, a recent research review conducted by Frick and White (2008) demonstrated the importance of callous-unempathic traits in predicting membership in a subgroup of adolescents who engage in more severe and stable patterns of antisocial behaviour.

On the other end of the fearfulness spectrum, are those individuals who experience high levels of fear and distress regarding adverse situations. To these individuals, the fear associated with any given misbehaviour may be effective as a reactive inhibition component (Rothbart, 2007) and may, in and of itself, effectively deter antisocial behaviour. As such, reactive control serves the function of an “emotional brake” that automatically and passively inhibits behaviour, in contrast to effortful control, which requires the individual to consciously and actively think through the consequences of his or her behaviour in advance (Valiente, Eisenberg, Smith, Reiser, Fabes, Losoya, Guthrie, & Murphy, 2003). In fact, Lengua and Kovacs (2005) suggested that children who are high in fear may be easier to discipline, as there are associations between fearfulness and compliance in children, whereas individuals who are low in fear are often less inhibited behaviourally as they experience low levels of autonomic arousal. Accordingly, they are likely to seek out thrilling and dangerous experiences, including covert antisocial behaviours like theft or vandalism (Frick & Morris, 2004).

Frustration. Another type of negative emotionality is frustration and this temperament trait indicates one’s proneness to anger and irritability, especially upon the interruption of ongoing tasks like in the case of goal blocking (Rothbart, 2007). As has been previously mentioned, frustration is related to externalizing problems like aggression (Berkowitz, 1993; Reker, 2009), and may be associated with other antisocial behaviours as well.

Effortful control. This self-regulating process has been defined as “the ability to inhibit a dominant response to perform a subdominant response, to detect errors, and to engage in planning (p.169)” (Rothbart & Rueda, 2005). If reactive control represents an

emotional brake, then effortful control may be thought of as the “cognitive brake” that actively involves thinking through the probable outcomes associated with a decision, and acting accordingly. Typically, self-regulative behaviours like effortful control are negatively related with externalizing behaviours (Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, & Suh, 1996; Rothbart, 2007). Individuals who have difficulty self-regulating are prone to acting impulsively in decision-making situations. If these individuals are also prone to reactive aggression, or aggressing under provocation, they may be described as emotionally-dysregulated and they may constitute a unique group of antisocial adolescents (Nigg, 2006). Zhou et al. (2008) found that low effortful control and a propensity toward high frustration upon goal blocking or task interruptions were distal risk factors indirectly associated with externalizing problems. Perhaps more to the point, Valiente, Lemery-Chalfant, and Reiser (2007) found that effortful control was negatively related to externalizing problem behaviours (i.e., aggression and delinquency) among 7 to 12 year old children.

The Moderating Role of Temperament

Despite the clear importance of temperament as it relates to the onset of antisocial behaviour, there seems to be only a small body of research regarding how certain temperament traits might differentially modify the relationship between parenting and peer variables and antisocial behaviour. Several exceptions are worth noting. Stice and Gonzales (1998) found that parenting practices like support and control mitigated the effects of behavioural undercontrol and negative affectivity on antisocial behaviour and substance use 6 months later among a sample of 16 to 19 year olds. Lengua (2008) found evidence supporting the moderating effect of anxiousness, frustration, and effortful

control on the relation between maternal rejection, inconsistent discipline, and physical punishment and internalizing and externalizing behaviours in a small sample ($N = 188$) of 8 to 12 year olds. Karreman, van Tuijl, van Aken, and Deković (2009) found that effortful control significantly interacted with parental positive control in the prediction of concurrent externalizing problems in a small sample ($N = 89$) of 3 year old children, such that when effortful control was low, low levels of parental positive control (limit setting, provision of structure, and sensitivity) predicted higher levels of conduct problems and hyperactivity. Padilla-Walker and Nelson (2010) found that adolescents' perceptions about the appropriateness of their mothers' reactions to hypothetical situations (e.g., upon learning the child had lied to the mother, upon learning the child had been drinking or smoking) were related to lower externalizing behaviours in boys who were low in fearfulness. Additionally, Snyder, McEachern, Schrepferman, Just, Jenkins, Roberts, and Lofgreen (2010) found in a young sample ($N = 267$) that child impulsivity (a composite measure of poor executive control) measured at 5 years of age moderated the relationship between peer deviancy training (modeling and positively responding to norm-violating discourse and play) and externalizing behaviour measured using the Youth Self Report (YSR; Achenbach, 1991) when the children were 9 years old. The present study will extend the scanty literature in this area.

Hence, the main research question of this study was *do certain temperament traits (namely, fearfulness, surgency, effortful control, and frustration) modify the association between authoritative parenting dimensions and friends' antisocial behaviour with self-reported antisocial behaviour among 13 to 17 year old adolescents?* The six main hypotheses derived from theory and previous literature are outlined below.

Hypotheses

Acceptance-involvement by fearfulness. It was hypothesized that there would be an interaction between parent acceptance-involvement and adolescent fearfulness. More specifically, fearfulness was expected to moderate the relation between parental acceptance-involvement and adolescent antisocial behaviour, such that high levels of acceptance-involvement would be associated with lower displays of antisocial behaviour for children who were low in fearfulness, relative to those who were high in fearfulness. This hypothesis was based in part on the finding that children who are high in fear are typically more compliant by nature (Lengua & Kovacs, 2005), and therefore a high degree of fearfulness was not expected to significantly modify the association between acceptance-involvement and antisocial behaviour.

More to the point, this hypothesis was also based on Kochanska's (2002) discussion that a "close, mutually binding, cooperative, and affectively positive" parent-child relationship described as a mutually responsive orientation was particularly important in the development of conscience for relatively fearless children. As previously mentioned, this type of relationship fosters moral development in children so that children become willing "to embrace parental values and standards for behaviour" because of positive feelings that they associate with prosocial behaviour and relationships. Therefore, because of the value that children attribute to this type of relationship, and because the child has adopted a responsive stance to the parents' standards for behaviour, children who were low in fearfulness were expected to adopt parental values in order to please their parents, not due to a fear of punishment, because

the parents' praise would be considered highly rewarding, as would be the positive relationship itself.

Friends' antisocial behaviour by fearfulness or friends' antisocial behaviour by surgency. Second, it was hypothesized that fearfulness or surgency would moderate the relationship between friends' antisocial behaviour and antisocial behaviour in adolescents. More specifically, it was predicted that friends' antisocial behaviour would have a stronger relation with antisocial behaviour among adolescents in whom fearfulness was low or surgency was high.

The rationale was that fearfulness and surgency would operate in tandem but at different intensities so that a low sensitivity to punishment (e.g., low reactive control) and a heightened sensitivity to reward would alter or strengthen the relation between friends' antisocial behaviour and adolescent antisocial behaviour. The threat of punishment as a likely consequence to misbehaviour would not carry enough weight to tilt the scale in favour of abstaining from antisocial behaviour in relatively fearless adolescents, or in other words, because of low reactive control, punishment would not evoke sufficient anxiety or distress to deter antisocial behaviour. As a result, the reward associated with the antisocial deed would carry more weight in the adolescent's decision making, and especially so for individuals who are high in surgency. Adolescents who are high in fearfulness, on the other hand, would display less antisocial behaviour despite affiliating with antisocial friends, because the threat of punishment would effectively curb their antisocial behaviours through reactive control, or the evocation of temperamental fear and anxiety.

This hypothesis was based on work by Dishion et al. (1996) regarding deviancy training, as well as the theory that those who are low in fearfulness are often reward dominant and have heightened sensitivity to reward. Dishion et al. (1996) suggested that adolescents' antisocial behaviours are richly positively reinforced, thereby facilitating the perpetuation of antisocial behaviour. More specifically, the authors found that when discourse between friends regarding rule-breaking behaviour was encouraged through expression of positive affect such as laughter, delinquent behaviour in the dyads escalated two years later.

Friends' antisocial behaviour by effortful control. The third hypothesis was that effortful control would moderate the association between friends' antisocial behaviour and adolescent antisocial behaviour, such that friends' antisocial behaviour would be more strongly related to the outcome variable when adolescents did not self-regulate well. This hypothesis was based on the theoretical rationale that children low in effortful control would be less likely than children high in effortful control to consider the consequences of antisocial conduct and would therefore be more susceptible to following the lead of antisocial peers. As well, this hypothesis was based on a previous finding that showed that child impulsivity moderated the relationship between peer deviancy training and externalizing behaviour in a study of young children conducted by Snyder et al. (2010).

Knowledge by fearfulness. The fourth hypothesis was that fearfulness would moderate the association between parental monitoring knowledge and adolescent antisocial behaviour, such that this form of external regulation would be less effective for individuals who are low in fearfulness. This hypothesis stemmed from work done by

Stattin and Kerr (2000) regarding parental knowledge as a form of external regulation. The premise was that this type of control would be less effective for those who are relatively fearless of punishment. Those individuals who are high in fearfulness would benefit to a greater degree from parental monitoring knowledge as the threat of parental punishment for inappropriate behaviour would deter them from engaging in antisocial behaviour. For these adolescents, parental knowledge would have a stronger relation with antisocial behaviour.

Knowledge by effortful control. Fifth, it was hypothesized that there would be an interaction between parental knowledge and effortful control, such that effortful control would moderate the relationship between parental monitoring knowledge and adolescent antisocial behaviour. It was believed that monitoring would have a stronger association with antisocial behaviour when effortful control was low, consistent with previous research showing this to be the case in regard to childhood aggression (Colder et al., 1997). This is likely due to the fact that monitoring through practices like limit setting, which increases attention to consequences of rule-breaking, reduces exposure to circumstances where impulsivity or an inability to self-regulate might get a child into trouble. Therefore, it was predicted that this form of external regulation would be able to offset, or compensate for, individual deficiencies in self-regulation.

Psychological autonomy granting by frustration by sex. Lastly, it was hypothesized that frustration would moderate the association between parental psychological autonomy granting and adolescent antisocial behaviour, such that low levels of psychological autonomy granting (or in other words, excessive psychological control and high levels of parental intrusiveness) would be related to more negative affect.

in children high in frustration. It was reasoned that this pattern would exist mainly for boys.

This hypothesis was based on the notion that excessive psychological control often engenders intense feelings of guilt, shame, and sadness in the adolescent. Most importantly, the restrictiveness of the parent would be related to extreme feelings of frustration in the adolescent as their goals and desires to act autonomously and express their individuality are being blocked (Soenens & Vansteenkiste, 2010). The frustration-aggression hypothesis as outlined by Dollard et al. (1939) suggests that such frustration leads to aggression. Similarly, it was supposed that negative affect would be expressed as antisocial behaviour because antisocial behaviour would be used as a form of emotion regulation, or coping through externalizing means. Vierhaus and Lohaus (2009) found that forms of externalizing emotional coping such as *"I take out my annoyance on somebody else"* were employed by children when coping with anger-inducing situations. Zhou et al. (2008) reported findings that indicated a negative relationship between anger/frustration and constructive coping and the inverse relationship between anger/frustration and destructive coping (e.g., acting out). In other words, antisocial behaviour may be a way, albeit a destructive one, in which emotionally distressed adolescents cope with their frustration.

In addition to this particular interaction, it was further hypothesized that this relation would be the case for boys but not for girls, because girls tend to cope with negative affect differently, particularly through internalizing means manifested in depression or anxiety (Karreman, de Haas, van Tuijl, van Aken, & Dekovic, 2010). Indeed, Capaldi and Rothbart (1992) stated that there is a greater prevalence of depression in female

adolescents than in male adolescents. As well, Van Hulle et al. (2007) proffered that girls differ from boys in their expression of delinquency, and reported that girls require more liability than boys do to display the same level of delinquency. In the context of this hypothesis, it was thought that girls might not display antisocial behaviour as a result of frustration if they instead coped through internalizing means. Additionally, findings from de Kemp et al. (2006) suggest that boys experience, or at least perceive and report, higher levels of parental psychological control than girls do. Therefore, this hypothesis was thought to apply more readily to boys than to girls.

Method

Participants

Data for the present study were obtained from a dataset that was collected for a research initiative focused on youth gambling and related risk factors for which the original sample consisted of 674 families of 10 to 17 year olds. Because the purpose of this study was to investigate temperament as a moderator of parenting and peer factors among adolescents, analyses for this study were based on a sample of 484 mothers and their adolescent children (54.8% female) between the ages 13 and 17 years ($M = 14.96$ years, $SD = 1.39$).

In terms of marital status, 73% of the mothers were married, 5.2% remarried, 6.6% were in common-law relationships, and 14% were single parents (never married, divorced/separated or widowed). In regard to ethnicity, 72% identified themselves as Canadian, 16% as European (of which 4.5% were Italian), 4% comprised small groups of diverse ethnicities including Asian, South American, African, American, and Native Canadians, and the remaining 8% of the sample did not specify an ethnicity. The highest

level of education completed was high school for 41% of the mothers, and post-secondary degrees were attained by 59% of the mothers. Median household income was \$70,000.

Measures

Demographic information. Adolescents self-reported information concerning their age and sex. Mothers reported their marital status, the ethnic/cultural group they belonged to, their level of education, and their total household income.

Temperament. Temperament traits were assessed using self-report of the Early Adolescent Temperament Questionnaire – Revised (EATQ-R; Ellis & Rothbart, 2001) and mother-report of the Early Adolescent Temperament Questionnaire – Parent Report. Four subscales of the EATQ-R were used in the present study. For each item, adolescents indicated how true the statement was of themselves and mothers indicated how true the statement was of their child on a Likert-type scale, ranging from (1) “almost always untrue” to (5) “almost always true”.

The Surgency subscale ($\alpha = .75$) consisted of 9 mother-report and 5 self-report items such as “I would not be afraid to try a risky sport, like deep sea diving.” The Fearfulness subscale ($\alpha = .75$) consisted of 6 mother-report and 6 self-report items such as “I worry about getting into trouble.” The Frustration subscale ($\alpha = .68$) consisted of 4 mother-report and 7 self-report items such as “I get very upset if I want to do something and my parent(s) won’t let me.” The Effortful Control subscale consisted of 18 mother-report and 14 self-report items that tapped Inhibitory Control (e.g., “It’s easy for me to keep a secret”), Activation Control (e.g., “If I have a hard assignment to do, I get started

right away”), and Attention (e.g., “I pay close attention when someone tells me how to do something”), which had a high level of internal consistency ($\alpha = .90$).

Authoritative parenting. Three dimensions of authoritative parenting were rated both by mothers and children using the Authoritative Parenting measure comprised of three subscales (Gray & Steinberg, 1999).

The Acceptance-Involvement subscale ($\alpha = .72$) consisted of 9 mother-report and 9 self-report items that measured the extent to which the adolescent perceived his parents as loving, responsive, and involved. A sample item is “She helps me with my schoolwork if there is something I don’t understand” to which respondents could (1) strongly disagree, (2) disagree somewhat, (3) agree somewhat, or (4) strongly agree.

The parental Monitoring Knowledge scale ($\alpha = .76$) consisted of 6 mother-report and 6 self-report items that measured the extent to which parents were knowledgeable regarding how adolescents spent their time outside of school and with peers. A sample item is “How much does your mother really know what you do with your free time?” Respondents could indicate that (1) she never knows, (2) she sometimes knows, (3) she usually knows, or (4) she always knows. Thus, this supervision scale primarily tapped the parental knowledge domain.

The Psychological Autonomy Granting scale ($\alpha = .82$) consisted of 9 mother-report and 9 self-report items that measured the extent to which parent(s)/guardian(s) employed non-coercive, democratic discipline and encouraged the adolescent to express individuality in the family. A sample item is “She lets me make my own plans for things I want to do,” to which participants could (1) strongly disagree, (2) disagree somewhat, (3) agree somewhat, or (4) strongly agree.

Friends' antisocial behaviour. This factor was assessed using the Peer Delinquency Scale ($\alpha = .81$) which asked the adolescents seven questions such as, "In the past year, how many of your close friends have purposely damaged or destroyed property that did not belong to them" (Loeber, Farrington, Stouthamer-Loeber, and Van Kammen, 1998). Participants indicated (1) none, (2) few, (3) half, (4) most, or (5) all of them.

Adolescent antisocial behaviour. The outcome variable was measured using the Self-Reported Delinquency Questionnaire (SRDQ; Le Blanc and Fréchette, 1989). The SRDQ contains 19 items and three subscales. A sample item from the Violence subscale ($\alpha = .78$) is "In the past year, how often have you used a weapon (stick, knife, gun, rocks) in fighting with someone else?" A sample item from the Theft subscale ($\alpha = .87$) is "In the past year, how often have you taken and kept something worth between \$10 and \$100 that didn't belong to you?" A sample item from the Vandalism subscale ($\alpha = .73$) is "In the past year, how often have you purposely broken or destroyed something belonging to your parents or another family member?" Adolescents could indicate (1) never, (2) once or twice, (3) several times, or (4) quite often.

Results

Plan of Analysis

To reiterate, the hypotheses of this study predicted that various temperament characteristics would modify the strength or form of the relationship between parent and peer predictors and adolescent antisocial behaviour. Therefore, interaction effects were tested with a series of multiple hierarchical regression analyses. In total, eight main regressions were conducted, to test whether each of the four predictors (parental acceptance-involvement, monitoring knowledge, psychological autonomy granting, and

friends' antisocial behaviour) were related to antisocial behaviour, and whether these links were moderated by temperament, as well as age and sex.

All statistical analyses were performed using PASW Statistics 18. Because data included mother and child reports for the measures concerning temperament and authoritative parenting, composite scores were computed for each of the temperament characteristics and each of the authoritative parenting dimensions by summing and averaging the values provided from the mother and child pairs. The mean variables were computed for the composite parenting, composite temperament, self-reported friends' antisocial behaviour, and self-reported antisocial behaviour scores for which there were at least 50% of the data present in any given variable.

In the main regression analyses, age and sex were entered simultaneously on the first step of each regression, because they would be used in later steps as part of the interaction terms. Either a parenting or peer predictor and the four temperament variables were entered simultaneously on the second step of each regression. Product terms for two-way interactions between the parenting or peer predictor in question and each of the four temperament variables were entered simultaneously on the third step of each regression. The fourth step of each regression tested for two-way interactions between the parenting or peer predictor in question and each one of the temperament variables simultaneously with one of the demographic variables. The fifth step of each regression tested three-way interactions between the parenting or peer predictor, each of the temperament variables, and one of the demographic variables, age or sex.

Preliminary Analyses

The assumption of normality and the possibility of outlying values were assessed by examining the appropriate skewness and kurtosis statistics, standardized scores, and histograms for each variable. The criterion variable, adolescent antisocial behaviour ($n = 482$), was not normally distributed. Instead, it was positively skewed and leptokurtic with the majority of the values falling to the left of the distribution ($M = 1.18$, $SD = 0.24$). As well, five cases that fell more than 3.29 standard deviations from the mean based on the z distribution were identified as outliers (Tabachnick & Fidell, 2007). A \log_{10} transformation was applied to normalize the distribution. After the transformation, levels of skewness (1.63) and kurtosis (3.50) were within an acceptable range based on cutoff scores of 2 and 7 for skewness and kurtosis values, respectively (West, Finch, & Curran, 1995), and the distribution appeared more normal ($M = 0.06$, $SD = 0.08$).

Upon examining the standardized scores of the other continuous variables, several univariate outliers were identified for acceptance-involvement, frustration, and friends' antisocial behaviour, but these cases fell within the normal range for each of the other variables. There were no outliers observed for effortful control, surgency, fear, psychological autonomy granting, or monitoring knowledge. Table 1 provides the descriptive information regarding the predictor variables which, upon examination of the histograms and the skewness and kurtosis statistics for these variables, all seemed to be mostly normally distributed. Furthermore, a Missing Value Analysis was conducted but because there were so few cases of missing data (i.e., less than 3%) for each variable, it was decided that imputation techniques were not needed.

Table 1

Means and Standard Deviations of Temperament, Parenting, and Peer Variables

| Predictor | <i>M (Min-Max)</i> | <i>SD</i> | <i>n</i> |
|---------------------------------|--------------------|-----------|----------|
| Fearfulness | 2.70 (1.17-4.50) | 0.60 | 484 |
| Surgency | 3.44 (1.71-4.86) | 0.57 | 484 |
| Effortful Control | 3.47 (1.72-4.72) | 0.55 | 484 |
| Frustration | 3.23 (1.08-5.00) | 0.53 | 484 |
| Psychological Autonomy Granting | 2.87 (1.56-3.83) | 0.42 | 484 |
| Acceptance-involvement | 3.47 (2.22-4.00) | 0.31 | 484 |
| Monitoring Knowledge | 3.73 (2.75-4.00) | 0.33 | 483 |
| Friends' Antisocial Behaviour | 1.78 (1.00-4.43) | 0.65 | 482 |

The assumption of linearity was met as determined by examining the bivariate relations between each predictor and antisocial behaviour as displayed with simple scatter plots. Table 2 presents the zero-order intercorrelations among each of the parenting, peer, and temperament predictors and antisocial behaviour. In regard to each of the temperament predictors, it appeared that those who scored higher on frustration proneness or surgency, or lower on fearfulness or effortful control, also reported higher levels of antisocial behaviour. In regard to the peer predictor, it appeared that those who reported more friend involvement in delinquent activity reported higher levels of antisocial behaviour. And in terms of each of the parenting predictors, it appeared that more psychological autonomy granting, more acceptance-involvement, and more monitoring knowledge were each related to lower levels of antisocial behaviour.

Table 2

Intercorrelations Among Authoritative Parenting, Temperament, Friends' Antisocial Behaviour and Adolescent Antisocial Behaviour

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------------------|---------|---------|--------|---------|-------|---------|---------|--------|---|
| 1. Psychological Autonomy Granting | 1 | | | | | | | | |
| 2. Acceptance-Involvement | .20*** | 1 | | | | | | | |
| 3. Monitoring Knowledge | .05 | .24*** | 1 | | | | | | |
| 4. Fearfulness | -.16*** | .20*** | .07 | 1 | | | | | |
| 5. Surgency | -.00 | -.04 | .16*** | -.35*** | 1 | | | | |
| 6. Frustration | -.36*** | -.12** | .00 | .34*** | -.09 | 1 | | | |
| 7. Effortful Control | .33*** | .27*** | .14** | -.01 | .07 | -.39*** | 1 | | |
| 8. Friends' Antisocial Behaviour | -.10* | -.18*** | .07 | -.13** | .13** | .21*** | -.28*** | 1 | |
| 9. Adolescent Antisocial Behaviour | -.14** | -.19*** | -.15** | -.20*** | .15** | .13** | -.32*** | .48*** | 1 |

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

To avoid problems associated with multicollinearity, the continuous variables were centered by subtracting the mean from the corresponding predictor. Additionally, the possibility of curvilinearity among related variables was assessed because a curvilinear relationship may be masked as an interaction. According to these tests, there was no evidence of curvilinearity except in the case of acceptance-involvement; the main effect accounted for 3.4% of the variance in antisocial behaviour, and the two-way effect accounted for an additional 2% of the variance ($R^2_{\Delta} = .02$, $F_{\Delta(1,479)} = 8.85$, $p = .003$). Because the unstandardized B coefficient was negative (-.07), the curvilinear pattern of acceptance-involvement rose first and then fell. Two follow up regressions were conducted to see if the curvilinearity of acceptance-involvement interacted with any of the temperament predictors or age or sex, but because none of the interactions in either of these two follow up tests were significant, the curvilinear acceptance-involvement term was not included in the main regression analyses.

The assumption regarding homoscedasticity was examined using scatter plots of the standardized residuals and the standardized predicted values with horizontal and vertical lines set at zero and observing whether the residuals were evenly distributed between the four quadrants. This method indicated a slight violation of the assumption. The normal distribution of the errors was checked by viewing the standardized residual histograms and the P-P plots of the observed and expected probabilities. Examination of these graphs suggested the errors were mostly normally distributed although they were slightly positively skewed. Generally, examination of the casewise diagnostics tables indicated only a few cases whose standardized residual values were more than +3 (there were none that were less than -3). More particularly, there was one case that consistently

had a high standardized residual exceeding +3 indicating that the predicted score was significantly lower than the actual antisocial behaviour score. However, the independence of residuals assumption was tested using the Durbin-Watson statistic which ranges from 0 to 4 (Durbin & Watson, 1951). Typically, residuals are said to be independent if the statistic falls between 1.5 and 2.5. This assumption was met for each of the eight main regressions that were conducted. Additionally, upon examination of leverage values, and Mahalanobis and Cook's distances for each of the regressions, there were no outliers found in the solution that also had extreme values for these statistics. Therefore, it was decided that the main regression analyses were non-problematic and that they did not need to be re-run with identified cases removed.

Main Regression Analyses

The results of the regressions are displayed in Tables 3 through 6. As Table 3 shows, the main effect for age when predicting antisocial behaviour was non-significant, but sex significantly predicted antisocial behaviour, $t(479) = -3.27, p = .001$, with boys scoring higher than girls. In terms of the temperament predictors, the main effects of fearfulness and effortful control were significant in each regression, whereas surgency was significant when controlling for the three aspects of authoritative parenting (Tables 3 through 5), but not when friends' antisocial behaviour was entered as a predictor (Table 6). Finally, frustration was a non-significant predictor in each of the regression analyses.

Regressions testing psychological autonomy granting, age, and sex. As Table 3 shows, the main effect for psychological autonomy granting on adolescent antisocial behaviour was non-significant. Not only that, but contrary to what was hypothesized,

results did not support an interaction between psychological autonomy granting, frustration, and sex when predicting antisocial behaviour.

Regressions testing acceptance-involvement, age, and sex. As Table 4 shows, the main effect for acceptance-involvement was non-significant when predicting antisocial behaviour, and furthermore, contrary to my expectation, fearfulness did not moderate the relation between acceptance-involvement and antisocial behaviour.

Regressions testing monitoring knowledge, age, and sex. Monitoring knowledge significantly explained an additional proportion of the variance in antisocial behaviour, above and beyond temperament and demographic variables. As displayed in Table 5, monitoring knowledge explained an additional 1% of the variance in antisocial behaviour, $F_{\Delta(1,474)} = 17.95, p < .001$. In accordance with what was hypothesized, there was a significant interaction found for parental monitoring knowledge by effortful control, $t(470) = 3.49, p = .001$. In addition, an unanticipated finding was discovered, a significant monitoring knowledge by frustration by sex interaction, $t(461) = -2.18, p = .029$. However, results did not support an interaction between monitoring knowledge and fearfulness, as had been hypothesized.

Regressions testing friends' antisocial behaviour, age, and sex. Friends' antisocial behaviour significantly explained an additional proportion of the variance in antisocial behaviour, above and beyond temperament and demographic variables. As displayed in Table 6, friends' antisocial behaviour explained an additional 18% of the variance in antisocial behaviour, $F_{\Delta(1,473)} = 46.04, p < .001$. Although the original hypothesis concerning an interaction between friends' antisocial behaviour and effortful control was not sex-specific, there was found a significant interaction for friends'

antisocial behaviour by effortful control by sex, $t(460) = -2.83$ $p = .005$. Yet another unanticipated finding was a significant interaction for friends' antisocial behaviour by age, $t(464) = -4.20$, $p < .001$. Lastly, contrary to what was hypothesized, fearfulness did not significantly moderate the relation between friends' antisocial behaviour and adolescent antisocial behaviour.

Table 3

Summary of Hierarchical Multiple Regression Analyses Predicting Adolescent Antisocial Behaviour (Psychological Autonomy Granting, (a) Age, (b) Sex)

| | Variable(s) | R^2 | R^2_{Δ} | β | sr^2 |
|---------|------------------|-------|----------------|---------|--------|
| Step 1 | Age | .02 | .02** | -.02 | .00 |
| | Sex | | | -.15** | .02 |
| Step 2 | PAG | .17 | .15*** | -.05 | .00 |
| | Fearfulness | | | -.19*** | .03 |
| | Surgency | | | .11* | .01 |
| | Frustration | | | .08 | .00 |
| | EC | | | -.28*** | .06 |
| Step 3 | PAG x Fear | .17 | .00 | -.03 | .00 |
| | PAG x Surg | | | .03 | .00 |
| | PAG x Frus | | | .04 | .00 |
| | PAG x EC | | | .06 | .00 |
| Step 4a | PAG x Age | .18 | .01 | .26 | .00 |
| | Fear x Age | | | -.54 | .00 |
| | Surg x Age | | | -.10 | .00 |
| | Frus x Age | | | .54 | .00 |
| | EC x Age | | | .70 | .00 |
| Step 4b | PAG x Sex | .18 | .01 | -.03 | .00 |
| | Fear x Sex | | | .01 | .00 |
| | Surg x Sex | | | -.09 | .00 |
| | Frus x Sex | | | .04 | .00 |
| | EC x Sex | | | -.07 | .00 |
| Step 5a | PAG x Fear x Age | .18 | .00 | -.19 | .00 |
| | PAG x Surg x Age | | | -.24 | .00 |
| | PAG x Frus x Age | | | .05 | .00 |
| | PAG x EC x Age | | | .08 | .00 |
| Step 5b | PAG x Fear x Sex | .19 | .00 | .02 | .00 |
| | PAG x Surg x Sex | | | .04 | .00 |
| | PAG x Frus x Sex | | | .12 | .00 |
| | PAG x EC x Sex | | | .07 | .00 |

Note. PAG = psychological autonomy granting; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4

Summary of Hierarchical Multiple Regression Analyses Predicting Adolescent Antisocial Behaviour (Acceptance-Involvement, (a) Age, (b) Sex)

| | Variable(s) | R^2 | R^2_{Δ} | β | sr^2 |
|---------|-----------------|-------|----------------|---------|--------|
| Step 1 | Age | .02 | .02** | -.02 | .00 |
| | Sex | | | -.15** | .02 |
| Step 2 | AI | .17 | .15*** | -.07 | .00 |
| | Fearfulness | | | -.17*** | .02 |
| | Surgency | | | .12** | .01 |
| | Frustration | | | .09 | .01 |
| | EC | | | -.27*** | .05 |
| Step 3 | AI x Fear | .18 | .00 | -.01 | .00 |
| | AI x Surg | | | -.04 | .00 |
| | AI x Frus | | | .03 | .00 |
| | AI x EC | | | .07 | .00 |
| Step 4a | AI x Age | .18 | .01 | -.01 | .00 |
| | Fear x Age | | | -.63 | .00 |
| | Surg x Age | | | -.17 | .00 |
| | Frus x Age | | | .73 | .00 |
| | EC x Age | | | .95 | .01 |
| Step 4b | AI x Sex | .18 | .01 | .01 | .00 |
| | Fear x Sex | | | .00 | .00 |
| | Surg x Sex | | | -.09 | .00 |
| | Frus x Sex | | | .04 | .00 |
| | EC x Sex | | | -.08 | .00 |
| Step 5a | AI x Fear x Age | .19 | .01 | -.02 | .00 |
| | AI x Surg x Age | | | -.08 | .00 |
| | AI x Frus x Age | | | -.12 | .00 |
| | AI x EC x Age | | | .01 | .00 |
| Step 5b | AI x Fear x Sex | .19 | .01 | -.02 | .00 |
| | AI x Surg x Sex | | | -.09 | .00 |
| | AI x Frus x Sex | | | -.14 | .00 |
| | AI x EC x Sex | | | .03 | .00 |

Note. AI = acceptance-involvement; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 5

Summary of Hierarchical Multiple Regression Analyses Predicting Adolescent Antisocial Behaviour (Monitoring Knowledge, (a) Age, (b) Sex)

| | Variable(s) | R^2 | R^2_{Δ} | β | sr^2 |
|---------|------------------|-------|----------------|---------|--------|
| Step 1 | Age | .02 | .02** | -.02 | .00 |
| | Sex | | | -.15** | .02 |
| Step 2 | Mon | .18 | .16*** | -.12* | .01 |
| | Fearfulness | | | -.17** | .02 |
| | Surgency | | | .14** | .02 |
| | Frustration | | | .09 | .01 |
| | EC | | | -.27*** | .06 |
| Step 3 | Mon x Fear | .20 | .02** | .03 | .00 |
| | Mon x Surg | | | -.01 | .00 |
| | Mon x Frus | | | .06 | .00 |
| | Mon x EC | | | .16** | .02 |
| Step 4a | Mon x Age | .21 | .00 | .14 | .00 |
| | Fear x Age | | | -.69 | .00 |
| | Surg x Age | | | -.19 | .00 |
| | Frus x Age | | | .59 | .00 |
| | EC x Age | | | .43 | .00 |
| Step 4b | Mon x Sex | .21 | .01 | -.01 | .00 |
| | Fear x Sex | | | -.00 | .00 |
| | Surg x Sex | | | -.07 | .00 |
| | Frus x Sex | | | .03 | .00 |
| | EC x Sex | | | -.09 | .00 |
| Step 5a | Mon x Fear x Age | .21 | .00 | .74 | .00 |
| | Mon x Surg x Age | | | .65 | .00 |
| | Mon x Frus x Age | | | -.34 | .00 |
| | Mon x EC x Age | | | -.21 | .00 |
| Step 5b | Mon x Fear x Sex | .23 | .02* | .11 | .00 |
| | Mon x Surg x Sex | | | .07 | .00 |
| | Mon x Frus x Sex | | | -.18* | .01 |
| | Mon x EC x Sex | | | .07 | .00 |

Note. Mon = monitoring knowledge; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6

Summary of Hierarchical Multiple Regression Analyses Predicting Adolescent Antisocial Behaviour (Friends' Antisocial Behaviour, (a) Age, (b) Sex)

| | Variable(s) | R^2 | R^2_{Δ} | β | sr^2 |
|---------|----------------------|-------|----------------|----------|--------|
| Step 1 | Age | .02 | .02** | -.01 | .00 |
| | Sex | | | -.15** | .02 |
| Step 2 | Frnd AB | .34 | .32*** | .49*** | .18 |
| | Fearfulness | | | -.13** | .01 |
| | Surgency | | | .07 | .00 |
| | Frustration | | | .02 | .00 |
| | EC | | | -.18*** | .02 |
| Step 3 | Frnd AB x Fear | .36 | .01 | -.09 | .01 |
| | Frnd AB x Surg | | | .05 | .00 |
| | Frnd AB x Frus | | | .04 | .00 |
| | Frnd AB x EC | | | -.03 | .00 |
| Step 4a | Frnd AB x Age | .39 | .03*** | -2.03*** | .02 |
| | Fear x Age | | | -.51 | .00 |
| | Surg x Age | | | -.26 | .00 |
| | Frus x Age | | | .55 | .00 |
| | EC x Age | | | .86 | .00 |
| Step 4b | Frnd AB x Sex | .36 | .01 | -.09 | .00 |
| | Fear x Sex | | | -.09 | .00 |
| | Surg x Sex | | | -.06 | .00 |
| | Frus x Sex | | | .06 | .00 |
| | EC x Sex | | | -.03 | .00 |
| Step 5a | Frnd AB x Fear x Age | .39 | .00 | -.33 | .00 |
| | Frnd AB x Surg x Age | | | .13 | .00 |
| | Frnd AB x Frus x Age | | | .31 | .00 |
| | Frnd AB x EC x Age | | | .52 | .00 |
| Step 5b | Frnd AB x Fear x Sex | .38 | .02** | -.12 | .00 |
| | Frnd AB x Surg x Sex | | | -.00 | .00 |
| | Frnd AB x Frus x Sex | | | .11 | .00 |
| | Frnd AB x EC x Sex | | | -.22** | .01 |

Note. Frnd AB = friends' antisocial behaviour; * $p < .05$; ** $p < .01$; *** $p < .001$.

Post hoc tests. To clarify each of the significant interactions that were found, simple slopes analyses or analyses of the conditional effects were performed by plotting regression lines for the predictor (e.g., friends' antisocial behaviour; parental monitoring knowledge) at high and low values (± 1 standard deviation from the mean) of the moderating variable (e.g., effortful control, age, frustration), or in the case of sex, for boys and girls. High and low values for friends' antisocial behaviour and monitoring knowledge were also created in cases where the results were more interpretable with these values considered as moderators.

Monitoring knowledge by effortful control. The post hoc test for parental monitoring knowledge by effortful control revealed that the association between parental monitoring knowledge and adolescent antisocial behaviour varied by levels of effortful control. When effortful control was high, monitoring knowledge was not a significant predictor of antisocial behaviour accounting for 0% of its variance ($\beta = .03$, $sr^2 = .00$, $p = .648$). When effortful control was low, however, monitoring knowledge significantly predicted antisocial behaviour accounting for approximately 3% of its variance ($\beta = -.24$, $sr^2 = .03$, $p < .001$). More specifically, the pattern was such that, in the case of low effortful control, high monitoring knowledge was associated with lower levels of antisocial behaviour and low monitoring knowledge was associated with higher levels of antisocial behaviour. The interaction is depicted in Figure 1.

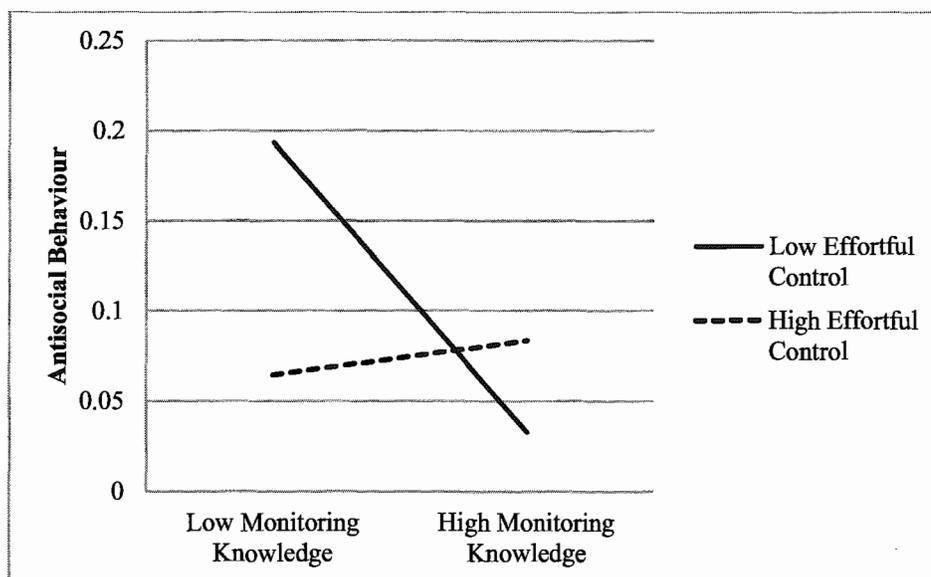


Figure 1. The interaction of monitoring knowledge and effortful control when predicting adolescent antisocial behaviour.

Friends' antisocial behaviour by effortful control by sex. The post hoc test for this interaction revealed that the association between friends' antisocial behaviour and adolescent antisocial behaviour varied by levels of effortful control for girls, but less so for boys. More specifically, for girls, friends' antisocial behaviour was more strongly related to antisocial behaviour when effortful control was low ($\beta = .52, sr^2 = .09, p < .001$) than when it was high ($\beta = .28, sr^2 = .02, p < .001$). See Figure 2.

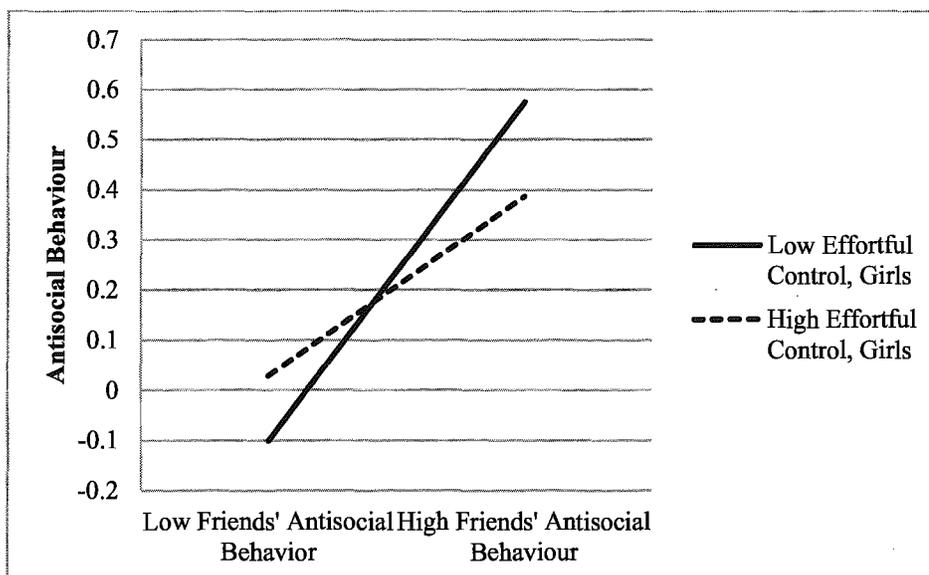


Figure 2. The interaction of friends' antisocial behaviour and effortful control when predicting antisocial behaviour in girls.

For boys, there was less of a difference in the magnitude of the relation between friends' antisocial behaviour and the level of the adolescents' antisocial behaviour at low ($\beta = .45, sr^2 = .04, p < .001$) and high ($\beta = .78, sr^2 = .07, p < .001$) levels of effortful control, and, in contrast to the case for girls, the conditional effect was somewhat stronger when effortful control was high. See Figure 3 for a graphical display of the interaction.

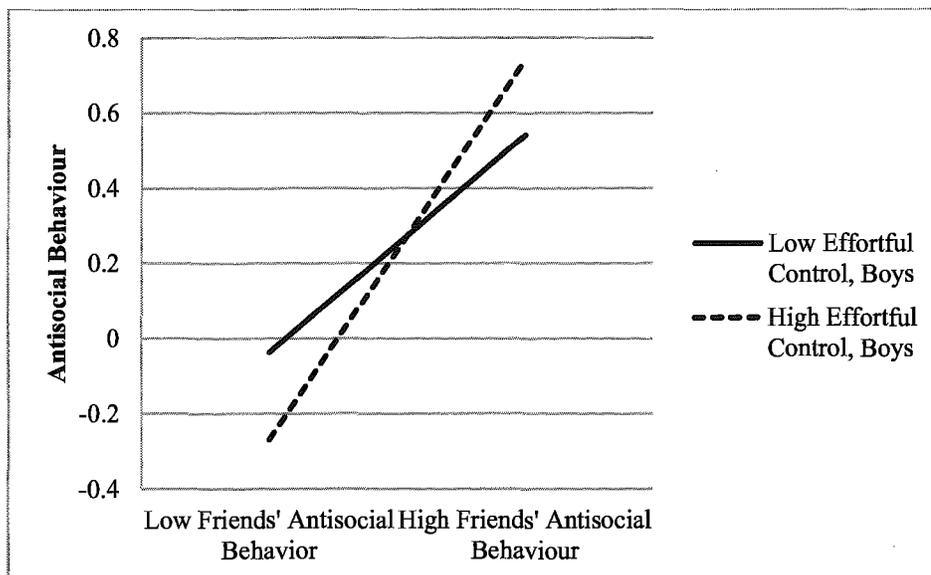


Figure 3. The interaction of friends' antisocial behaviour and effortful control in predicting antisocial behaviour in boys.

Monitoring knowledge by frustration by sex. The post hoc test for the monitoring knowledge by frustration by sex interaction revealed that the association between parental monitoring knowledge and adolescent antisocial behaviour varied by levels of frustration for both girls and boys. For girls, monitoring knowledge had a non-significant relation with antisocial behaviour when frustration was low ($\beta = -.00$, $sr^2 = .00$, $p = .991$) but a significant relation with antisocial behaviour when frustration was high ($\beta = -.20$, $sr^2 = .01$, $p = .012$), so that low monitoring knowledge was associated with high levels of antisocial behaviour when frustration was high. For boys, the reverse moderating effect of frustration was true. In their case, monitoring knowledge had a significant relation with antisocial behaviour when frustration was low ($\beta = -.22$, $sr^2 = .01$, $p = .011$), so that low monitoring knowledge was associated with high levels of antisocial behaviour when frustration was low, but there was a non-significant relation with antisocial behaviour

when frustration was high ($\beta = .02, sr^2 = .00, p = .875$). See Figure 4 for a depiction of the interaction.

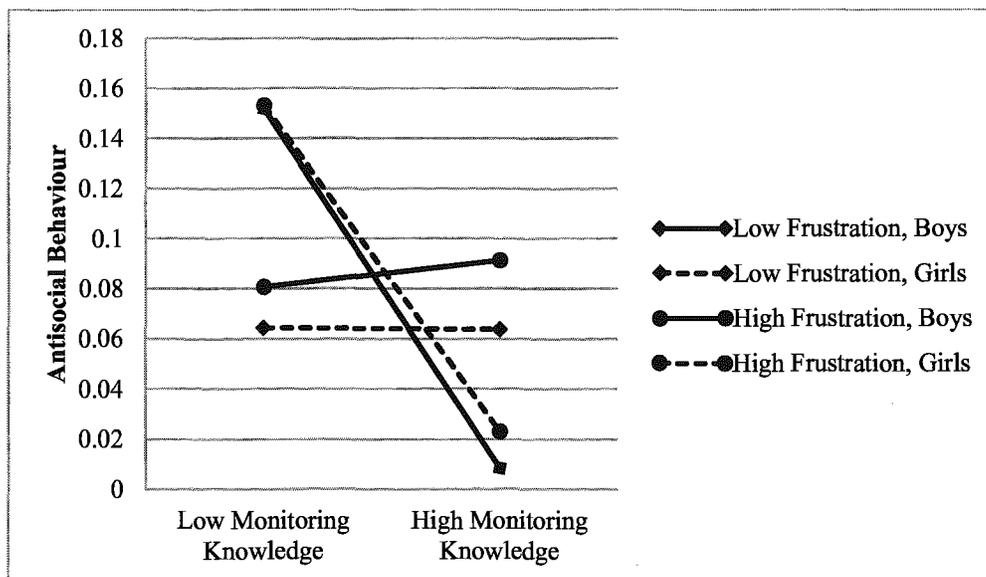


Figure 4. The interaction between parental monitoring knowledge and frustration and sex when predicting adolescent antisocial behaviour.

After plotting the simple slopes for this interaction, it was decided to conduct the follow up regression using frustration as the predictor, and monitoring knowledge and sex as the moderators. This follow up test revealed that frustration related significantly to antisocial behaviour at different levels of monitoring knowledge for girls but not for boys. For girls, frustration had a non-significant relation with antisocial behaviour when monitoring knowledge was high ($\beta = .06, sr^2 = .00, p = .412$), but frustration had a small but significant relation with antisocial behaviour when monitoring knowledge was low ($\beta = .26, sr^2 = .01, p = .004$). The pattern was such that when monitoring knowledge was low for girls, low frustration was associated with lower levels of antisocial behaviour and high frustration was associated with higher levels of antisocial behaviour. For boys, the relation between frustration and antisocial behaviour did not differ by level of monitoring

knowledge (low $\beta = -.07$, $sr^2 = .00$, $p = .416$; high $\beta = .16$, $sr^2 = .00$, $p = .131$), and it was non-significantly associated in both cases. The interaction is displayed in Figure 5.

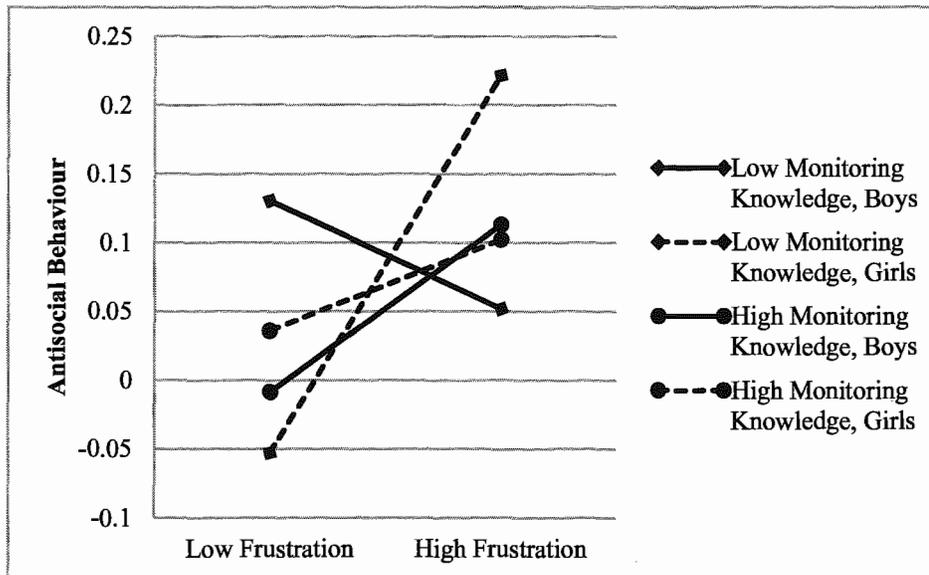


Figure 5. The interaction between adolescent frustration and monitoring knowledge and sex when predicting adolescent antisocial behaviour.

Friends' antisocial behaviour by age. The post hoc test for this interaction revealed that the relation between friends' antisocial behaviour and adolescent antisocial behaviour was significant at both high ($\beta = 2.32$, $sr^2 = .04$, $p < .001$) and low ($\beta = 2.69$, $sr^2 = .04$, $p < .001$) values of age. Consequently, the follow-up analyses of this interaction were re-conducted with age as the predictor and friends' antisocial behaviour as the moderator. This follow-up test revealed that age was significantly related to antisocial behaviour, accounting for approximately 7% of the variance ($\beta = -.42$, $sr^2 = .07$, $p < .001$), when friends' antisocial behaviour was high, whereas when friends' antisocial behaviour was low, age did not significantly relate to antisocial behaviour ($\beta = -.06$, $sr^2 = .00$, $p = .289$). More specifically, the plot indicated that in the condition of high friends' antisocial behaviour, younger age was associated with higher levels of self-reported

antisocial behaviour and older age was associated with lower levels of antisocial behaviour. The plot of these simple slopes is in Figure 6.

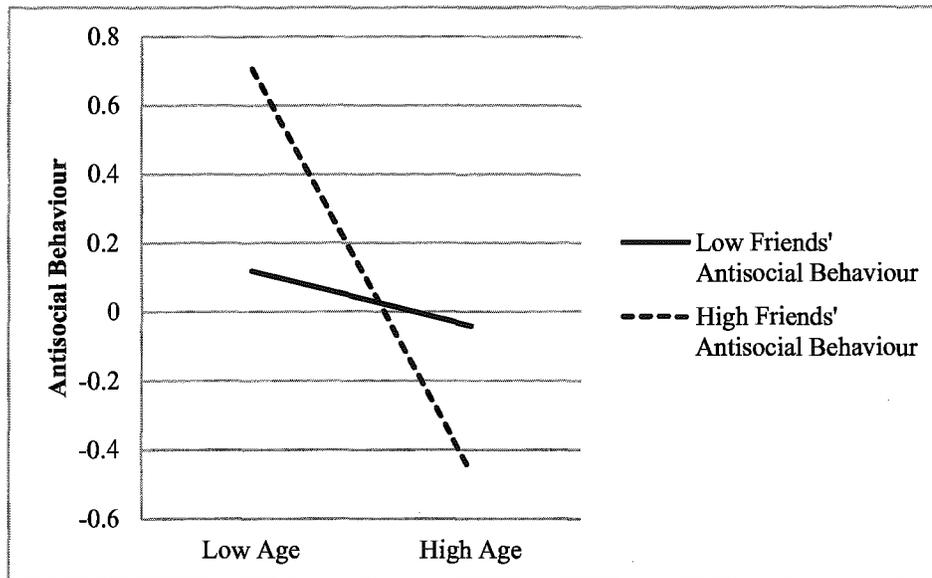


Figure 6. The interaction between age and friends' antisocial behaviour when predicting adolescent antisocial behaviour.

Discussion

Overall, the results of the present study were broadly consistent with the general proposition that the relation of authoritative parenting and friends' antisocial behaviour to adolescent antisocial behaviour would depend partly on the role of temperament. In particular, the findings supported the hypothesis that high levels of parental monitoring knowledge would reduce the risk of involvement in antisocial behaviour for those youth low in effortful control, and though unanticipated, this proved also to be true for girls high in frustration proneness. Although friends' antisocial behaviour did not turn out to be more strongly associated with antisocial behaviour amongst youth who were relatively fearless or high in surgency, this link was magnified specifically in female participants who were low in effortful control and the link between age and antisocial behaviour was

stronger when friends' antisocial behaviour was high. Finally, as anticipated, relatively fearless adolescents were more apt to be involved in antisocial behaviour. However, results did not support the hypothesis that this relation would be attenuated by a high degree of acceptance-involvement in the parent-child relationship. Finally, results were not consistent with the expectation that fearlessness would moderate the effects of parental monitoring knowledge.

Moderating Role of Effortful Control in Relation to Monitoring Knowledge

Evidence was found to support the hypothesis that monitoring knowledge would help offset individual deficits in effortful control, in that adolescents low in effortful control engaged in lower levels of antisocial behaviour when parental monitoring knowledge was high, and conversely a greater degree when monitoring knowledge was low. This suggests that, for adolescents with low self-regulative abilities such as effortful control, parental monitoring knowledge was a form of external behaviour regulation in minimizing adolescent engagement in antisocial behaviour. For example, monitoring knowledge can afford parents the opportunity to regulate curfew and to limit a child's involvement in unsupervised peer activities (Gray & Steinberg, 1999). Thus, there may be fewer opportunities for a dysregulated child to get into trouble, particularly with antisocial peers. Because parental knowledge is strongly predicted by voluntary adolescent disclosure (Willoughby & Hamza, 2011), and because the current study found monitoring knowledge and effortful control to be significantly positively related, another explanation of the interaction is that children with poor effortful control may not self-disclose their inappropriate behaviour to parents (Stattin & Kerr, 2000). Thus, some parents may have little knowledge concerning their adolescents' activities, and therefore

may have limited ability to influence their adolescents' behavioural choices. This could help explain the relation to higher levels of antisocial behaviour among such youth.

Importantly, these results closely replicate the pattern of findings reported by Karreman et al. (2009) who found that parental positive control, a composite measure of limit-setting and provision of structure, buffered the risk of externalizing problems associated with low effortful control in their study of young children between 3 and 4.5 years of age. The current study extends this finding by studying an older age group, yet uses a different parenting measure, rendering the findings connected insofar as they both tap behavioural control. They differ in that positive control pertains to more hands-on discipline and prohibition tactics, whereas monitoring knowledge involves a more indirect process of control.

As well, the current finding extends a previous finding in the aggression literature that parental monitoring knowledge was moderated by child activity level (an aspect of poor self-regulation) in predicting aggression (Colder et al., 1997). The outcome measure of the current study goes beyond the measure of aggression used by Colder et al. (1997) to include violence, vandalism, and theft, and the temperament moderator, activity level, is similar to, but not equivalent to, the temperament trait, effortful control, that was used in the current study.

Moderating Role of Effortful Control in Relation to Friends' Antisocial Behaviour

Contrary to what was expected, low fearfulness and high surgency did not amplify the relation between friends' antisocial behaviour and adolescent antisocial behaviour. Instead, the results generally indicated that the relation varied in accordance with individual differences in the ability to self-regulate through cognitive strategies like

effortful control, rather than through emotional reactivity processes like surgency and fearfulness. Indeed, for girls, friends' antisocial behaviour was a more powerful predictor when effortful control was low. Based on these findings, the prediction that the balance of emotional reactivity between approach-avoidance motivations, governed by reactive control processes, would modify the association between friends' antisocial behaviour and antisocial behaviour in adolescents was not supported. Rather, at least for girls, it was the ability to self-regulate that helped reduce the risk associated with friends' antisocial behaviour. Perhaps because effortful control can affect an individual's weighing of positive and negative consequences, this self-regulative capability may diminish the extent to which adolescents' decision making is swayed by the influence of antisocial friends.

This result relates generally to a previous finding that impulsivity, or a measure of executive control, at age 5, moderated the relation between peer deviancy training and externalizing behaviour measured at 9 years of age (Snyder et al., 2010). In the current study, however, the relation between friends' antisocial behaviour and adolescent antisocial behaviour varied at different levels of effortful control, to a greater extent for girls than it did for boys. This finding extends previous research by revealing a similar interaction in an adolescent population, a period in which important changes in the self-regulation of approach behaviours such as antisocial conduct occur. Indeed, Ernst and Fudge (2009) proposed that the risk-taking behaviour in adolescence could be explained by an inability to balance or modulate the behavioural approach and avoidance systems. Additionally, in a recent study by Rao, Sidhartha, Harker, Bidesi, Chen, and Ernst (2011),

it was found that impulsivity and novelty-seeking traits in adolescents were positively correlated with substance-related problems and risk-taking behaviour.

A possible explanation for the sex-related differences in the interaction between effortful control and friends' antisocial behavior may be what Loeber and Keenan (1994) have described as the "gender paradox of comorbidities". Although the typical rate of conduct problems observed among boys and girls shows that externalizing and conduct problems are more common in boys than girls, girls with conduct problems are more likely to experience comorbidity with internalizing problems like depression and anxiety than their male counterparts. Generally speaking, girls tend to be more nurturing, empathic, and sensitive to others than are boys, thus placing girls high in antisocial behaviour at greater risk for experiencing internalizing problems (Zahn-Waxler, Shirtcliff, & Marceau, 2008).

Given that one of the primary activities of effortful control is inhibiting dominant responses to activate subdominant ones, girls who are strong in this capability are probably more likely than girls who are low in effortful control to "stop and think" about the negative consequences their actions might have on others. In so doing, girls who are high in effortful control are able to recognize the deleterious impact that antisocial behavior may have on their own mental and emotional well-being, and therefore may be more apt to refrain from engaging in behaviours like vandalism, theft, and aggression even if their peers are engaging in similar, deviant acts. Accordingly, effortful control may protect girls from the risk of association with deviant peers. In contrast, male adolescents with good effortful control may reflect on the consequences of their actions more than those with weaker self-regulation abilities, however, they may view the

benefits as greater than the costs and engage in antisocial behaviour anyway. Given that they are thought to be less sensitive and empathetic toward their victims than are their female counterparts, and less likely to experience internalizing problems due to their participation in antisocial behavior, they may place greater value on friends' reinforcement than on the negative consequences of their actions. Thus, good effortful control may be less of a buffer against antisocial behaviour to male adolescents whose friends are highly engaged in delinquent behaviour.

Lastly, previous research has shown that physical aggression and displays of strength are associated with adaptive outcomes such as social status and dating opportunities for male adolescents (Buss, 1988; Volk, Camilleri, Dane, & Marini, in press), whereas this type of aggression is less normative for female adolescents (Crick, Bigbee, & Howes, 1996; Leenars, Dane, & Marini, 2008), and consequently associated with greater psychosocial maladjustment (Crick, 1997). Therefore, whereas female adolescents with good effortful control may inhibit antisocial behaviour, appraising the costs as higher than the benefits, male adolescents with good effortful control may come to the opposite conclusion, viewing the benefits of aggressive behaviour as ample justification for taking the risk of being involved in delinquent activities.

Moderating Role of Frustration on Monitoring Knowledge for Girls

For girls, low monitoring knowledge was significantly related to higher levels of antisocial behaviour when frustration was high. When frustration was the predictor and monitoring knowledge was the moderator, high frustration in girls was significantly related with higher levels of antisocial behaviour when monitoring knowledge was low. This finding bears some similarity to an interaction reported by Stice and Gonzales

(1998), wherein lower levels of negative affectivity, specifically, irritation and anger, strengthened the relationship between parental control and adolescent substance use. The current finding, however, goes in the opposite direction for girls, and indicates that monitoring knowledge is a parental factor that may protect temperamentally vulnerable female adolescents from getting involved in antisocial behaviour.

Apart from this conditional effect, however, there was a lack of evidence that frustration proneness increased the risk of engaging in antisocial behaviour as a form of externalizing coping. It was not significant at the main effect level, nor did it interact with psychological autonomy granting as expected. Moreover, this sex-specific interaction with monitoring knowledge was contrary to my expectations regarding externalizing coping, as it applied to girls rather than boys, who are more prone to externalizing coping and behaviour (Van Hulle et al., 2007). Despite being inconsistent with this sex-specific hypothesis, the finding suggests that monitoring knowledge may provide a buffer against antisocial behaviour for temperamentally vulnerable girls. It may be that external regulation limits exposure to situations, including unsupervised contact with antisocial friends, in which frustration-prone female adolescents might encounter opportunities or social reinforcement contingencies that would otherwise increase the likelihood of involvement in antisocial behaviour.

Adolescent Age Matters when Friends' Antisocial Behaviour is High

Also, it was found that the relation between age and antisocial behaviour varied at different levels of friends' antisocial behaviour. The relation was significant when friends' antisocial behaviour was high but non-significant when friends' antisocial behaviour was low. Amongst adolescents whose friends were high in antisocial

behaviour, younger adolescents were more antisocial than were older ones. Based on this result, it seems that younger adolescents are particularly at risk when they have antisocial friends, perhaps because of deviancy training (Dishion et al., 1996). Conversely, older adolescents with antisocial friends may be at less risk because of the developmental trend that as adolescents get older, they become more resistant to peer influence, even if they affiliate with deviant peers. In support of this, Monahan et al. (2009) found in a large sample of 14 to 22 year old juvenile offenders that antisocial behaviour significantly declined during adolescence and that resistance to peer influence increased during adolescence. Theoretically, this may be due to differences in the timing of brain maturation, because the ventro-medial prefrontal cortex which is responsible for modulating avoidance and approach systems has the longest protracted period of maturation compared to the amygdala and striatum structures which mature earlier in development (Ernst & Fudge, 2009). In fact, Ernst and Fudge (2009) reported that the gradual development of the PFC reflects the improvements in self-regulation observed as individuals progress through childhood into adolescence and into adulthood.

Fearfulness was not Attenuated by Parental Acceptance-Involvement

One of the main effect findings of the current study was that fearfulness was significantly negatively related with antisocial behaviour. This finding is consistent with previous reports that callous-unempathic traits (i.e., characteristically low guilt-related empathy and low fearfulness) predicted membership in a subgroup of adolescents who participated in severe and stable patterns of antisocial behaviour (Frick & White, 2008). Furthermore, reactive control as defined by fear and distress upon the threat of

punishment is yet another process whereby fearfulness may negatively relate to antisocial behaviour (Valiente et al., 2003).

However, contrary to my predictions regarding a moderation effect, fearfulness was not offset by parental acceptance-involvement. Differences between the present research and Kochanska's (2002) research in which a positive parent-child relationship was a significant predictor of internalized values and prosocial behaviour for fearless children, may shed light on why this hypothesis was not supported. More specifically, differences in the age groups and developmental periods studied may help explain the lack of support for this hypothesis, due to the fact that Kochanska's work primarily involved young children whereas the sample of the current study was comprised of adolescents. Accordingly, the increase in time spent with peers during the transition from childhood to adolescence means that adolescents are exposed to the modeling and reinforcement of both peers and parents, thus weakening the relative importance of pleasing one's parent. Additionally, Kochanska's (2002) work focused on behavioral manifestations of conscience development including moral emotions, conduct, and cognition, whereas the current study focused on antisocial behaviour per se. In Kochanska's (2002) work, behavioural indicators of impaired conscience development, such as giving into coaxing to break various rules or standards of behaviour when not under parental surveillance, were less extreme in nature than are stealing, vandalizing, and violence. These differences may, too, partly account for the discrepant results.

Fearfulness did not Moderate the Link between Monitoring Knowledge and Antisocial Behaviour

Contrary to what was hypothesized, the protective effect of parental monitoring knowledge was not stronger for fearful adolescents. One reason for this might be that the

monitoring variable of this study did not explicitly tap discipline strategies, for instance, grounding or privilege removal, that could be used by parents to respond to transgressions. Perhaps parent-child interactions of this sort would be moderated to a greater extent by adolescent fearfulness, insofar as they make explicit reference to punishment. Also, even though Colder et al. (1997) found that fearful boys who were harshly disciplined exhibited high levels of aggression, it is quite possible that the lack of an interaction between fearfulness and monitoring knowledge in relation to antisocial behaviour in the current study may be due to differences in the nature of behavioural control under examination.

Conclusions

The findings of the current study provide some support for the hypothesis that the relation of parent and peer factors to antisocial behaviour would be moderated by adolescent temperament. More specifically, the findings indicated that effortful control was a particularly important moderator, modulating the association of both monitoring knowledge and friends' antisocial behaviour with adolescent antisocial behaviour. In contrast, apart from the monitoring knowledge by frustration by sex interaction, there was little evidence that the relations between antisocial behaviour and parenting or friends' antisocial behaviour were moderated by variations in reactivity due to fearfulness, frustration, or surgency, as the predictions that pertained to interactions involving temperamental reactivity were not supported. This might imply that variations in cognitive control processes involved in inhibiting antisocial behaviour are more likely to modulate relations of parenting or peer factors with adolescent antisocial behavior than are individual differences in emotional reactivity to environmental stimuli. Having said

that, it is important to note that some findings suggested temperamental reactivity played a role, as relatively fearless youth were more likely to engage in antisocial behavior, and frustration-prone female adolescents were less likely to participate in antisocial behavior when monitoring knowledge was high.

In the current study, friends' antisocial behaviour was more strongly related to antisocial behaviour in comparison to any of the authoritative parenting dimensions, a finding that corresponds with the fact that adolescence involves a dramatic shift in reference group orientation from parents to peers (Gecas & Seff, 1990). Therefore, these results could be due in part to an increase in the amount of time spent with peers in unsupervised activities, and in part to a relative decline in the amount of time spent with parents.

In terms of temperament, effortful control and fearfulness were stronger and more consistent predictors of antisocial behaviour than were frustration and surgency, suggesting that temperament variables pertaining to self-regulation – effortful and reactive control – have larger associations with antisocial behaviour than temperament variables pertaining to approach-oriented predispositions – frustration and surgency.

Implications

Given the prevalence of antisocial behaviour in adolescence, and the deleterious outcomes with which it is often associated, the findings of the current study present important implications for parents, educators, mental health practitioners and the like. Primarily, the results indicated that some adolescents are temperamentally vulnerable to engaging in antisocial behaviour, affording invested adults and caregivers the knowledge necessary to identify those adolescents whom might be at greater risk and to

appropriately tailor parenting, teaching, and counselling approaches to the unique and individual needs of the adolescent.

More particularly, given the findings linking effortful control to antisocial behaviour at a main effect level, and as a moderator of parenting and peer factors, parenting strategies and psychosocial interventions that may increase self-regulation abilities may help to reduce risk of involvement in antisocial behaviour, at least for girls who experience peer pressure from antisocial friends. For instance, Zhou et al. (2008) found that authoritative parenting and effortful control were negatively related to externalizing problems, such as rule-breaking and aggression. Furthermore, Riggs, Greenberg, Kusché, and Pentz (2006) reported that the Promoting Alternative Thinking Strategies (PATH) program for developing social-emotional skills was an effective school-based curriculum in the prevention of aggressive and disruptive behaviour problems in school-aged children. Specifically, Riggs et al. (2006) found that posttest measures of inhibitory control were higher for children in the treatment group who participated in the PATH program than for children who were in the control group. Importantly, these researchers also found that inhibitory control was negatively related to teacher reports of externalizing problems one year later.

Also, given the finding from the current study that effortful control moderated the relation between monitoring knowledge and antisocial behaviour, as well as the finding from Colder et al. (1997) that self-regulation moderated the relation between monitoring knowledge and aggression, it seems advisable for parents to provide external regulation for adolescents who are poorly self-regulated so as to limit their exposure to people and situations which might encourage antisocial behaviour. In support of this, Webster-

Stratton (2006) has outlined the success of the BASIC intervention program in treating children with conduct problems. The program teaches parents how to build a strong parent-child relationship and how to use “specific nonviolent, discipline techniques” to develop emotional regulation abilities in children (Webster-Stratton, 2006, p.163).

Strengths and Limitations

The current study design was cross-sectional in nature which may be viewed as a methodological limitation in that it was not possible to demonstrate causal effects this way. Furthermore, the study employed a sample that was limited in ethnic diversity which may limit the generalizability of the results. There may have been a selection bias with respect to the types of mothers who consented to participate in the current study, in the sense that the average levels of monitoring knowledge and acceptance-involvement were quite high and the corresponding standard deviation values were quite low. Restricted range and variability may have impacted the predictive strength of certain parenting variables, thereby constraining their ability to significantly interact with temperament in relating to antisocial behaviour. And in fact, some of the interaction effect sizes seemed to be low, although they were statistically significant. Finally it is possible that the friends’ antisocial behaviour measure was confounded by popularity, in that individuals who do not have very many friends overall are probably less likely to have antisocial friends at all.

Nonetheless, the study had several strengths including a relatively large sample size, as well as data collected from both parent and child informants, thereby improving the validity of the measures. Additionally, the method of recruitment required a distribution of families that was proportionate to the numbers of families residing in each

of the areas that were sampled. This approach should have minimized the effects of selection biases and helped achieve a sample that was representative of the diverse ethnicities and socioeconomic statuses of the families within the region. Finally, the current study replicated many main effects that have been found in previous studies, and provided evidence for the moderating role of self-regulatory temperament traits.

Directions for Future Research

Future research in this area would benefit from using a longitudinal design so that more inferences can be made about causal direction, and potentially, to differentiate life-course persistent from adolescent-limited antisocial behaviour (Moffitt, 1993; Odgers et al., 2008). Furthermore, growth curve analyses could be used to determine whether parenting (e.g., Patterson et al., 1989), peer (e.g., Monahan et al., 2009) or temperament factors are related to deviations from the normative developmental trajectories of antisocial behaviour. It would also be of interest to study whether parenting, peer, or temperament factors are differentially related with overt and covert types of antisocial behaviour (Loeber, 1985). In addition, the significant patterns that emerged in the current study could be tested in a clinical sample to see if the findings could be replicated in a group of adolescents who are higher in antisocial behaviour than the adolescents that comprised the current sample, who were predominantly low in antisocial behaviour, and whose antisocial behaviour was not necessarily severe enough to warrant clinical attention.

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Appendices

Appendix A

Demographic Information

1. How old are you? _____ years old
2. Are you male or female? Male Female
3. What grade are you in? Grade: _____
4. Who do you live with the most?
 - With my mother and my father With my father and his partner
 - With a foster family With my mother and her partner
 - With my father only With my mother and my stepfather
 - With my mother only With my father and my stepmother
 - No one Other: _____
5. How many brothers and sisters do you have? (include half-brothers and half-sisters) _____ Brothers _____ Sisters

Appendix B

Early Adolescent Temperament Questionnaire – Revised

How “true” is each statement for you?

1. It is easy for me to really concentrate on homework problems.
2. When someone tells me to stop doing something it is easy for me to stop.
3. I do something fun for a while before starting my homework, even when I’m not supposed to.
4. I wouldn’t like living in a really big city, even if it was safe.
5. It bothers me when I try to make a phone call and the line is busy.
6. The more I try to stop myself from doing something I shouldn’t, the more likely I am to do it.
7. Skiing fast down a steep slope sounds scary to me.
8. If I have a hard assignment to do, I get started right away.
9. I get frightened riding with a person who likes to speed.
10. I find it hard to shift gears when I go from one class to another at school.
11. I worry about my family when I’m not with them.
12. I get very upset if I want to do something and my parent(s) won’t let me.
13. When trying to study, I have difficulty tuning out background noise and concentrating.
14. I finish my homework before the due date.
15. I worry about getting into trouble.
16. I am good at keeping track of several different things that are happening around me.
17. I would not be afraid to try a risky sport, like deep sea diving.
18. It’s easy for me to keep a secret.
19. Some kids/teens, who push people and throw their stuff around, make me nervous.
20. I get irritated when I have to stop doing something that I am enjoying.
21. I wouldn’t be afraid to try something like mountain climbing.
22. I put off working on projects until right before they’re due.
23. I worry about my parent(s) dying or leaving me.
24. I enjoy going places where there are big crowds and lots of excitement.
25. It really annoys me to wait in long lines.
26. I feel scared when I enter a darkened room at home.
27. I pay close attention when someone tells me how to do something.
28. I get very frustrated when I make a mistake in my school work.
29. I tend to get in the middle of one thing, then go off and do something else.
30. It frustrates me if people interrupt me when I’m talking.
31. I can stick with my plans and goals.
32. I get upset if I’m not able to do a task really well.

Note. The effortful control subscale was comprised of items 1, 2, 6, 7, 8, 10, 13, 14, 16, 18, 22, 27, 29, and 31. The frustration subscale was comprised of items 5, 12, 20, 25, 28, 30, and 32. The fearfulness subscale was comprised of items 9, 11, 15, 19, 23, and 26. The surgency subscale was comprised of items 3, 4, 17, 21, and 24.

Appendix C

Authoritative Parenting Measure

Think about your mother/stepmother (or female guardian) who you live with the most and answer these questions.

1. I can count on her to help me out.
2. She tells me that I shouldn't argue with adults.
3. She keeps pushing me to do my best in whatever I do.
4. She tells me that I should give in on arguments rather than make people angry.
5. She keeps pushing me to think for myself.
6. When I get a poor grade in school, she makes my life miserable.
7. She helps me with my schoolwork if there is something I don't understand.
8. She tells me that her ideas are correct and that I should not question them.
9. When she wants me to do something, she explains why.
10. Whenever I argue with her, she says things like, you'll know better when you grow up.
11. When I get a poor grade in school, she encourages me to try harder.
12. She lets me make my own plans for things I want to do.
13. She knows who my friends are.
14. She acts cold and unfriendly if I do something she does not like.
15. She spends time just talking with me.
16. When I get a poor grade in school, she makes me feel guilty.
17. We do fun things together.
18. She won't let me do things with her when I do something she does not like.
19. How much does your mother/stepmother (or female guardian) ask you about...
 - a) where you go at night?
 - b) what you do with your free time?
 - c) where you are most afternoons after school?
20. How much does your mother/stepmother (or female guardian) really know...
 - a) where you go at night?
 - b) what you do with your free time?
 - c) where you are most afternoons after school?

Note. Psychological autonomy granting items were all even-numbered items excluding item 20 and were all reverse-scored except for item 12. Acceptance-involvement items were all odd-numbered items excluding item 19. Monitoring knowledge items were items 19 and 20.

Appendix D

Peer Delinquency Scale

In the past year, how many of your close friends have...

1. Skipped school without an excuse?
2. Purposely damaged or destroyed property that did not belong to them?
3. Stolen something worth less than \$25?
4. Stolen something worth more than \$25?
5. Gone into or tried to go into a building to steal something?
6. Hit someone with the idea of hurting that person?
7. Used alcohol?

Appendix E

Self-Reported Delinquency Questionnaire

In the past year, how often have you done the following?

1. Purposely broken or destroyed musical instruments, sports equipment or other school equipment?
2. Taken and kept any school property worth \$10 or more?
3. Taken and kept something from a store without paying?
4. Threatened to hit someone or to force them to do something they didn't want to do?
5. Taken part in fights between groups of youth (gangs)?
6. Purposely broken or destroyed something that didn't belong to you?
7. Taken and kept something worth less than \$10, that didn't belong to you?
8. Bought or sold something you knew was stolen?
9. Entered a place where you were not allowed?
10. Taken and kept something worth between \$10 and \$100 that didn't belong to you?
11. Gone without paying to a place where you should have paid? (movie theatre, concert, sports event?)
12. Used a weapon (stick, knife, gun, rocks) in fighting with someone else?
13. Purposely broken or destroyed something belonging to your parents or another family member?
14. Taken money from the house without permission, or without the intent of saying anything?
15. Carried a weapon (chain, knife, gun, etc.)?
16. Started a fire in a store or elsewhere?
17. Thrown rocks, bottles or other objects at someone?
18. Hit someone who hadn't done anything?
19. Had a fist fight with anyone?

Note. The vandalism subscale consisted of items 1, 6, 13, and 16. The theft subscale consisted of items 2, 3, 7, 8, 9, 10, 11, and 14. The violence subscale consisted of items 4, 5, 12, 15, 17, 18, and 19.

Appendix F

Ethics Approval

Deborah Van Oosten. 07:36 .../2003 -0400, REB 02-286, Dane et al. - Accepted as clarifie Page 1 of 3

X-Sender: dvanooost@spartan.ac.brocku.ca
 X-Mailer: QUALCOMM Windows Eudora Version 5.2.0.9
 Date: Mon, 28 Apr 2003 07:36:43 -0400
 To: adane@brocku.ca, jeffrey.derevensky@mcgill.ca, jmcphee@brocku.ca,
 lroot@nadas.on.ca
 From: Deborah Van Oosten <deborah.vanoosten@brocku.ca>
 Subject: REB 02-286, Dane et al. - Accepted as clarified
 Cc: engemann@ed.BrockU.CA, mowen@spartan.ac.brocku.ca
 X-Spam-Status: No, hits=0.9 required=8.0
 tests=AWL_EXTRA_MPART_TYPE,MIME_LONG_LINE_QP,SPAM_PHRASE_02_03,

WEB_BUGS
 version=2.43-brock-1.01

Senate Research Ethics Board

Extensions 3943/3035, Room AS 302

DATE: April 28, 2003

FROM: Joe Engemann, Chair

Senate Research Ethics Board (REB)

TO: Andrew Dane, Psychology
 Jeffrey Derevensky, McGill University
 Jennifer McPhee, Community Health Sciences
 Lisa Root, Problem Gambling Program

FILE: 02-286, Dane/Derevensky/McPhee/Root

TITLE: Parental Socialization of Youth Gambling

DECISION: Accepted as clarified.

This project has been approved for the period of **April 28, 2003 to January 30, 2004** subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The approval may be extended upon request. *The study may now proceed.*

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and approved by the REB. The Board must approve any modifications before they can be implemented. If you wish to modify your research project, please refer to www.BrockU.CA/researchservices/forms.html to complete the appropriate form **REB-03 (2001) Request for Clearance of a Revision or Modification to an Ongoing Application.**

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects, with the exception of undergraduate projects, upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form **REB-02 (2001) Continuing Review/Final Report** is required.

Please quote your REB file number on all future correspondence.